

# Function Module to retrieve Forecast Results for SAP F&R

## Objective:

Make modeling and forecast results available to SAP Forecasting and Replenishment (SAP F&R).

Forecast results are the forecast values, forecast (daily error) variances and the DIF\_ACTIVE bit pattern, model results are the error (mean square error) variances and time-series variances.

## Function Module:

Forecast results can be retrieved cross-system by calling the remote enabled function module ("RFC"):

/DMF/UFC\_RETRIEVE\_RESULTS\_FR

For more information, see the ABAP system documentation of the function module (**transaction SE37 -> /DMF/UFC\_RETRIEVE\_RESULTS\_FR -> Function Module Documentation**).

## Interface:

### Input parameters:

Parameter name	Default value	Field Name	Description
IV_DIAG_ID	' '		Diagnostic Identifier: Needed to be able to retrieve model/forecast results of a specific diagnostic run.
IV_SENDER			Logical system: Needed when using external product and location names
IT_PL_FC_HORIZON			Input table to define the set of product locations which should be processed.
		EXT_PROD_ID	External representation of Product Identifier. If the value is numeric (only contains numbers) it has to have leading zeros up to the length of 60 characters.
		EXT_LOC_ID	External representation of Location Identifier
		LOC_TCD	Location Type Code
		HORIZON_START_DATE	Start date of the forecasts
		HORIZON_END_DATE	End date of the forecasts
		CONSIDER_SALES_ORDERS	Set this flag to 'X' to include sales order forecasts into the output.
		CONSIDER_TD_ERROR_VARIANCE	Set this flag to 'X' to include daily error variances into the output. Set it to '-' to explicitly use the constant error variance from the metric 'SYS:MOD:MSE'.

## Notes:

- The time-series source depends on the location type code specified:

LOC_TCD	TS_SOURCE	Description
1040	POS_TS	If the location type-code is set to store, Point-Of-Sales data is returned
1002	CONS_TS	If the location type-code is set to Distribution Center, Consumption sales data is returned

- POS\_VDM is not supported.
- If the flag CONSIDER\_SALES\_ORDERS is set to X for a product-location-type-code, available sales orders forecasts values (TS\_SOURCE = SO\_VDM) are added per day.

### Output parameters:

Parameter name	Field Name	Description
<b>ET_PL_FC_TS</b>		Forecast results per prod-loc
	EXT_PROD_ID	External representation of Product Identifier
	EXT_LOC_ID	External representation of Location Identifier
	LOC_TCD	Location Type Code
	OBS_VAR_ALL	Variance based on all observations (without any exclusion). The values are aggregated on week level. If the value is not available, -1.0 is set.
	OBS_VAR_EXCL_PROD_DIF	Variance based only on observations that are not influenced by a product DIF effect (an offer or a user DIF on product or product-location level is active). The values are aggregated on week level. If the value is not available, -1.0 is set.
	OBS_VAR_EXCL_LOC_DIF	Variance based only on observations that are not influenced by a location DIF effect (a public holiday (ramp up, on and ramp down) or a user DIF on location level is active). The values are aggregated on week level. If the value is not available, -1.0 is set.
	OBS_VAR_EXCL_ALL_DIF	Variance based on observations that are not influenced by any DIF effect. The values are aggregated on week level. If the value is not available, -1.0 is set.
	<b>FC_TS</b>	This sub table contains forecast values per product-location.
	FC_DATE	Date of the forecast value
	FC_VALUE	Aggregated forecast value for this day
	FC_VARIANCE	Daily error variance
	FC_DIF_ACTIVE	Bit pattern to indicate if a forecast value is influenced by a Boolean user DIF (product, location), an offer or a calendar effect. Bit 0: offer Bit 1: calendar effect Bit 2: Boolean user DIF on product / location, product Bit 3: Boolean user DIF on location
<b>ET_MSG</b>		
	TYPE	Message type: E Error, W Warning
	ID	Message Class
	NUMBER	Message Number
	MESSAGE	Message Text
	LOG_NO	Application log: log number
	LOG_MSG_NO	Application log: Internal message serial number
	MESSAGE_V1	Message Variable
	MESSAGE_V2	Message Variable
	MESSAGE_V3	Message Variable
	MESSAGE_V4	Message Variable
	PARAMETER	Parameter Name
	ROW	Line in parameter this error relates to
	FIELD	Field in parameter

	SYSTEM	Logical system from which message originates
--	--------	--

Below is the list and description of the messages that can occur after execution of this function module.

