SAP Connector

Installation and User's Guide

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SAP Connector Installation and User's Guide

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Introduction

The SAP Connector allows you to retrieve data from an SAP system (ECC, R/3, APO, and BW) and transfer it to tables on an Oracle database, and vice versa.

About this guide

The *SAP Connector Installation and User's Guide* describes the configuration settings for the SAP Connector, along with instructions for running the SAP Connector as a stand-alone utility. This guide contains the following chapters:

- Chapter 1: Overview
- Chapter 2: Installing and configuring the SAP Connector
- Chapter 2: Running the SAP Connector
- Chapter 4: SAP Connector BAPI Details

Intended audience

This book is intended for users of EIS or EDS applications, customer Information Technology (IT) staff, and database administrators (DBAs) at customer sites.

The primary audience for this guide is IT personnel and DBAs at customer sites. Their focus is installing, configuring, and maintaining the SAP Connector.

Notation conventions

This section describes notation and formatting conventions used throughout the documentation. These conventions have been defined and are used to provide consistency and clarity as well as to aid visual recall of information.

Convention	Example
Any item that appears literally on the computer screen such as a text field label, a menu name, or a button label is printed in boldface. Information that should be entered exactly as shown is also printed in boldface.	• click **Go** • click **LOGOUT** • Type **2** in the **Factor by** text box.
Keyboard keys are indicated by the text of the key face displayed in upper case and small caps. Key combinations include multiple keys. A plus sign connects names of keys that should be pressed simultaneously.	• ALT • SHIFT • CTRL+ALT+DELETE • SHIFT+S
Information you enter that is specific to your own circumstances, such as your user name or a specific unit cost, is designated by an italic variable name. Italic text is also used to indicate a new term or concept.	• Type *User Name* and press ENTER. • lead time, also called *total lead time*
This symbol indicates information that emphasizes or supplements important points of the main text.	
This symbol indicates a note of caution. Items that warrant a note of caution include warnings that could protect against a loss of data or other undesired behavior.	

Table 1: Notation conventions used in this document

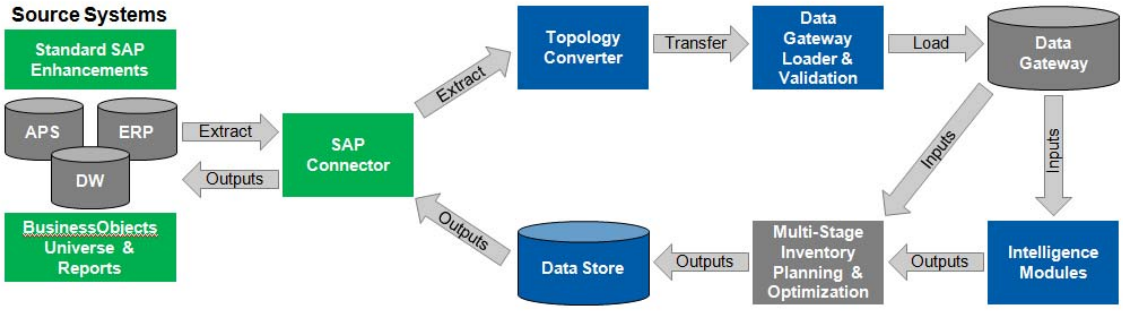
Chapter 1: Overview

The SAP Connector provides a comprehensive data model, flexible integration framework, standard data transformations, and a library of custom BAPIs to make the integration process between SAP and EIS data applications as simple as possible and minimize the amount of custom development required.

The SAP Connector utilizes the standard Java Connector from SAP and provides a framework in which standard or custom BAPIs (Business Application Programming Interfaces) can be called for the exchange of data.

The diagram below depicts the high level data flow between SAP and EIS environments. The data flow is bi-directional, with data from SAP to EIS considered Inbound, while Outbound data originates from EIS and ends up in SAP.

The XML configuration file contains the BAPI settings and defined application tables used by the SAP Connector to exchange data between SAP and EIS applications. This configuration file can be edited by a text editor and is organized by Inbound and Outbound sections.



