

# Advanced Process Functions (APF) Migration Guide from APF V1.4.x to V2.0

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Advanced Process Functions  
(APF)  
Migration Guide  
V1.2.x to V2.0

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## Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a triangular warning symbol; notices referring only to equipment damage have no warning symbol. Warning notices are shown in descending order according to the degree of danger as follows.

 <b>DANGER</b>
Indicates that death or severe personal injury <b>will</b> result if proper precautions are not taken.

 <b>WARNING</b>
Indicates that death or severe personal injury <b>may</b> result if proper precautions are not taken.

 <b>CAUTION</b>
With a triangular warning symbol, indicates that minor personal injury can result if proper precautions are not taken.

<b>NOTICE</b>
Indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A warning notice with a triangular warning symbol indicating possible injury to personnel may also include a warning notice relating to property damage.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. However, since variance cannot be entirely precluded, we cannot guarantee full consistency. The information in this publication is reviewed regularly and necessary corrections are included in subsequent editions.

# Preface

## Purpose of the manual

This documentation will help you to update an existing APF V1.4.x project to APF V2.0.

For information on plant configuration, refer to the "Advanced Process Functions (APF) Engineering Manual".

## Key contents

This document deals with the following key topics:

- What do I need to be aware of when updating?
- What kind of restrictions apply?

## Scope

This manual is valid for the software package APF V2.0.

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# 1 Preparations

## 1.1 Backing up the project

Please back up your multiproject and the OS project of your OS server.

In case you are using Simatic Batch you also need to back up your Simatic Batch project.

## 1.2 Updating PCS 7

Please note that an update from APF V1.4.x to V2.0 requires an update of the PCS 7 system.

Follow the guidelines for the software update from PCS 7 (PCS 7 – Software Update with/without Utilization of the New Functions).

For the update of Simatic Batch follow the relevant chapter in the manual Process Control System PCS 7; SIMATIC BATCH.

## 1.3 Installation

Before installing APF V2.0 you need to remove the previously installed APF version.

Install APF V2.0. Further informations according the installation can be found in the manual "APF\_Installation\_Configuration\_b.doc".

## 1.4 Updating C functions

### Notice

If you are upgrading from APF V1.4 SP2 you can skip step no. 2.

1. Save all functions of the "<OS Server project directory>\library\APF\FB\_UA\_USER\_SPECIFIC" directory.
2. Delete all FB\_\*.fct in the APF folder in the OS project in the directory "<OS Server project directory>\library\APF". (Do not delete any other files, especially no \*.ini files.)
3. Run the Integrator with the "Overwrite user-specific functions" check mark set.
4. If changes have been made to one or more functions in the backup directory from point 2, repeat these changes for the new functions in the directory "<OS Server Project Directory>\library\APF\FB\_UA\_USER\_SPECIFIC".

## 1.5 Updating configuration settings

Running the APF Integrator, as done in chapter 1.4, updates the FB\_Configuration.ini in the "Engineering Tools" directory of the OS server project and the project itself with the advanced features of the new APF version.

## 2 AS

### 2.1 Changing the Function- and Data type numbers

With APF V2.0 the functions of the IEC Library used in APF are replaced with the original functions of the IEC Library. Due to this double entries in the symbol table and conflicts with other PCS 7 libraries, such as the Advanced Process Library (APL) or Industry Library (IL), are avoid.

Because of this the FC numbers must be adjusted once. The FCs with the number to be changed are listed in the table below.

Function name (symbolic name)	Previous number (APF < V2.0)	Actual number (since APF V2.0)
D_TOD_DT	FC103	FC3
DT_DATE	FC106	FC6
DT_DAY	FC107	FC7
DT_TOD	FC108	FC8
EQ_STRNG	FC110	FC10
NE_STRNG	FC111	FC29
FIND	FC112	FC11

#### Notice

In case you are using function blocks, calling the functions listed above, you need to adjust the sources of these blocks and recompile them.

Furthermore a new range of numbers is defined for the UDTs, to keep the reserved range of numbers for the APL available. In the table below you can find the new numbers.

Data type name (symbolic name)	Previous number (APF < V2.0)	Actual number (since APF V2.0)
UDT_SINFO_ST	UDT1	UDT1775
UDT_PA_REQ	UDT2	UDT1776
UDT_PA_CON	UDT3	UDT1777
UDT_UA_R_REQ_ST	UDT4	UDT1778
UDT_UA_R_ST	UDT5	UDT1779
UDT_ANY_ST	UDT6	UDT1780
UDT_UA_W_REQ_ST	UDT7	UDT1781
UDT_UA_W_ST	UDT8	UDT1782
UDT_ALARM_ST	UDT9	UDT1783
UDT_SACT_ST	UDT10	UDT1784

Due to these adjustments you need to adjust the numbers in your project accordingly.