Message class	Msg. no.	Message Short text	Msg. var. 1	Msg. var. 2	Msg. var. 3	Msg. var. 4	Description
/DMF/MSG_HL <i>Type: E</i>	004	RFC authorization failure	-	-	-	-	User is not authorized to call this function module remotely
/DMF/MSG_HL <i>Type: E</i>	904	Function call is not supported	-	-	-	-	UDF is not properly installed on the system (required business functions are not implemented).
/DMF/MSG_HL <i>Type: E</i>	003	Logical system &1: does not exist.	Provided input value	-	-	-	The logical system (IV_SENDER) does not exist.
/DMF/MSG_HL <i>Type: E</i>	006	Diagnostic Id &1 does not exist	Provided input value	-	-	-	Diagnostic identifier (IV_DIAG_ID) does not exist (is not configured in the system).  If the input parameter value is empty (initial), this message is never raised.
/DMF/MSG_HL <i>Type: E</i>	912	Product &1 location &2 location type code &3 does not exist	External Product ID from the input list	External Location ID from the input list	Location type code	-	The product-location does not exist in the system.  Note: This message is not raised if there is no forecast data for existing product-locations. In this case message 025 of class /DMF/UDF_BUSINESS is raised.
/DMF/UDF_BUSINESS <i>Type: E</i>	027	No forecasts available for product &1 location &2 location type code &3	External Product ID from the input list	External Location ID from the input list	Location type code	-	This message is produced per product-location when the product-location does not have time series data in the requested horizon (data from /DMF/UFC_TS).
/DMF/UDF_BUSINESS <i>Type: W</i>	028	Cannot forecast error variances for prod &1 loc &2 loc type code &3	External Product ID from the input list	External Location ID from the input list	Location type code	-	This message is produced per product-location when the error variance is not available.  This can happen when a forecast was triggered for a prod-loc with no modeling parameters available. For this situations, UDF has the hierarchical prior's calculation which calculates prior values out of the neighbor products in the product and location hierarchy. These priors are then used in forecasting as replacement for the missing modeling parameters.

/DMF/UDF_BUSINESS Type: W	024	No time-dp. err. variances prod &1 loc &2 loc type code &3; used fallback	External Product ID from the input list	External Location ID from the input list	Location type code	-	This message is produced per product-location when the switch to consider error variance is on but all the FC_VAR for that product-location are zero. In this case the average error variance of the whole time series for the product-location is returned (SYS:MOD:MSE of table /DMF/UMD_MET).
------------------------------	-----	---	---	--	--------------------	---	--

**Note:**

The key of the output table is product-location-location\_type\_code. However, UDF knows more keys:

- product-location and multi-channel keys
- regular sales and offer sales at one day

If there is more than one record at a day due to regular sales and offer sales or as there are sales for more than one multi-channel, results are aggregated on the product-location-day level.

## Example:

Go to transaction SE37 and test/execute(F8) /DMF/UFC\_RETRIEVE\_RESULTS\_FR. Fill the required information as shown below

**Test Function Module: Initial Screen**

Debugging Test data directory

Test for function group /DMF/FORECAST  
 Function module /DMF/UFC\_RETRIEVE\_RESULTS\_FR  
 Uppercase/Lowercase

RFC target sys:

Import parameters	Value
IV_DIAG_ID	DEMO
IV_SENDER	RTICLNT700
IT_PL_FC_HORIZON	3 Entries

The following screen is displayed when clicked on '3 Entries'. Alternatively fill the input fields as shown below if empty(in case of 0 entries).

Structure Editor: Change IT\_PL\_FC\_HORIZON from Entry 1

3 Entries

EXT_PROD_ID	EXT_LOC_ID	LOC	HORIZON_ST	HORIZON_EN	C	C
UDF_AUNIT_PROD_1	UDF_AUNIT_LOC_1	1040				
UDP_C12	UDL_ZRH	1040				X
UDP_C1	UDL_ZRH	1040				X

After executing(F8) following result is displayed.

Test Function Module: Result Screen

Test for function group /DMF/FORECAST  
 Function module /DMF/UFC\_RETRIEVE\_RESULTS\_FR  
 Uppercase/Lowercase

Runtime: 149.571 Microseconds

RFC target sys:

Import parameters	Value
IV_DIAG_ID	DEMO
IV_SENDER	RTICLNT700
IT_PL_FC_HORIZON	3 Entries

  

Export parameters	Value
ET_PL_FC_TS	2 Entries
ET_MSG	3 Entries

Click on the value field for ET\_PL\_FC\_TS to see forecast results for all product-locations.

Structure Editor: Display ET\_PL\_FC\_TS from Entry 1

2 Entries

EXT_PROD_ID	EXT_LOC_ID	LOC	OBS_VAR_ALL	OBS_VAR_EXCL_PROD_DIF	OBS_VAR_EXCL_LOC_DIF	OBS_VAR_EXCL_ALL_DIF	FC_TS
UDP_C1	UDL_ZRH	1040	2,0361313606065083E+04	1,0048507011421090E+04	1,5683241952290462E+04	1,4593074365745908E+04	146 Entries
UDP_C12	UDL_ZRH	1040	2,2402422327540835E+03	2,2402422327540835E+03	-1,0000000000000000E+00	-1,0000000000000000E+00	146 Entries

Click on FC\_TS entries to see forecast time series result for that product location.