SAP-EIS Data Flow

For the EIS-SAP bidirectional connectivity to be complete, BAPIs should be available for all relevant data inputs and outputs. While SAP has several standard BAPIs available, a library of EIS-specific BAPIs has been developed on the Inbound side.

The ESI-specific BAPIs provide access to the supply chain data required for the core MIPO application, the Demand Intelligence Module (DIM), the Supply Intelligence Module (SIM), and the Production Intelligence Module (PIM).

Although the ESI-specific BAPIs include the most commonly utilized business logic, these BAPIs are designed to allow for further customization depending any additional business logic or specific SAP configurations.

Customers can choose to use the ESI-specific BAPIs and enhance them utilizing their internal IT resources or the custom development. Certain static data required by EIS is not available within SAP systems. Each customer may determine the desired methodology for maintaining this data.

Chapter 2: Installing the SAP Connector

This chapter describes the installation process related to the SAP Connector. Designed to run as a separate utility module, the SAP Connector installation consists of four steps:

1. Register the EIO namespace on your SAP system
2. Install the SAP Connector on your SAP system using AAK transport (ECC)
3. Configure EIO data view access

Step 1: Registering the EIO namespace

Note: Perform this step only for an initial installation of the SAP Connector.

To register the EIO namespace, you must do the following:

1. Log on to the SAP system.
2. Call the ABAP Dictionary (transaction SE11).
3. On the Initial Screen, select **View** and enter **V_TRNSPACE**.

4. Press **Display** to open the Dictionary: Display View screen.
5. Press **Table View** and the **View Flds** tab to see the table fields for V_TRNSPACE.
6. Press **Display/Change** to switch to the Dictionary: Change View screen.
7. Press **Select (check)** on the Information dialog box to continue.
8. Press **New Entries** to see the New Entries: Details of Added Entries screen (see Figure 2-1).
9. Add the following information:
   a. For **Namespace**, enter `/EIO/`.
   b. For **Namespace role**, enter `C`.
   c. For **Repair License**, enter your SmartOps license number (i.e., 15380837081182917966).
   d. For **Short Text**, enter `SmartOps Enterprise Inventory Optimization ABAP Add-on`.
   e. For **Owner**, enter `SmartOps`.
6. Press **Save** to complete the registration process.

