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Digitalization with TIA Portal: PLM integration of automation engineering

TIA Portal V14 SP1, Teamcenter Gateway

Siemens Industry Online Support

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Table of Contents

1 Introduction

1.1 Overview

1.1.1 Teamcenter

Teamcenter is a PLM platform (product lifecycle management) ensuring the central management of all machine information. This includes mechanical, electrical and other engineering data of a machine. ECAD (electronic computer-aided engineering) and MCAD (mechanic computer-aided engineering) programs can be used for storing your data in Teamcenter. Teamcenter manages all data and compiles them in an overall database of a machine.

Teamcenter is installed on a central server to ensure that all developers of a machine can access the necessary data.

Further information is available at
https://www.plm.automation.siemens.com/en/products/teamcenter/index.shtml
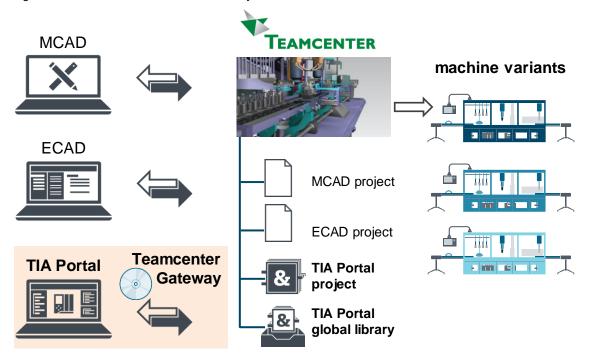
Figure 1-1: Overview

Advantages

- Central data management
- Central storage of engineering data of all machines
    - Mechanical design data
    - Electrical design data
    - Automation data
- Consistent versions of engineering data
- Integral release workflows
- System-supported versioning

1.1.2 Teamcenter Gateway for TIA Portal

Via Teamcenter Gateway, TIA Portal can connect directly to a Teamcenter server. This allows managing projects and global libraries via Teamcenter and editing them in TIA Portal. It is possible to revise, edit and save projects and to link them to PLM processes using Teamcenter workflows. Moreover, with further project information, project versions can be linked to specific library states.

The figure below shows which data are stored in Teamcenter. Different machine variants can be generated from these data records.

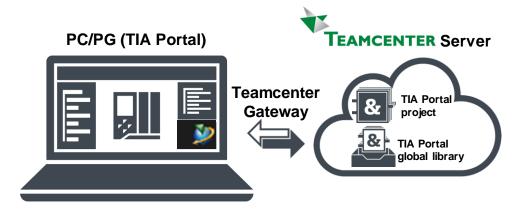Figure 1-2: TIA Portal - Teamcenter Gateway - Teamcenter

Advantages

- User interface integrated into TIA Portal for accessing Teamcenter
- Teamcenter as central storage for TIA Portal projects and global libraries
- In Teamcenter, data are centrally revised and versioned.
- Teamcenter references between a TIA Portal project and all global libraries used for the corresponding project are created automatically.

1.2　Mode of operation

Teamcenter Gateway is integrated seamlessly into TIA Portal upon installation. From TIA Portal, you can establish a direct connection to the Teamcenter server.

Figure 1-3: TIA Portal - Teamcenter Gateway - Teamcenter

Prerequisite

- Teamcenter server
    - Object model (projects, libraries) is installed
    - User accounts are configured
- PC/PG (TIA Portal) has to be connected with the Teamcenter server

1.3 Components used

This application example has been created using the following hardware and software components:

Table 1-1: Components used on PG/PC

Component	Qty.	Article number	Note
STEP 7 Professional V14 SP1 update 2	1	6ES7822-1AE04-0YA5 or 6ES7822-1AA04-0YA5	Download DVD
TIA Portal Teamcenter Gateway V14 SP1 update 1	1	6ES7823-1EE00-0YA5 or 6ES7823-1EA00-0YA5	Download DVD
Teamcenter Rich Application Client (RAC)	1	-	Alternative: Teamcenter Client Communication System (TCCS) version 11.2

Note	Further information on system requirements are available in the TIA Portal help in "Editing projects > TIA Portal Teamcenter Gateway > System requirements".