Structure Editor: Display FC\_TS from Entry 1

Column Entry Metadata

FC_DATE	FC_VALUE	FC_VARIANCE	FC_DIF_ACT1
01.10.2015	42,14256	0,0000000000000000E+00	2
02.10.2015	64,56968	0,0000000000000000E+00	2
03.10.2015	0,00000	0,0000000000000000E+00	0
04.10.2015	0,00000	0,0000000000000000E+00	0
05.10.2015	30,49317	0,0000000000000000E+00	2
06.10.2015	41,33787	0,0000000000000000E+00	2
07.10.2015	48,30583	0,0000000000000000E+00	2
08.10.2015	41,66397	0,0000000000000000E+00	2
09.10.2015	63,51626	0,0000000000000000E+00	2
10.10.2015	0,00000	0,0000000000000000E+00	0
11.10.2015	0,00000	0,0000000000000000E+00	0
12.10.2015	0,00000	0,0000000000000000E+00	0
13.10.2015	33,58607	0,0000000000000000E+00	2
14.10.2015	28,62705	0,0000000000000000E+00	2
15.10.2015	29,09173	0,0000000000000000E+00	2
16.10.2015	48,73553	0,0000000000000000E+00	2
17.10.2015	0,00000	0,0000000000000000E+00	0
18.10.2015	0,00000	0,0000000000000000E+00	0
19.10.2015	26,62039	0,0000000000000000E+00	2
20.10.2015	36,84465	0,0000000000000000E+00	2
21.10.2015	43,66653	0,0000000000000000E+00	2
22.10.2015	38,29245	0,0000000000000000E+00	2
23.10.2015	59,14440	0,0000000000000000E+00	2
24.10.2015	0,00000	0,0000000000000000E+00	0
25.10.2015	0,00000	0,0000000000000000E+00	0
26.10.2015	28,70023	0,0000000000000000E+00	2
27.10.2015	40,50905	0,0000000000000000E+00	2
28.10.2015	49,60427	0,0000000000000000E+00	2
29.10.2015	43,42121	0,0000000000000000E+00	2
30.10.2015	67,19948	0,0000000000000000E+00	2
31.10.2015	0,00000	0,0000000000000000E+00	0
01.11.2015	0,00000	0,0000000000000000E+00	0
02.11.2015	33,51302	0,0000000000000000E+00	2
03.11.2015	46,38063	0,0000000000000000E+00	2
04.11.2015	55,49107	0,0000000000000000E+00	2
05.11.2015	49,54387	0,0000000000000000E+00	2
06.11.2015	78,34595	0,0000000000000000E+00	2
07.11.2015	0,00000	0,0000000000000000E+00	0
08.11.2015	0,00000	0,0000000000000000E+00	0
09.11.2015	42,13855	0,0000000000000000E+00	2
10.11.2015	60,01681	0,0000000000000000E+00	2
11.11.2015	38,05795	0,0000000000000000E+00	2
12.11.2015	32,93362	0,0000000000000000E+00	2
13.11.2015	50,31788	0,0000000000000000E+00	2
14.11.2015	0,00000	0,0000000000000000E+00	0
15.11.2015	0,00000	0,0000000000000000E+00	0
16.11.2015	23,89698	0,0000000000000000E+00	2
17.11.2015	32,40078	0,0000000000000000E+00	2
18.11.2015	37,88165	0,0000000000000000E+00	2
19.11.2015	32,85893	0,0000000000000000E+00	2
20.11.2015	50,63442	0,0000000000000000E+00	2
21.11.2015	0,00000	0,0000000000000000E+00	0
22.11.2015	0,00000	0,0000000000000000E+00	0
23.11.2015	24,45486	0,0000000000000000E+00	2

The following message details are displayed when clicked on entries for ET\_MSG parameter.

Structure Editor: Display ET\_MSG from Entry 1

Column Entry Metadata

3 Entries

ID	FROM	MESSAGE	LOG_NO
027	/DMF/UDF_BUSINESS	No forecasts available for product UDF_AUNIT_PROD_1 location UDF_AUNIT_LOC_1 location type code 1040	
028	/DMF/UDF_BUSINESS	No average error variance for prod UDF_AUNIT_PROD_1 loc UDF_AUNIT_LOC_1 loc type code 1040; used zero	
029	/DMF/UDF_BUSINESS	No time-sp. err. variances prod UDF_C12 loc UDF_ERH loc type code 1040; used fallback	

Structure Editor: Display ET\_MSG from Entry 1

Column Entry Metadata

LOG_NO	MESSAGE_V1	MESSAGE_V2	MESSAGE_V3	MESSAGE_V4	PARAMETER	ROW	FIELD
000000	UDF_AUNIT_PROD_1	UDF_AUNIT_LOC_1	1040		IT_PL_FC_HORIZON	1	
000000	UDF_AUNIT_PROD_1	UDF_AUNIT_LOC_1	1040		IT_PL_FC_HORIZON	1	
000000	UDF_C12	UDF_ERH	1040		IT_PL_FC_HORIZON	2	