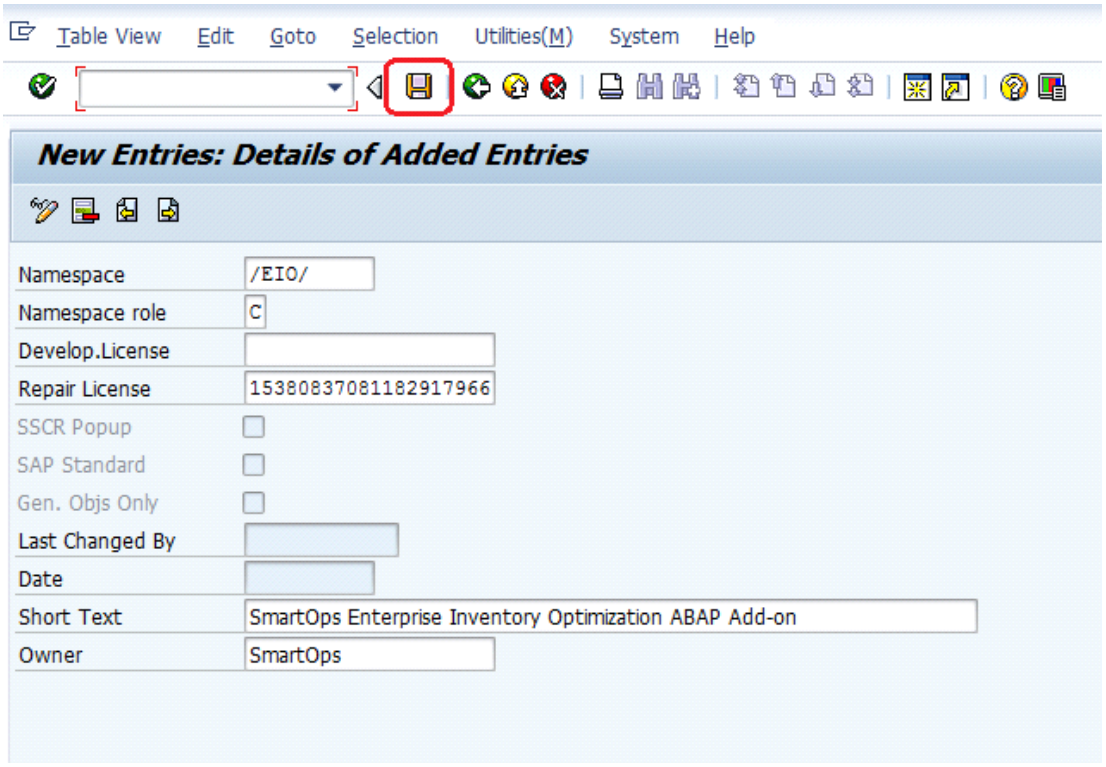


Figure 2-1 SAP Namespace Registration

Step 2: Installing the SAP Connector using AAK transport (ECC 6.0)

Note: You must have administrative rights to the application server where you plan to install the SAP Connector application. If you have any questions about your network access privileges, contact your IT department.

To install the SAP connector application, you must do the following:

1. Copy the SAP Connector application files, including the AAK Transport package, to the application server
2. Install the AAK Transport package to the SAP application server

Copying SAP Connector application files

The SAP Connector application consists of four main components:

- The Java connector
- A library of commonly used and custom BAPIs
- An ABAP add-on provides EIO-specific data management in SAP system
- Two XML configuration template files

Copy all of the files and associated sub-directories from the installation media or directory to an appropriate folder on the application server (e.g., SAP_Connector).

Installing the AAK Transport package

The SAP Connector application includes the Transport package containing customized files to import into the SAP system. To copy the Transport package, do the following:

1. Unzip the AAK Copy the AAK Transport package file (e.g., `EIOxxxxx.pat`) to the respective folder on the SAP application server (e.g., `/sap/trans/EPS/in`).
2. Log on to the ECC system.
3. Call the Add-On Installation Tool (transaction SAINT). The system displays the Add-On Installation Tool screen.
4. Click **Start** to begin the installation process. The subsequent screen shows you the Add-On Packages that can be installed.
5. Click **Load** to search in the EPS directory of the current system for the EIO installation package.
6. When asked if you want to upload a package, click **Yes**. The system displays the Uploaded successfully in SAINT: Uploading Packages from the File System screen.

7. Click **Back** button. The EIO package name now appears in the Installable Add On Packages table.
8. Select the EIO package from table and click **Continue**. Note: You can also select additional support packs if necessary from the table before clicking **Continue**.
9. To add the selected support packages to the installation queue, click **Continue**.
10. To accept default Start Options, click **Continue**.
11. To accept Conventional Import Mode, click **Continue**.
12. To complete the import process, click **Continue**.

For any issues relating to installing the AAK transport package, review the transport log. See the SAP help portal for more information about transport logs.

Note: If you receive an error (such as "The original object was not overwritten" or "A repaired object was not overwritten"), then re-import the transports from the STMS with the following Options checked: Overwrite Originals, Overwrite Objects in Unconfirmed Repairs.

Step 3: Configure EIO data view access through Material Master for all other clients except client '000'

To provide access to EIO data through standard Material Master screens, do the following:

1. Use the Command field to execute transaction **OMT3E**.
   You'll see the **Change View "Screen sequence control" Overview** screen.
2. The first row should have asterisks (*) in the **SRef:user**, **SRef: matl type**, and **SRef: industry** columns. In the **SSq** column, change the default value to "EI".
3. Press **Save** icon.
4. Create a transport request, if necessary.

Note: The EIO view is activated as part of the MRP views. In order for the EIO views to be visible, the Material Type needs to have the MRP views active.

