FORCAM™ FORCE

Version 5.9

Adapter for SAP

Product Description

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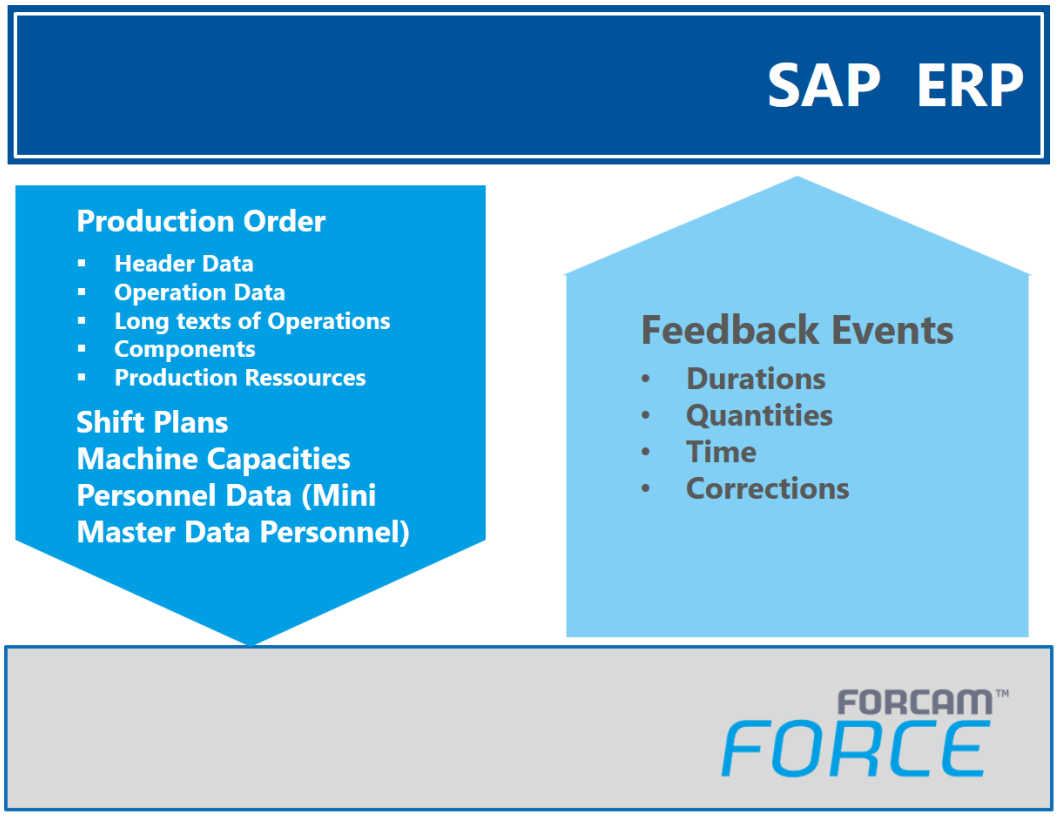
FORCAM FORCE™ Adapter for SAP Overview

The FORCAM FORCE™ Adapter for SAP is an SAP-certified add-on, developed in the ABAP SAP standard development environment to connect SAP ERP with operating data collection in production.

The FORCAM Adapter for SAP supports the provision of production orders created in SAP ERP in production, as well as the integration of the reports created in production into a system environment that runs SAP applications with SAP Net Weaver 7.01. The data exchange between the linked systems is carried out in IDoc format, based on SAP standard XML methods.

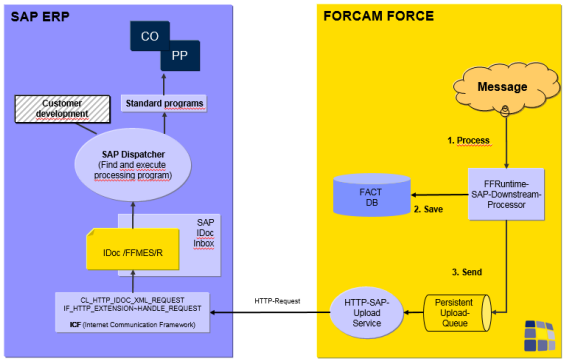


The key function is the exchange of information relating to production orders.

- Production-relevant production order data.
- Shift data / machine performance.
- HR Mini Master
- Confirmations of changes in order status, time lines, and production quantity in SAP.

