When is an AS Stop necessary when updating PCS 7 libraries?

SIMATIC PCS 7

https://support.industry.siemens.com/cs/ww/en/view/109761162

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1 Introduction

When updating PCS 7 libraries, an AS stop may be necessary. The overviews presented in this entry show for which changed Blocks an AS stop is necessary.

1.1 Description

When PCS 7 is upgraded and the PCS 7 libraries are updated as a result, an AS stop may be necessary.

An AS stop is necessary for the following changes:

- Interface change of a block (FB, FC) in the PCS 7 project
- Structural changes to a global data block
- Compression of the CFC user program

You can find more information in the following FAQ: 19279042

When upgrading a PCS 7 library, it occasionally happens that there is an interface change on the blocks to be updated. Updating the block types in the PCS 7 project, therefore, requires an AS stop in order to be able to replace the affected blocks.

This entry and the accompanying tables will help you determine if an AS stop is necessary.

If a CPU 410-5H is used in the affected project, the function "Type Change in Run" (TCiR) may be used as of PCS 7 version 8.1 to avoid an AS stop. Learn more about this in chapter 4.2 TCiR Type Update in RUN.

Note The following FAQ explains how to update libraries and their blocks in PCS 7 and what you need to keep in mind when doing so: 39980937

Note Interface changes usually only occur with full versions and service packs.

1.2 Delimitation

This FAQ and the accompanying tables are support tools to help users upgrade libraries. Always follow the instructions in the relevant readme.

WARNING

Different versions of the same library are not released in one AS program!

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2 Overview Table for Upgrading PCS 7 Libraries

This overview table provides you with a quick overview of which PCS 7 libraries are compatible with which PCS 7 version. In addition, it is shown at which version jumps there is at least one interface change and, therefore, an AS stop may be necessary for upgrading.

- Quick overview of which PCS 7 libraries are compatible with which PCS 7 version
- Quick overview of whether an AS stop may be necessary in the case of an upgrade

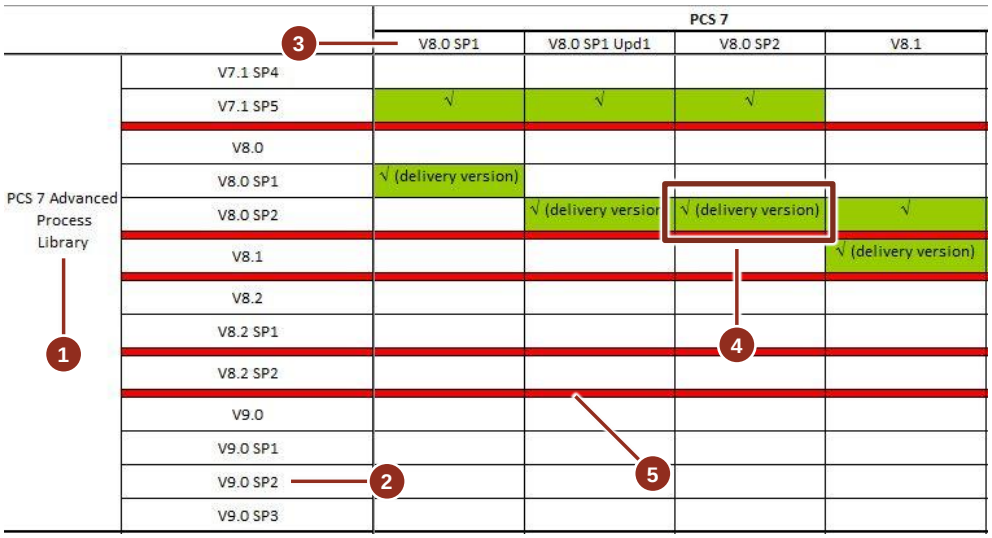
2.1 Application

Procedure

1. Download, unzip, and open the overview table using a suitable program such as Microsoft Excel.
   https://support.industry.siemens.com/cs/en/en/view/109761162
2. Switch to the "Overview table" tab

Description

Figure 2-1



1. In the first column on the left, you will find the various PCS 7 libraries.
2. In the second column on the left, you will find the corresponding versions of the various PCS 7 libraries.
3. In the upper line you will find the PCS 7 versions
4. The green fields indicate the released PCS 7 versions.
5. The red lines indicate the update between the libraries where there is a non-delta loadable change to at least one block and, therefore an AS stop may be necessary.

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3 Evaluation Table for Upgrading PCS 7 Libraries

Refer to the evaluation table for detailed information on updating the individual blocks between the different PCS 7 library versions.

3.1 User scenarios

The evaluation table helps you to determine whether an AS stop is absolutely necessary or whether it can be avoided. In addition, you can use the table to find out from which version a specific block is available or if there has been an update for the block.