Chapter 3: Configuring the SAP Connector

This chapter describes specific configuration items related to the SAP Connector. Designed to run as a separate utility module, the SAP Connector configuration includes the following:

- Java application settings
- Gateway Connector module settings
- SAP Connector XML configuration settings

Java application settings

runSAPConnector

The **runSAPConnector** executable file contains the configuration settings to point the SAP Connector to the Java home directory on the application server, along with the associated library path.

You will need to verify that the configuration setting for your Java environment is correct in the **runSAPConnector** executable file. Use a text editor to open the **runSAPConnector** executable file, located in the directory where the SAP Connector files were copied on your application server. Verify

that the Java Home parameter matches the directory path where your Java environment resides on your application server. Update this parameter if necessary and save your changes.

SAP Java Connector (SAP JCo)

In order to run properly in your SAP environment, the SAP Connector requires the SAP Java Connector (SAP JCo) drivers.

It is recommended to use the drivers provided with the SAP Connector for your specific environment. You can also download these drivers from the SAP Connectors download area at the SAP Service Marketplace website (http://service.sap.com/connectors). Follow the installation instructions provided inside the compressed file under **docs/jco/installation.html**.

Note: A copy of the 2.1.8 version of SAP JCo drivers can be found in the SAP Connector installation package under **Deploy/sap-jco**.

Copy the librfc32.dll, sapjco.jar, and sapjcorfc.dll from the installation directory to the **Deploy/lib** directory.

Gateway Connector module settings

The Manage Module Settings feature lets you configure the SAP Connector to work with the Data Gateway. You can do this by logging on to the EIS portal and selecting **Module Settings** under the **Settings** menu.

Gateway Connector module

The Gateway Connector module contains the configuration settings used by the SAP Connector utility to transfer data sets between the source database and the Gateway schema. You can access this module by doing the following:

1. Log on to the Data Gateway application.
2. Select **Module Settings** under the **Settings** menu.
3. Select **Gateway Connector** from the dropdown list.
4. Scroll through the configuration list and fill out the appropriate Gateway Connector parameters. A list of the parameters and their functions is provided below.

   Auto Default Configuration File
   Parameter: Auto Default Configuration File
   Required: Yes
   Behavior: Configuration file to be used in case of automatic transfers when the data set does not have an associated configuration file.
   Default: SampleConfiguration.xml

Auto Export of Scenario to Connector
Parameter: Auto Export of Scenario to Connector
Required: Yes
Behavior: Tells the Data Gateway whether to automatically export a scenario to the external system.
Default: Disabled

Connector Application JVM Initial Heap Size
Parameter: Connector Application JVM Initial Heap Size
Required: Yes
Behavior: Defines the initial heap size for the JVM that starts the connector application.
Default: 200m

Connector Application JVM Maximum Heap Size
Parameter: Connector Application JVM Maximum Heap Size
Required: Yes
Behavior: The maximum heap size for the JVM that starts the connector application.
Default: 800m

Connector Application Library Path
Parameter: Connector Application Library Path
Required: No
Behavior: Defines the library path when the external Java process is invoked through the EIS portal, via the Manage Data Gateway screen.
Default: None

Connector Application Name
Parameter: Connector Application Name
Required: Yes
Behavior: Name of the connector java application. When providing the Connector, use EIO-Connector.jar as the value.
Default: None

Connector Starting Application Name
Parameter: Connector Starting Application Name
Required: Yes
Behavior: Name of the application that starts the connector.
Default: java

Data Augmentation Type
Parameter: Data Augmentation Type
Required: Yes
Behavior: The type of process used by the Data Gateway to perform data augmentation.
Default: Stored Procedure

Data Set Check Interval
Parameter: Data Set Check Interval
Required: Yes

Behavior: Sets the check interval in minutes before the Gateway Connector utility checks to see if there is a loadset.
Default: 10

Export Process Schema
Parameter: Export Process Schema
Required: Yes
Behavior: Defines whether the export process is based off of the MIPO or Data Store database schema. The property ensures that if the export is based off the MIPO schema, then the scenario is locked for the duration of the export.
Default: DATASTORE

When you are finished with your configuration, click **OK**.