Core functions

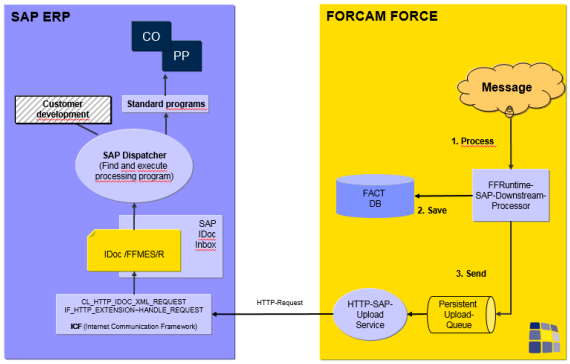
SAP ERP and FORCAM FORCE™ Integration



DOWNLOAD from SAP to FORCAM FORCE™

Downloading data from SAP to FORCAM FORCE™

The display shows that production orders are being created in SAP ERP. Once it has been created with the function module (BADI implementation of the SAP standard WORKORDER_UPDATE), the data is transferred to FORCAM FORCE™ through SAP IDoc outbound in IDoc format. IDocs are sent through the XML port.
The FORCAM Adapter for SAP is a package of ABAP applications that uses RFC (Remote Function Call) and SAP BAPI to exchange data with the SAP system. The data is processed by the adapter and exchanged with FORCAM FORCE™ as IDocs.
The order management (order pool) function of FORCAM FORCE™ gives you a comprehensive overview of all (authorized) orders and the work processes of each workplace. You can also view assignments, the operation status. and production progress.
You can easily and effectively keep track of IDocs in SAP IDoc inbound by using specific reports and graphic representations.



UPLOAD from FORCAM FORCE™ to SAP

Data uploading from FORCAM FORCE™ to SAP

The display shows the order confirmations created in FORCAM FORCE™ which are then transferred to SAP as different messages. The data is transferred to the SAP system as IDocs. The data communication is done through the SAP standard IDoc XML service of the IDoc communication framework.
The inbound function module/FFMES/IDOC_INPUT_MESSAGE processes the incoming IDocs in turn and launches the function module BAPI-/FFMES/BAPI_PROCESS_MESSSAGE.
The times reported by FORCAM FORCE™ are then assigned to the different activities in SAP, making them distinguishable from each other.

Main features

- Easy installation - The installation is easy, it is carried out with SAP standards, and it does not require any further SAP licenses.
- Flexible integration - The FORCAM Adapter for SAP enables easy and logical integration of new functions, programs, and tables in the SAP standard.
- Configurable - The SAP connection is configurable. It transfers data in real-time. This helps avoid unnecessary data streams transfers between SAP and FORCAM FORCE™.
- Communication - The FORCAM Adapter for SAP enables immediate and easy data transfer via RCF (Remote Call Function), HTTP XML communication, and web services (IDoc communication framework).
- Uniform - An integrated revision module ensures that there is no need to handle data twice between the two systems.

Scope of functions

- The order data is transferred in IDoc segments of an IDoc basis type (/FFMES/F) to the subordinate system. This IDoc contains different optional segments.
- The workplace shift data with n breaks are transferred by the /FFMES/TRANSFER_SCHICHT_DATA as IDoc with its own base type (/FFMES/S) to the connected FORCAM FORCE™. You can select the available capacity through this message and then an IDoc is created. You can also transfer shift capacities outside of the plant schedule.
- The selected master data with n plants are transferred by the /FFMES/TRANSFER_HR_DATA program to the connected FORCAM FORCE™. This report is used to select the valid HR per plant and compile the HR in an IDoc with its own base type (/FFMES/H).
- The inbound FORCAM FORCE™ data is then processed as IDocs by the SAP system. The data communication is done through the SAP standard IDoc XML service of the IDoc communication framework. SAP internal standard database tables as well as feedback signals from FORCAM FORCE™ are updated.
- While an order is being fulfilled, different messages can be received from FORCAM FORCE™. Booking messages of the CO11N transaction are recorded in the control table /FFMES/RUECKTAB. There is also a client-specific function that lets you book confirmations. The command for this is CUST_SPEC_CONF.

Report types

- Status reports
- Quantity reports
- Timeline reports

Feedback	Report type	Description
OPSTR	STATUS	FORCAM FORCE™ report when the work process starts
OPINT	STATUS	FORCAM FORCE™ report when the work process is interrupted
OPEND	STATUS	FORCAM FORCE™ report when the work process ends
QTYMG	QUANTITY	Quantity reported by FORCAM FORCE™ to SAP (confirmed quantity)
DURAT	TIME CONFIRMATIONS	The report contains the time base sent from FORCAM FORCE™. SAP uses the duration contained in the report and transforms it and determines the time unit from the order.