#### Requirement

- SIMATIC Manager is open.

## Procedure

1. The changes must be made in the master data library and in all AS projects containing the affected functions and data types. Therefore, check which AS projects are affected.
2. Select an affected AS project in the component view.
3. Adapt the numbers of all affected functions and data types in "Block Folder Offline"
4. Adapt the block numbers of all affected functions and data types in the corresponding symbol table as well.
5. Check the settings to Compile/Load the PCS 7 program. For this open a CFC chart and select the menu Options > Customize.... Verify that the reserved area for FCs includes all FC numbers used for APF (i.e. at least from 3 to 1775).
6. Now, perform steps 3 to 5 for all AS projects and steps 3 and 4 for the master data library.

## 2.2 Replacing the AS function blocks

Generally all objects of the APF Library (APF Lib) have to be replaced in the master data library. The following table shows all the APF function blocks and their delta download capability in comparison with version 1.4.x.

First, copy all the objects from APF\_Lib into the master data library. This will update the UDTs, SFCs, SFBs and FCs in the master data library, so that a generation under point 2.3 will be performed with the newest blocks. You can find a more detailed description in the APF Engineering Manual.

Block name (head version)	Generated	Block number	Delta download capability
FB_UA_RM		FB 1775	No
FB_UA_WM		FB 1776	No
FB_XXXMA	✓	FB 1777 etc.	No
FB_MLOTD	✓	FB 1778	No
FB_STLOC		FB 1779	No
FB_STMAT		FB 1780	No
FB_STORD	✓	FB_1781 etc.	No
FB_ST_AC		FB 1782	No
FB_SACT		FB 1783	No
FB_XXXPA	✓	FB 1784 etc.	No
FB_JOB		FB 1785	No
FB_XXXAD	✓	FB 1793 etc.	No
FB_BBD		FB 1794	No
FB_PA_ST		FB 1795	No
FB_AL_XX		FB 1796	No

### Notice

A delta download from APF V1.4.x to V2.0 is not possible.

## 2.3 Regenerating blocks

### Requirement

- SIMATIC Manager is open.
- All previous sections in chapter 2 have been considered.
- WinCC Explorer is open.

### Procedure

All blocks that have been or will be generated with the Engineering Tool (marked with ✓ in the "generated" column of the table) must be generated again. To do this, proceed as follows:

1. Open the Engineering Tool.
2. Compare the FB numbers in the master data library with the numbers entered in the Engineering Tool.
3. If these do not match, you may need to adapt the numbers in the Engineering Tool. The numbers are stored from this point on in the Engineering Tool and are retained for future generation processes.
4. Re-generate all existing blocks in the project.

## 2.4 Using an old AS function block

### Notice

You cannot use blocks installed or generated with APF versions prior to 2.0 with the new APF from version 2.0 on!

## 2.5 Compiler settings

All block types created with the Engineering Tool are generated with compiler settings permanently stored in the block code, which means the SCL compiler settings in the project / SIMATIC Manager are not relevant.

## 2.6 Updating AS function blocks in AS projects

### Requirement

- SIMATIC Manager is open.
- All previous sections in chapter 2 have been considered.

### Procedure

All APF blocks (generated and not generated ones) have to be updated in all AS projects of the multi project. For more information please refer to the PCS 7 manual "PCS 7 – Configuration Manual Engineering System" chapter "8.7.5 How to Update Block and SFC Types".

### Result

All APF blocks were updated in all AS projects of the multi project.

## 3 OS server

### 3.1 General

#### Messages

Since new messages were added due to the new functionality, the messages need to be re-imported.

Since APF V2.0 the messages are combined in one import file. The messages will be imported in English and German.

One of the following two procedures should be followed for the import:

#### A) APF message numbers have not been changed

If the APF message numbers have not been adapted in the import files, you simply have to import the file again in the Alarm Logging. The import file is located under "C:\<Program Directory>\Siemens\WinCC\bin\Engineeringtool\Konfig\Messages" and must be imported in the Alarm Logging.

#### B) APF message numbers have been changed

If the APF message numbers have been adapted in the import files, you have to adapt the new import as well. After this you have to import the file again in the Alarm Logging. The import file is located under "C:\<Program Directory>\Siemens\WinCC\bin\Engineeringtool\Konfig\Messages" and must be imported in the Alarm Logging.

#### Note

For more details on importing messages, refer to the documentation "APF\_Installation\_Configuration\_b.pdf"

### 3.2 Global material types

Please consider that, in case your project was already migrated from APF V1.2.x to APF V1.4.x and you have chosen the option "Retaining the material types for each material class", you may not save the material types.