If you decide not to implement the changes you made, click **Cancel**.

Disabling the Truncation of Staging Tables

Data Gateway staging tables are truncated during data set loading outdated data. In most cases, we recommend not modifying the truncation of the staging tables.

To disable the truncation of the staging tables, you must manually modify the GATEWAY_CUSTOM_SETTING table to include the following row:

DISABLE_TRUNCATE_STG_TABLES and set the value to YES.

If the row is not present or the value is set to NO, the staging tables will be truncated as normal.

If truncation is skipped, a warning message is recorded in the ERROR_LOG table in the Data Gateway.

SAP Connector XML configuration settings

The SAP Connector uses an XML file to determine the configuration settings for transferring data between SAP and the local Oracle system. In the SAP Connector directory on your application server, you will find two files: **SampleConfiguration.xml** and **SampleConfiguration_1-to-1.xml**. Both of these files perform the same function, but the 1-to1 file limits each BAPI call to a single source and target table mapping. Either file can be used as a template to create a custom XML file with configuration settings for the SAP Connector. The SML file is designed to contain the configuration settings to point the SAP Connector to the SAP BAPIs on the SAP system server, along with the specific data table information on the Oracle database server.

Use a text editor to modify the selected template XML file to set up the configuration parameters for the following:

- SAP connection settings
- Load balancing settings (optional)

- Local system connection settings
- Logging settings
- Batch size setting
- Inbound settings
- Outbound settings

Note: After you configure the XML file, use **Save As** to give the configuration file its own name in order to keep the template file from being overwritten.

Configuring SAP connection settings

You must identify specific server/account information for each SAP system involved in the data transfer process by the configuration parameters listed in the table below:

Property	Description	Value (example)
SAPSYSTEM ID	Unique 2 digit identifier used throughout XML file	01
CLIENT	SAP sytem client setting	300
USERID	SAP system username	user1
PASSWORD	SAP system password **Note:** This parameter supports password encryption. See the section entitled "Encrypting account passwords" for more information.	pass1
LANGUAGE	SAP system language code	EN
HOSTNAME	Hostname or IP address of server where SAP system is installed	system01 192.13.1.41
SYSTEMNUMBER	SAP system number	00
DATE_FORMAT	Date format for this SAP system	dd/MM/yyyy MM/dd/yyyy

Table 2-1 SAP connection settings

Configuring load balancing settings (optional)

Note: The SAP Connector design includes the load balancing option to allow distributed processing for transferring data. To use the load balancing option, the LOADBALANCED_SAPSYSTEM tag and associated code must be uncommented in the SAP Connector XML file.

You must identify specific server/account information for each SAP system involved by the configuration parameters listed in the table below:

Property	Description	Value (example)
SAPSYSTEM ID	Unique 2 digit identifier used throughout XML file	04
CLIENT	SAP sytem client setting	300
USERID	SAP system username	user1
PASSWORD	SAP system password **Note:** This parameter supports password encryption. See the section entitled "Encrypting account passwords" for more information.	pass1
LANGUAGE	SAP system language code	EN
MSHOST	Host name of the message server	YourMsHost
R3NAME	Name of the SAP system	YourR3Name
GROUP	Name of the group of application servers	YourGroup
DATE_FORMAT	Date format for this SAP system	dd/MM/yyyy MM/dd/yyyy

Table 2-2 Load balancing settings

Local system Inbound connection settings

You must identify specific server/account information for the local Oracle database system involved in the data transfer process by the configuration parameters listed in the table below:

Property	Description	Value (example)
URL	Network address of Oracle server	jdbc:oracle:thin:@localhost:1521:SMOPS1

Table 2-3 Local system Inbound connection settings

Property	Description	Value (example)
DRIVER	Local database driver	oracle.jdbc.driver.OracleDriver
USER ID	Local Oracle username	smartops
PASSWORD	Local Oracle password **Note:** This parameter supports password encryption. See the section entitled "Encrypting account passwords" for more information.	smartops

