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SIEMENS

OpennessScripter: Introduction

TIA Portal / Openness API

<https://support.industry.siemens.com/cs/ww/en/view/109742322>

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1 Introduction

This **introduction** gives you a brief insight into the OpennessScripter.

NOTE

The **detailed documentation including the command set** can be found in the OpennessScripter menu "Help".

1.1 The TIA Portal programming interface

The TIA Portal Openness API (Application Programming Interface) provided by TIA Portal allows you to automate recurring steps in your projects. This is useful as manual adjustments in projects involve a high susceptibility to errors. Moreover, this automation allows you to save time, enabling you to work more efficiently.

Note

Using the interfaces incorrectly can result in loss of data and production downtime.

1.2 Application examples

The interface provides the user with many options for automating actions.

Table 1-1

Action	Scenario
Import and compile program blocks	You can modify reusable programs externally and integrate them into a new project.
Export data	<ul style="list-style-type: none"> Create project statistics and backups based on your own rules. Check programming guidelines using external tools. Match projects to global libraries.
Compare projects	Check the consistency of local projects using an online comparison with the project on the plant.
Generate and import visualizations via exported program structures	Automatically generate the visualization for the HMI from the existing project.

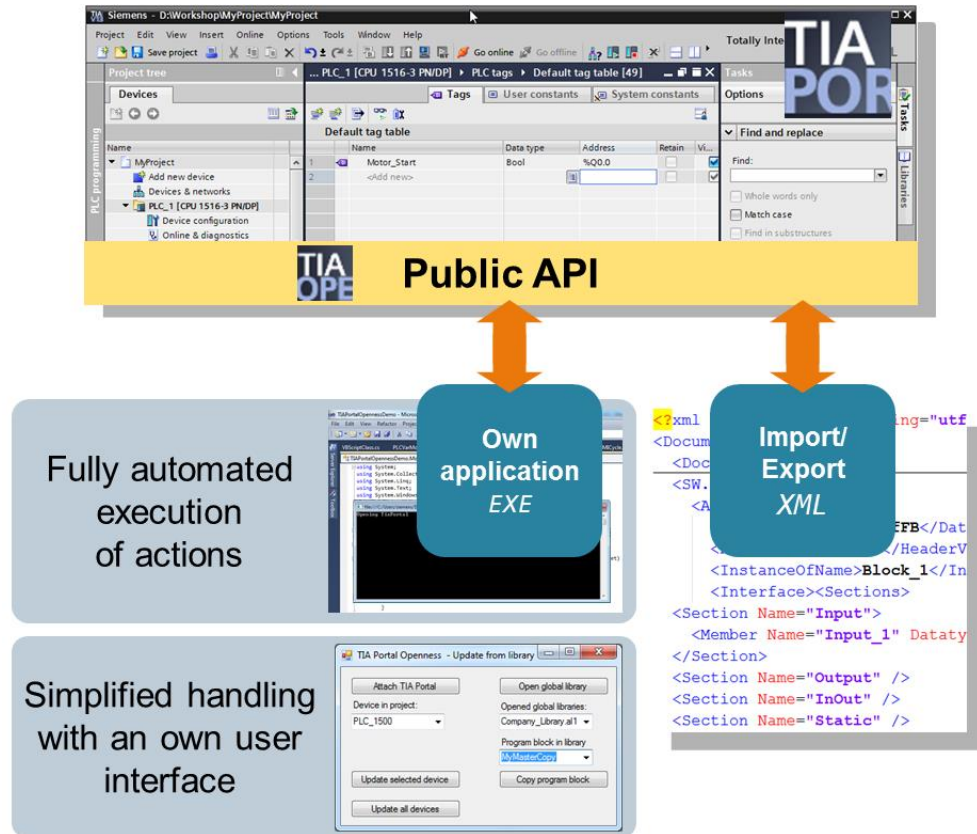
NOTE

Further ready-to-use application examples, partly including source code for own adaptations, can be found on the **Siemens Industry Online-Support topic page "TIA Portal Openness"** [\5\](#).

1.3 Until now: Creation of own applications

Until now, you had to develop an application to use the TIA Portal interface. This required programming skills in a high-level language such as C# or VB.NET.