For more information refer to APF Migration Guide V1.2.x-V2.0.

### 3.3 Updating the picture objects

#### @PCS7TypicalsAPF.pdl

Update the block icons for APF as described in the manual "PCS 7 – Configuration Manual Operator Station".

**Notice**

In case you are using objects of the type “@FB\_STMAT/2” or “@FB\_STLOC/2” you need to adjust the tag name for the trigger of the action “OpenFaceplate” manually after the OS compile.

In case the option “Derive the block icons from the plant hierarchy” is enabled for the corresponding picture you need to adjust the trigger after each OS compile.

**@TemplateAPF.pdl**

With help of the function “Update of the picture objects” the picture objects of the previous APF version will be updated with the picture objects of the actual version.

In the previous APF versions picture objects with no function blocks were implemented without a type definition. Due to that it is very likely that those picture objects will be exchanged with a wrong picture object. To avoid this, the property “type” needs to be defined before the function is executed.

**Requirement**

- The OS project is open in the WinCC Explorer on the ES.
- The Graphics Designer is open.

**Procedure**

1. Open the pictures in which you are using APF picture objects, which do not have a “type” definition. The relevant objects are listed in the table below. In case you are not using any of those objects in your project you can proceed with step 3.

**Notice**

If you are not sure in which pictures you are using those objects it is suggested to use the function “Export picture objects” to export all picture objects and search in the created \*.csv file for picture objects with no type definition.

Object name in picture @TemplateAPF.pdl	Description	“type” to assign
FB_ST_SEARCH/1	Opens a faceplate to search for a storage location.	FB_ST_SEARCH/1
FB_MAT_SEARCH/1	Opens a faceplate to search for materials/material lots.	FB_MAT_SEARCH/1
FB_MAT_IN/1	Opens a faceplate for booking in materials/material lots.	FB_MAT_IN/1
FB_MAT_OUT/1	Opens a faceplate for booking out materials/material lots.	FB_MAT_OUT/1
FB_MAT_ADJ/1	Opens a faceplate for adjustment booking of materials/material lots.	FB_MAT_ADJ/1
FB_MAT_CONV/1	Opens a faceplate to convert materials/material lots.	FB_MAT_CONV/1
FB_MAT_IO/1	Opens a faceplate for booking in and out materials/material lots.	FB_MAT_IO/1
FB_DEL_ML/1	Opens a faceplate to delete unused material lots.	FB_DEL_ML/1

2. In the properties of the objects assign the “type” as listed in the table above.

**Notice**

To ensure a later migration it is mandatory to use the type as defined in the table.

3. If all objects in your project have now a type definition, the picture objects can be updated by using the function "Update picture objects". Execute the update with the picture "@TemplateAPF.pdl".

For more information according the update of picture objects please refer to the manual "PCS 7 Configuration Manual - Operator Station".

4. Finally execute the OS Project editor.

## 4 OS client

Follow the instructions below to run the APF integrator on the ES in all OS client projects and update the user-defined APF functions. The clients can then be downloaded again.

### Requirement

- An OS client project is open in WinCC Explorer.
- The user-specific APF functions in the OS server project in the folder "<OS Server Project Directory>\Library\APF\FB\_UA\_USER\_SPECIFIC\" have already been updated there (chapter 1.4).
- The "<OS Server Project Directory>\Library\APF\FB\_UA\_USER\_SPECIFIC\" directory is open in the Windows Explorer.

### Procedure

**Notice** If you are upgrading from APF V1.4 SP2 you can skip step no. 1.

**Notice** Before the APF Integrator is run in OS client projects, the steps described in chapter 1 must be completed.

1. Now delete all FB\_\*.fct in the APF folder in the OS-Client project in the directory "<OS Client project directory>\library\APF". (Do not delete any other files, especially no \*.ini files.)
2. Run the Integrator.
3. Copy all files in the opened directory "<OS Server Project Directory>\Library\APF\FB\_UA\_USER\_SPECIFIC\" to the Windows clipboard.
4. Paste the files from the clipboard into the "<OS Client Project Directory>\Library\APF\FB\_UA\_USER\_SPECIFIC\" directory on the ES.
5. Repeat steps 1 to 4 for each OS client project on the ES.

**Note** You need to open every OS client project one after the other in the WinCC Explorer (not required for referenced OS clients).

## 5 Compiling and loading

Once all changes have been made, you need to compile and download the AS and then the OS, if you have not already done so.

### 5.1 Downloading the OS server

#### Requirement

- The OS project, including the archive data, was updated.
- The instructions from chapters 2.3 have already been carried out.
- SIMATIC Manager is opened.

#### Procedure

Download the OS server or servers using SIMATIC Manager (you can find more information how to download OS servers in the PCS 7 help).