Additionally, a Teamcenter server is required.

This application example consists of the following components:

Table 1-2: Documentation

Component	File name	Note
Documentation	109749107_Teamcenter_Gateway_DOC_v10_en.pdf	-

2 Engineering

This chapter describes how to edit TIA Portal projects and global libraries using a Teamcenter server.
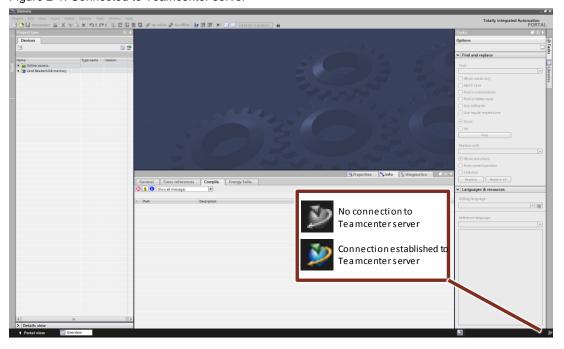
Note	For more information refer to the help of the TIA Portal in "Editing projects > TIA Portal Teamcenter Gateway".

2.1 Checking the connection between TIA Portal and the Teamcenter server

After installation of Teamcenter Gateway, the following icons will be shown in the TIA Portal.
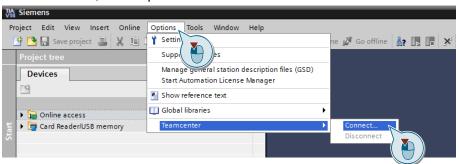
Figure 2-1: Connected to Teamcenter server

In general, you can see on the bottom right in the TIA Portal by means of the Teamcenter icon whether the TIA Portal is connected to the Teamcenter server.

2.2 Establishing a connection to the Teamcenter server

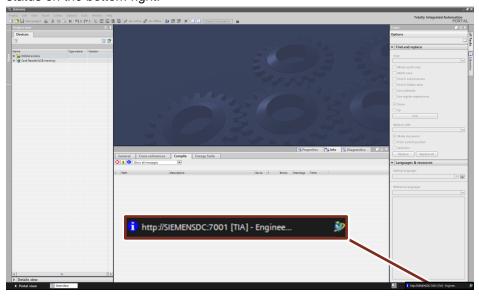To connect to the Teamcenter server, proceed as follows:

1. Start the TIA Portal.

2. In the menu bar, click "Options > Teamcenter > Connect…".

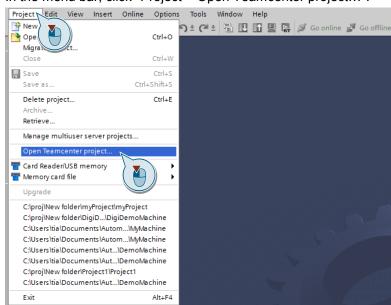3. Enter your user data and click "OK". The user data can be obtained from your Teamcenter administrator.

4. After having established a connection, the TIA Portal shows the corresponding status on the bottom right.

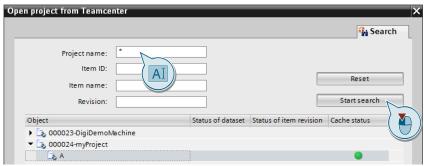## 2.3 Opening a TIA Portal project on the Teamcenter server

To open a TIA Portal project on the Teamcenter server, proceed as follows:

1. Start the TIA Portal.

2. Connect to the Teamcenter server (see chapter 2.2 Establishing a connection to the Teamcenter server).

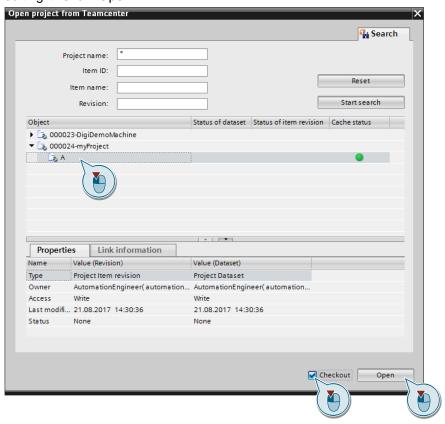3. In the menu bar, click "Project > Open Teamcenter project…".