Features

- The IDocs are serialized through the business object types /FFMES/MSG, which is a standard feature of the FORCAM Adapter for SAP. The IDoc serialization is only activated while IDocs are incoming. These types guarantee that the report order is always kept with the same object type on the receiver side. All records on the receiver side are processed in the correct order as arranged by the sender side. The function module /FFMES/SERIAL_CHANNEL_USED from the function group /FFMES/REQUEST is used for the synchronization of object channels to carry out serialization with FORCAM FORCE™. This function module is launched by FORCAM FORCE™ through a SOAP request (a request to a function module outside of SAP).
- Two types of serialization are offered. One can be carried out on the workplace level and the other on the work process level.
- The FORCAM Adapter for SAP has an integrated revision module which directly triggers revision entries in FORCAM FORCE™, which are then sent to the SAP system. Revisions are a special type of report sent from FORCAM FORCE™ to the SAP system. You can launch revisions for all reports sent between FORCAM FORCE™ and SAP automatically, using report type REVMG. These reports contain the additional report type (KORSA) and the internal GUID (KORID) of the entry being corrected. Revisions are recorded in the table /FFMES/KORR_CUST. The client-specific processing of the revisions is adapted by the table /FFMES/KORR_CUST. CUST_CONF needs to be ticked in the /FFMES/GLOBAL table. Finally, CUST_SPEC_CANC_CONF must also be executed. The IDocs are received by the SAP standard inbound with the FFMES/R basis type.
- Client-specific adjustments can be introduced if the FORCAM standard scope of functions is inadequate. Different optimization methods can be used to implement client-specific functions. No changes to the SAP standard are required for this.
- You can also carry out the additional transfer of the production orders. The report FFMES/TRANSFER_ORDER_SPEC can be used for the selective or initial transfer of orders.

Order confirmation

Incoming IDocs with the basis type /FFMES/R are processed by the BAPI function module **/FFMES/BAPI_PROCESS_MESSAGE**, where the processing routine is determined through the 'RECORD TYPE' in the IDoc data report.
In most cases an order confirmation is sent, given that most of the reports sent by the connected FORCAM FORCE™ system are order-specific.
This is carried out by requesting the function module **BAPI_PRODORDCONF_CREATE_TT**. The necessary data for the request of the function module is sent from FORCAM FORCE™ through the inbound IDoc. Some data is taken from the SAP tables and added.

While the revision reports are processed, the existing bookings are reversed in their order before a new order confirmation can be created. The reversing of existing confirmations can be prompted by requesting the function module **BAPI_PRODORDCONF_CANCEL**. The necessary data for the request of the function module is sent by FORCAM FORCE™ as IDocs. Some data is taken from the SAP tables and added.
Below is a list of all BAPIs required for different actions.

- BAPI_PRODORDCONF_CANCEL
- BAPI_PRODORDCONF_CREATE_TT
- BAPI_PRODORDCONF_GETDETAIL
- BAPI_PRODORD_GET_DETAIL
- BAPI_ACC_ACTIVITY_ALLOC_POST
- BAPI_ACC_ACT_POSTINGS_REVERSE
- /FFMES/BAPI_PROCESS_MESSAGE

Feature Specification

General

- All developments are available for SAP version 4.6C and higher.
- Data transfers are carried out in IDoc format (inbound and outbound).
- IDoc Monitoring for the FORCAM base types is performed by the FORCAM IDoc Dashboard or can also be executed by individual SAP standard transactions.
- All developments come in a certified package with a customer namespace.
- Client-specific add-ons can be done.
- SAP standard tables are not altered.
- Updated new versions of the FORCAM Adapter for SAP are available.
- The security configuration "SSL" can be used for communication with FROCAM FORCE™ (upload and download communication). The availability of HTTPS including SSL certificate must be provided by the customer in the respective SAP environment and all necessary configurations must be made.

Transfers in case of loss of connectivity

- During connectivity losses no data is transferred.
- The Manufacturing Execution System has a function that queues the IDocs for later dispatch.

Downloading production orders from SAP to FORCAM FORCE™

- Order header data
- Work process data
- Work process - long text
- Production resources
- Order parts

Download shift data

- Shift plans / machine performance.

Download HR mini master

- HR mini master

Uploading from FORCAM FORCE™ to SAP

- Order confirmations: Quantities, real times
- Status changes: System status (e.g. PCNF / CNF) and additional user status

FORCAM IDoc Dashboard

- Central access point for the transparency of IDoc process and data processing of bi-directional FORCAM adapter interface
- Unified interface as bases for optimized navigation
- A tool that is optimally tuned for use with the FORCAM adapter
- IDoc Monitoring for the FORCAM base types is made significantly easier
- The user gets a detailed overview of the current order situation. Malfunctions can be detected and rectified quickly and efficiently.

Customer benefits

Avoidance of handling the same data twice, which also means the client is guaranteed to have no conflicting data. Real time data communication is made possible using IDoc communication. Modern web-based technologies are used to establish communication between systems. Data losses can be prevented, even when one of the connected partners is unreachable for a period of time. The SAP IDoc technology ensures data is reliably processed.
You can easily build on the data communication, adapting to client needs. The product comes as a complete package with a custom namespace and doesn't cause any SAP interruptions or impact on the functionality for client.

- No changes are necessary to integrate client-specific processing into the core functionality of the interface.
- Clients can optimize the interface to match their specific requirements without needing to change or adjust it.

Available optimizations are:

- WORKORDER_UPDATE
- /FFMES/CUST_ENH