- Quick traceability of when the last update for a specific block was made.
- Quick traceability, from which library version a block is available.
- The evaluation table helps to identify whether there is an delta loadable change to a specific block and, therefore, whether an AS stop is necessary.

3.2 Application

Procedure

1. Download, unzip, and open the evaluation table using a suitable program such as Microsoft Excel.
   https://support.industry.siemens.com/cs/en/en/view/109761162
2. In the respective tabs, you will find the various PCS 7 libraries, general notes, and the legend.

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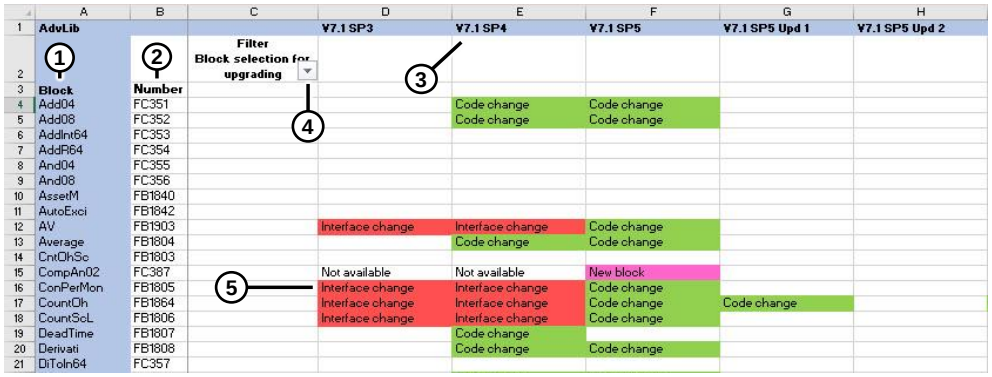
Description

Figure 3-1



	A	B	C	D	E	F	G	H
1	AdvLib			V7.1 SP3	V7.1 SP4	V7.1 SP5	V7.1 SP5 Upd 1	V7.1 SP5 Upd 2
2	①	②	Filter Block selection for upgrading		③			
3	Block	Number						
4	Add04	FC351			Code change	Code change		
5	Add08	FC352			Code change	Code change		
6	AddInt64	FC353						
7	AddR64	FC354						
8	And04	FC355						
9	And08	FC356						
10	AssetM	FB1840						
11	AutoExci	FB1842						
12	AV	FB1903		Interface change	Interface change	Code change		
13	Average	FB1804			Code change	Code change		
14	CntOhSc	FB1803						
15	CompAn02	FC387		Not available	Not available	New block		
16	ConPerMon	FB1805	⑤	Interface change	Interface change	Code change		
17	CountOh	FB1864		Interface change	Interface change	Code change	Code change	
18	CountScL	FB1806		Interface change	Interface change	Code change		
19	DeadTime	FB1807			Code change			
20	Derivati	FB1808			Code change	Code change		
21	DiToIn64	FC357						

④

1. In the left column you will find all blocks of the corresponding library that have been updated. This column is fixed by default.
2. In the second column, you will find the corresponding FC/FB numbers. This column is fixed by default.
3. In the first line, you will find the updates of the respective library versions. The column always refers to the previous version.
4. With these filters, you can display only the required blocks. Further information can be found in chapter 3.3 Reading.
5. The intersection points show you if a change has taken place with the update and which one.

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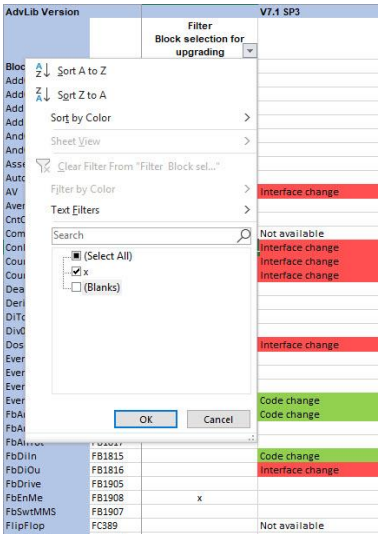
3.3 Reading

1. Determine which blocks of the respective library are used in your PCS 7 project. It is recommended to mark these in the column "Filter block selection for upgrade".

Filter selection

Figure 3-2



- Select the blocks from your project in the "Filter Block selection for upgrading" column in the corresponding rows. Example with "x"
- Click on the arrow in the "Filter Block selection for upgrading" field and tick your selection.
- Make your selection here as to which marked lines are to be displayed and confirm with "Ok".