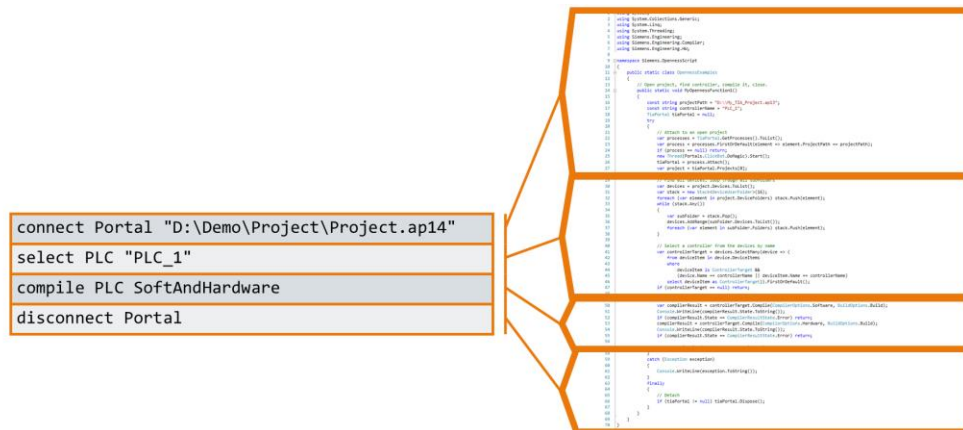
Figure 1-1



1.4 New: Create scripts with OpennessScripter

The OpennessScripter allows you to automate simple tasks in TIA Portal projects without programming skills. Easy script commands allow you to avoid complex programming.

Figure 1-2: Custom application (right) compared to an OpennessScripter script (left)



Instead of programming commands, you use a meta language. This reduces the writing work. In the example shown in Figure 1-2, this results in saving of about 95 % of the pure programming work. This example does not yet include other savings such as incorporation into the high-level language.

1.5 Advantages

Using the OpennessScripter provides several advantages over an in-house development.

Table 1-2

Characteristic	Evaluation
Functionality	The OpennessScripter provides only the basic functionality of the TIA Portal Openness API.
Reliability	When writing a script, the number of potential errors caused by the user is significantly reduced.
Usability	An elegant user interface and commands that are oriented towards English make the OpennessScripter easier.
Efficiency (performance)	No differences regarding execution time.
Changeability	Customizing scripts is considerably easier and quicker than modifying an application developed in a high-level language.
Portability	Scripts are text files and can be transferred more easily. A special development environment is not necessary.

NOTE

Portal Openness in combination with high-level languages (C#, VB.NET) offers **far more possibilities** than this application example "OpennessScripter".

2 Requirements

2.1 Required know-how

- TIA Portal user knowledge (beginner's level)
- No programming skills

2.2 System requirements

- No development environment necessary, e.g., Microsoft Visual Studio.
- The OpennessScripter requires at least the "Microsoft .NET 4.8" runtime. This runtime is provided for free by Microsoft [4](#).
- TIA Portal is not required for writing and checking scripts.
- Running scripts requires that TIA Portal or a product based on TIA Portal be installed, for example STEP 7 Professional or WinCC Professional. In addition, TIA Portal Openness V13 SP1, V13 SP2, V14, V14 SP1, V15, V15.1, V16, V17, V18 or higher must be installed. The installation is described in the System Manual [3](#), Chapter 4.1.2.
- To run scripts, the Windows user must be a member of the local "Siemens TIA Openness" group. The setup is described in the System Manual [3](#), Chapter 4.1.3. More information is also available in the OpennessScripter, "Settings > Local users and groups".
- Whether Windows and TIA Portal are based on 32- or 64-bit versions has no effect on the OpennessScripter.
- The OpennessScripter and TIA Portal must run in the same Windows environment, i.e., on the same Windows PC / the same virtual machine.

NOTE

Please install all available TIA Portal Service Packs and updates.

2.3 Enabler file and usage file

NOTE

Importing blocks and user data types into a PLC device requires the "Enabler-File" and "Usage-File" license files **only for TIA Openness Versions < V14 SP1**.

The enabler file, "SiemensTIAOpennessCustomerID.xml", must be in the program folder of the OpennessScripter:

C:\Program Files (x86)\Siemens\Automation\OpennessScripter\

The usage file, "SiemensTIAOpennessUsage.xml", must be in the PublicAPI folder of TIA Portal:

C:\Program Files (x86)\Siemens\Automation\Portal V13\PublicAPI\

C:\Program Files\Siemens\Automation\Portal V14\PublicAPI\

3 Installation

Setup

A setup is provided for the OpennessScripter. It allows you to install the software on the computer.