4. In the dialog, enter the desired project name or "*" for all project names. Click "Start search".
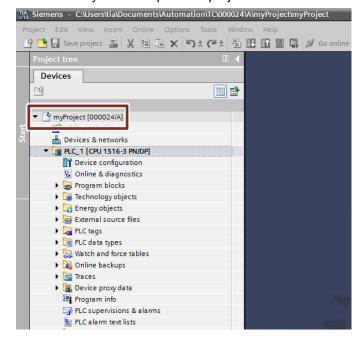   Optionally, you can specify your search more precisely using the fields "Item ID", "Item name" and "Revision".

5. Select your desired project and the corresponding revision from the search results. Enable the "Checkout" option to block the projects for other users while editing it. Click "Open".
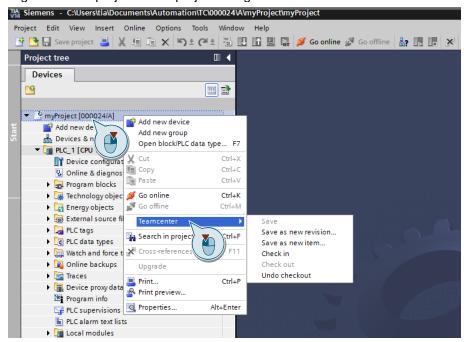

6. In the project navigation, you can recognize from the element ID and the revision that you have opened a project from a Teamcenter server.

2.4 Saving and closing a TIA Portal project on the Teamcenter server

To save or to close a TIA Portal project on the Teamcenter server, proceed as follows:

1. Right-click the project in the project navigation and select "Teamcenter".

2. Here, you have the following options:
   - "Save"
     The project is saved directly in the opened revision.
   - "Save as new revision…"
     The project is saved as a new revision.
   - "Save as new item…"
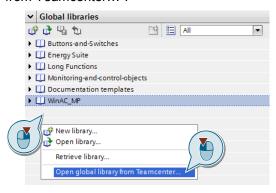   The project is saved as a new item.
   - "Check in"
     The changes are saved. The project is checked in to ensure that other users can access it again.
   - "Undo checkout"
     The changes are discarded. The project is checked in to ensure that other users can access it again.
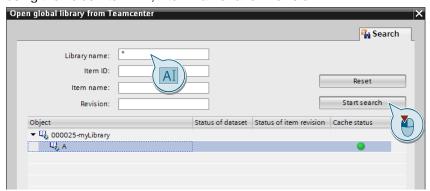
2.5 Opening a global library on the Teamcenter server

To open a global TIA Portal library from the Teamcenter server, proceed as follows:
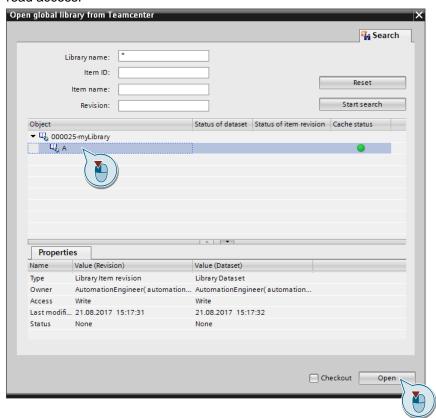
1. Start the TIA Portal.

2. Connect to the Teamcenter server (see chapter 2.2 Establishing a connection to the Teamcenter server).

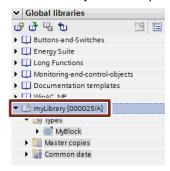3. Right-click the free space in "Global libraries" and select "Open global library from Teamcenter…".