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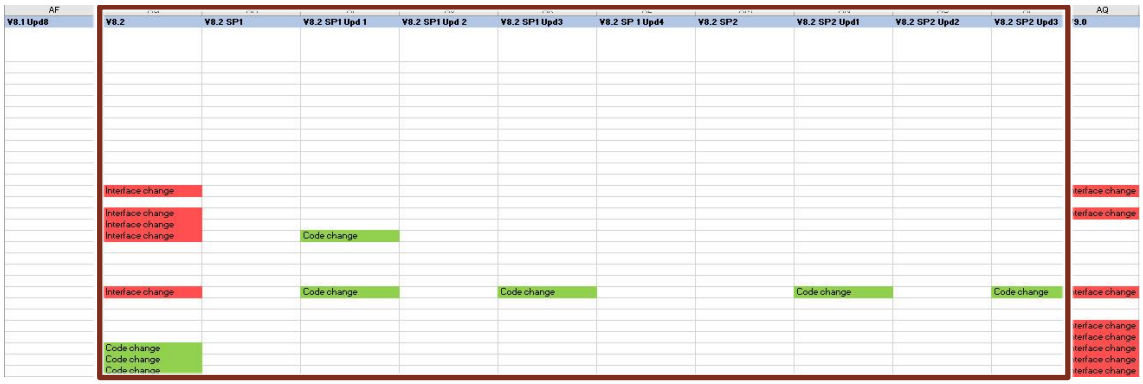
2. Next, find your library version and the version you want to upgrade to. All library versions after your initial version up to and including the version you want to upgrade to are important. Example: Upgrade of the Advanced Library from V8.1 Upd8 to V8.2 SP2 Upd3.

Figure 3-3



Note

You can hide columns that are not required if necessary, this helps with clarity. To do this, select one or more columns, right-click the column header, and select "Hide".

Hidden columns can be displayed again by simply double-clicking the double bar between the adjacent column headers.

3. In the intersections between blocks and the updates, you can now see which changes have been made to the blocks.

Table 3-1

Intersection	Color code	Description
Interface change	Red	Existing interface change AS stop necessary
Code change	Green	Block change, but no interface change
No info	Yellow	No information available in the existing documents
New block	Pink	New block
(empty)	White	No update/no change to the block
Not available	White	Block is only inserted with later version

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3.4 Upgrade with Evaluation Table without AS Stop

An AS stop during the library update is always necessary if there is an interface change to a block (FB, FC) in the AS program.

If in one of the library versions between the source version up to (and including) the target version there is an interface change (red) to a block used in the project, then an AS stop is necessary.

New blocks and code changes do not cause an AS stop.

If there are no interface changes to the blocks in your planned library updates, no AS stop is necessary and the AS project can be updated using change loading.

Blocks that have not yet been used in the project can be used without the need for an AS stop. The system treats these as new blocks.

Please note that a resource check is necessary before upgrading.

CAUTION	Block types that were used in the program but were subsequently deleted from the plans are still stored in the block folder. These blocks can cause an AS stop if there is an interface change with its update. Therefore, it is necessary to clean up the block folder beforehand. Please refer to the manual for more information: SIMATIC Process Control System PCS 7 CFC for SIMATIC S7

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4 Notes on Software Update without AS Stop

4.1 Documentation of the Upgrade with the Evaluation Table without AS Stop

If an upgrade is carried out without an AS stop by means of an evaluation table, it is recommended that appropriate documentation be created for continuous traceability.

This should include the following points:

- Initial version of the library
- Target version of the library
- Intermediate versions
- Which block types the project contains directly before the upgrade.
- Name of the person performing the upgrade and the date of upgrade
- Project and sub-projects concerned

4.2 TCiR Type Update in RUN

Note In general, an upgrade with TCiR should aim at not stopping the AS. However, TCiR does not claim to upgrade the program (the system) in Run mode.

In connection with the CPU 410 (as of firmware V8.1) and PCS 7 (as of V8.1), a type update is supported in RUN mode. As a result, it is possible to update the instances after an interface change for block types and to download the update to the target system in RUN.

- The upgrade via TCiR is only supported for the Advanced Process Library and for the Basic Library from version V8.2.
- Whether the corresponding library update supports TCiR is **not** answered in this FAQ and must be read in the corresponding readme of the library updates. Please also note the corresponding notes on downloading TCiR in the library update readme.
- A Check of POs and a CPU resource check is required before upgrading with TCiR. You can find all information about this in the documentation of the application example:

  Process automation with the SIMATIC PCS 7 CPU 410-5H controller

CAUTION	**If there are not enough PO licenses available during the TCiR download, or if there are not enough resources available, the download will not be completed. It is then only possible to update the user program by overall loading in STOP mode.**

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- Note that you must create new blocks (new number) for the instances of the changed block types that were loaded into the CPU by means of TCiR. The blocks cannot be operated in WinCC until the OS server has been recompiled and downloaded. With a redundant OS server you can compile it before the AS TCiR download and load one of the servers. This means that the plant can be operated before and after AS TCiR loading. Note, however, that when doing this data can be lost in the area of archiving.
- For a detailed description of TCiR and what to look for in general when loading TCiR, please refer to the manual:
  SIMATIC Process Control System PCS 7 CFC for SIMATIC S7

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