In the start menu, a shortcut is created in "Programs > Siemens Automation > OpennessScripter".

During the installation process, you should select the following options:

1. Enter the current Windows user in the local "Siemens TIA Openness" Windows group.
2. Add the application to the TIA Portal Openness whitelist.
3. Perform a system check to check the TIA Portal dependencies.

Uninstalling

You can use Control Panel > "Programs and Features" > "OpennessScripter" to uninstall the software.

Installation of a new version

The setup detects the previous versions of OpennessScripter automatically and uninstalls these before installing the new version.

Sequence

You can install the OpennessScripter, even if TIA Portal and the Openness option package are not installed on your system.

In this case, you can write scripts but not run them.

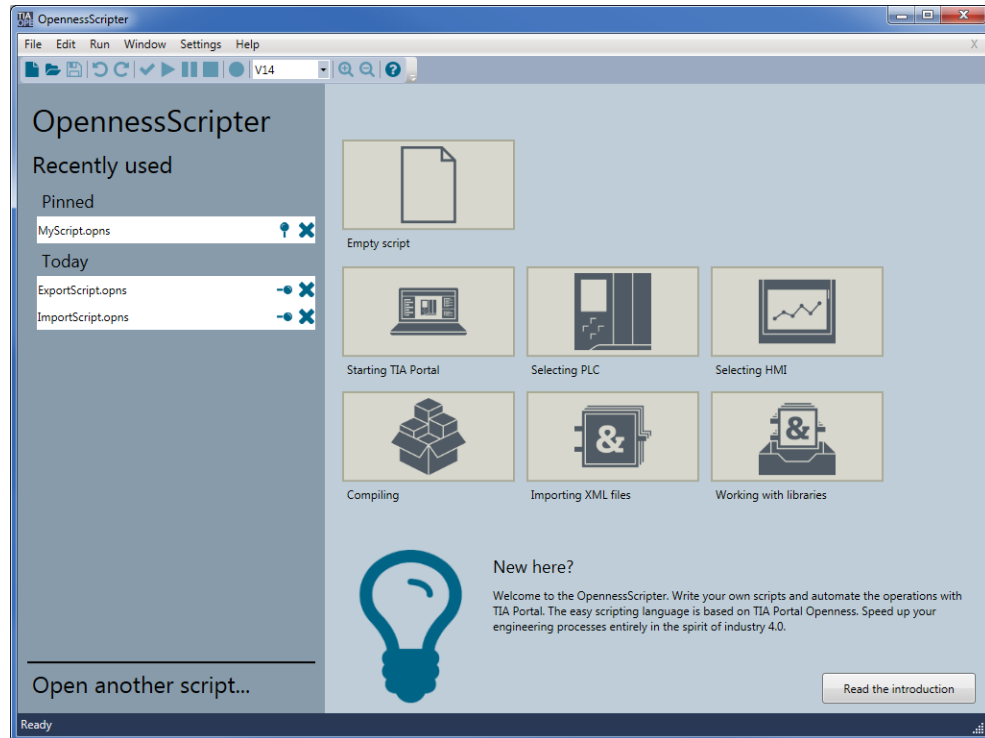
If you install TIA Portal or the Openness option package later, you must manually perform the above steps 1. and 2. or reinstall the OpennessScripter.

4 The first start

4.1 Structure of the start screen

When you start the OpennessScripter, the start screen opens. The left part displays the recently used scripts. In this area, you can also pin scripts using a pin. The right part displays several script templates you base your script on.