4. In the dialog, enter the desired library name or "*" for all global libraries and click "Start search". Optionally, you can specify your search more precisely using the fields "Item ID", "Item name" and "Revision".

5. Select your desired global library and the corresponding revision from the search results. Click "Open". Do not enable the "Checkout" option, if you are only using the global library without editing it. It will be opened allowing only read access.
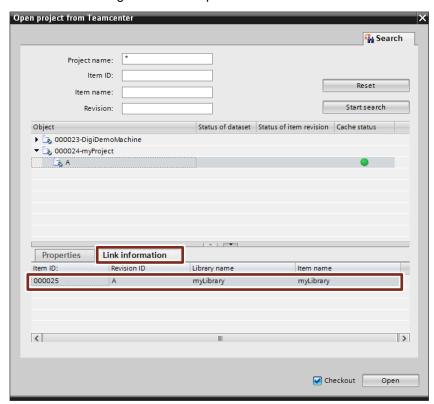

6. In the project navigation, you can recognize from the element ID and the revision that you have opened a global library on a Teamcenter server.

2.6 Dependencies between global libraries and projects

If you use items of a global library in a TIA Portal project, the "Open project from Teamcenter" dialog shows the dependencies.
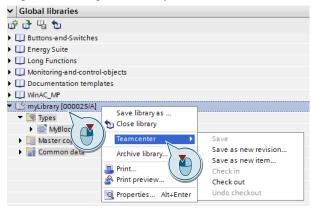

The "Link information" shows from which global libraries the items in the selected project are used.
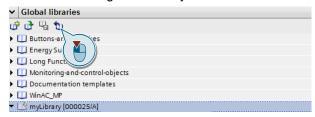
2.7 Saving and closing a global library on the Teamcenter server

To open a global library on the Teamcenter server, proceed as follows:

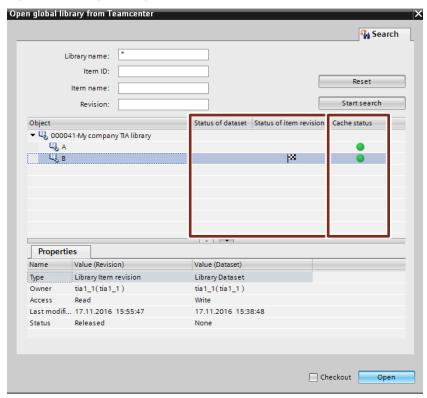1. Right-click the global library in "Global libraries" and select "Teamcenter".

2. Here, you have the following options:

    – "Save"
       The global library is saved directly in the opened revision.

    – "Save as new revision…"
       The global library is saved as a new revision.

    – "Save as new item…"
       The global library is saved as a new item.

    – "Check in"
       The changes are saved. The global library is checked in to ensure that other users can access it again.

    – "Undo checkout"
       The changes are discarded. The global library is checked in to ensure that other users can access it again.

3. Click the "Close global Library" icon.

2.8 Icons in the Teamcenter dialogs

In the "Open project" and "Open library" dialogs, different icons are used to show the current status.

Figure 2-2: Dialog "Open global library from Teamcenter"

"Status of dataset" and "Status of item revision" columns

Table 2-1

Icon	Status	Description
	"Checked out by current user"	Object has been checked out by the current user.
	"Checked out by another user"	Object has been checked out by another user.
	"TCM Released"	Object has the status "RELEASED". It has been released on the Teamcenter server.

"Cache Status" column

Table 2-2

Icon	Status	Description
	"In Sync"	Object has been synchronized with Teamcenter.
	"Locally modified"	Object has been changed by Teamcenter in the local cache.
	"Stale Dataset"	Outdated dataset version is located in the cache.

3 Appendix

3.1 Service & support

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

3.2 Links and literature

Table 3-1

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/109749107
\3\	Link to Siemens PLM software (Teamcenter) https://www.plm.automation.siemens.com/en/products/teamcenter/index.shtml

3.3 Change documentation

Table 3-2

Version	Date	Modifications
V1.0	11/2017	First version