Figure 4-1

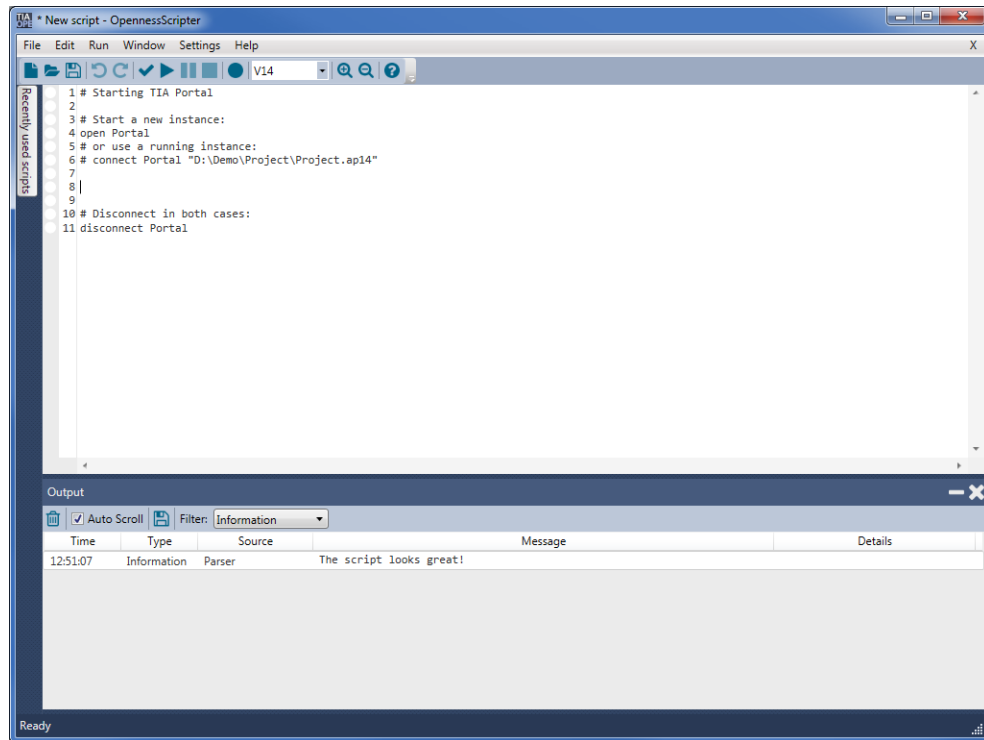


4.2 Structure of the editor

Once you have created a new script, opened a script or selected a template, the Script Editor starts in the same window. A text field where you write the commands line by line takes up most of the user interface. The left part provides a sidebar for the recently used files. The bottom part provides a sidebar for the output. You can change the sidebar sizes and collapse and hide the sidebars.

The "Close" option in the "File" menu takes you to the start screen.

Figure 4-2



4.3 Creating a script

This chapter provides you with insight into the scripting language.

4.3.1 General

Rules

There are three rules for the script commands:

- Each command is in a separate line.
- A comment starts with a "#" and can be at both the start and end of a line.
- Upper/lower-case letters or indenting commands do not affect the script's functionality.

Working with projects

There are **two ways** of working with a TIA Portal project:

Table 4-1

Start a new TIA Portal instance and open the project	Connect to a TIA Portal project that has already been opened
<pre>open Portal open Project "project Path" # Your script code ... close Project disconnect Portal</pre>	<pre>connect Portal "project path" # Your script code ... close Project disconnect Portal</pre>

Note

At the end of the script, disconnect from TIA Portal.
The TIA Portal user interface cannot be terminated automatically.

Command types

The following types of commands exist:

- Command with optional parameters
- Command without parameters
- Hybrids of these two types (for commands with multiple parameters).

Note

If you do not specify optional parameters, defaults will be used.
Use straight quotation marks, for example "name"; do not use smart quotation marks, for example "name".
All defaults and the command set can be found in the detailed documentation (in the OpennessScripter menu "Help").

4.3.2 "Hello World" script

Follow the below instructions to write a script that outputs the text "Hello World".

1. Start the OpennessScripter and click the "Empty script" template. Delete the entire default text in the Editor so that the text field is blank. Write the following new line:
`print "Hello World!"`
2. In the "Run" menu, click the "Run" option to start the script. Keep an eye on the below "Output" window. It displays the output text "Hello World!"
3. You have successfully completed your Hello World script. In the "File" menu, click the "Close" option to return to the start screen.

4.3.3 "Open TIA Portal" script

Follow the below instructions to write a script that opens TIA Portal.

1. Start the OpennessScripter and click the "Empty script" template.
2. The template already contains texts that start with a diamond "#". These texts are comments for your own documentation. Add your name and a description, for example "My first script", to the comment:
`# Description: My first script`
Go to the end of the script and write a new line. Make sure not to enter a diamond "#":
`open Portal`
Insert a line break at the end of the line and write the next line:
`disconnect Portal`
3. In the "Run" menu, click the "Check" option to check the script for errors. Read the information in the output. If the error check finds errors in your script, correct them.
4. In the "File" menu, click the "Save" option to save the script on your computer. The file gets the ".opns" extension.
5. In the "Run" menu, click the "Run" option to start the script. An animated progress bar at the bottom left indicates that the script is currently being executed. No changes are possible during execution. In the OpennessScripter, the specific line that is currently being executed is indicated in color to the left of the line number.
6. The script starts TIA Portal. Depending on the computing power, this step may take some time. The script disconnects from TIA Portal. Please note: This does not terminate TIA Portal. You cannot close the TIA Portal user interface automatically. As soon as the script is done, the status displayed in the bottom left part of the OpennessScripter has returned to "Ready".
7. You have successfully written your first script. In the "File" menu, click the "Close" option to return to the start screen.

5 Examples

5.1 Generating a project

Scenario

After production planning and before engineering: A machine manufacturer produces a series of machines. The manufacturer can use the OpennessScripter as a product configurator and generate projects on an automated basis.

Steps

The individual steps are as follows:

1. Start TIA Portal and open a project
2. Select a controller
3. Create a group for a tag table
4. Import a single tag table
5. Import several program blocks
6. Compile the controller
7. Save and close the project
8. Finally disconnect from TIA Portal

Script

The commands for the script are as follows:

```
# Start TIA Portal and open project
open Portal
open Project "D:\Projects\AssemblyLine\AssemblyLine.apl7"

# Select controller
select Plc "PLC_1"

# Import a single tag table in a subgroup
create PlcTagTableFolder /group1/
import PlcTagTables "D:\Sources\tag tables\tagtable1.xml" /group1/

# Import all program blocks from the file directory
import ProgramBlocks "D:\Sources\program blocks\"

# Compile controller
compile Plc SoftAndHardware

# Save and close project
save Project
close Project

# Disconnect
disconnect Portal
```

5.2 Updating a project

Scenario

During engineering: The user can match and update the blocks used in a project from global libraries on an automated basis.

Steps

The individual steps are as follows:

1. Connect to an already open project in TIA Portal
2. Open a global library
3. Select a controller
4. Update the controller using the global library
5. Close the global library
6. Save the project
7. Finally disconnect from TIA Portal

Script

The commands for the script are as follows:

```
# Reuse an already opened TIA Portal project
connect Portal "D:\Projects\AssemblyLine\AssemblyLine.ap17"

# Open library
open GlobalLibrary "D:\Libraries\LGF\LGF.al17"

# Select controller and update from the global library
select Plc "PLC_1"
update Plc GlobalLibrary

# Close library
close GlobalLibrary

# Save project
save Project

# Disconnect
disconnect Portal
```

6 Appendix

6.1 Service and support

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support.industry.siemens.com/cs/ww/en/sc/2067

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6.2 Links and literature

Table 6-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the entry page of the application example https://support.industry.siemens.com/cs/ww/en/view/109742322
\3\	TIA Portal Openness System Manual (API for automation of engineering workflows) https://support.industry.siemens.com/cs/ww/en/view/109798533 (V17)
\4\	Download: Microsoft .NET Framework 4.8 Runtime (runtime environment) https://dotnet.microsoft.com/download/dotnet-framework/net48
\5\	Topic page: TIA Portal Openness: Automation of engineering workflows https://support.industry.siemens.com/cs/ww/en/view/109792902

6.3 Change documentation

Table 6-2

Version	Date	Modifications
V1.0.0	08/2016	First version
V1.1.0	09/2016	<ul style="list-style-type: none"> • System requirements: License files for user data types • Settings "Local users and groups" • Figure: Editor • Figure: Hello World script • Examples • Installation • System requirements: .NET Framework 4.6.1
V1.1.1	01/2017	<ul style="list-style-type: none"> • Entry ID • Chapter on enabler file and usage file • Uninstalling and installation order

Version	Date	Modifications
V1.1.2	02/2017 04/2017 05/2017 06/2017	<ul style="list-style-type: none">• Examples for TIA Portal V14• Revision of the document• Support for TIA Portal V14 SP1 and V13 SP2 and notes• Copyediting and translation
V1.1.3	01/2018	<ul style="list-style-type: none">• Support for TIA Portal V15 and notes
V1.1.4	10/2018	<ul style="list-style-type: none">• Support for TIA Portal V15.1 and notes
V1.1.5	02/2020	<ul style="list-style-type: none">• Support for TIA Portal V16 and notes
V1.1.6	10/2021	<ul style="list-style-type: none">• Support for TIA Portal V17 and notes• System requirements: .NET Framework 4.8• Notes for working with projects (chapter 4.3)• Revision of the examples (chapter 5)
V1.1.7	02/2023	<ul style="list-style-type: none">• Support for TIA Portal V18 + higher and notes