Table 2-3 Local system Inbound connection settings

Local system Outbound connection settings

You must identify specific server/account information for the local Oracle database system involved in the data transfer process by the configuration parameters listed in the table below:

Property	Description	Value (example)
URL	Network address of Oracle server	jdbc:oracle:thin:@localhost:1521:SMOPS1
DRIVER	Local database driver	oracle.jdbc.driver.OracleDriver
USER ID	Local Oracle username	smartops
PASSWORD	Local Oracle password **Note:** This parameter supports password encryption. See the section entitled "Encrypting account passwords" for more information.	smartops

Table 2-4 Local system Outbound connection settings

Configuring logging settings

You must set the log file configuration properties using the parameters listed in the table below:

Property	Description	Value (example)
DEBUG_LOG_FILE	Path and filename of the debug log	D:\\logs\\SmartOps Debug.log

Table 2-5 Logging settings

Property	Description	Value (example)
ERROR_LOG_FILE	Path and filename of the error log	D:\\Smartops\\logs\\ SmartOpsError.log
APPEND	Whether to append or truncate the previous log file	NO YES

Table 2-5 Logging settings

Configuring batch size settings

You must set the batch size used by the SAP Connector to transfer data by the configuration parameters listed in the table below:

Property	Description	Value (example)
BATCH_SIZE	Transaction size in rows inbound to EIS	1000
SAP_BATCH_SIZE	Transaction size in rows outbound to SAP	500

Table 2-6 Batch Size settings

Configuring Inbound settings

Note: The SAP Connector interacts with the Business Application Programming Interface (BAPI) methodology provided by SAP to communicate with the SAP database system. You must know the BAPI names used to access specific data on the SAP system in order to run the SAP Connector correctly. For more information on BAPIs, contact your SAP administrator.

The Inbound process transfers data from SAP to a local Oracle database. You must provide the following information:

- Identify each Inbound BAPI by name and system ID
- For each BAPI, configure the Inbound Mapping parameters
- For the local table, define the cross references, by data field, between BAPI and the local system table
- Specify filtering options on inbound SAP data

Note: The SAP Connector allows the same BAPI to be invoked multiple times.

Inbound BAPI configuration

You must identify each Inbound BAPI used to access SAP data by the configuration parameters listed in the table below:

Property	Description	Value (example)
INBOUND_BAPI NAME	Name of SAP BAPI	BAPI_ PRDSRVAPS_ GETLIST2
SYSTEMID	Must match unique identifier given to SAP system in the SAP connection settings	02

Table 2-7 Inbound BAPI settings

Inbound mapping parameters

For each BAPI, configure the Inbound mapping parameters and define the cross references, by data field, between the BAPI and the local table.

The SAP Connector Inbound will insert records into existing Oracle tables, provided the table definitions match the structure and format of the data being inserted. Specifically, table names, field names, and data types of the existing table must match that of the incoming data. Note that a configuration setting exists to specify whether the existing table should have any existing data removed (truncated) prior to inserting the new data. The SAP Connector will also create Oracle tables during runtime, based on the table names, field names, and data types defined in the XML configuration file, if named tables do not exist.

Identify default values using the configuration parameters listed in the table below:

Property	Description	Value (example)
SAPTABLE TYPE	Type of SAP data structure used	TABLE STRUCTURE
NAME	Name of SAP source data structure	PRODUCT_HEAD
LOCALTABLE TRUNCATE	Whether to truncate or append local table; ability to append dependant on constraints	TRUE FALSE
NAME	Name of target local table	LOCAL_TABLE_ECC
SOURCEFIELD	Name of SAP source data field	PRODUCTID
TARGETFIELD	Name of target local field	PRODUCT_ID
PK	Whether to include field in local table primary key constraint definition; multiple PK fields will create a composite key	YES NO

Table 2-8 Inbound mapping parameters

Property	Description	Value (example)
DATA_TYPE	Data type used for creation of local table and verification of incoming data	char_10 quan_13_3 date
DEFAULT	Value to be inserted if incoming value is null or blank	NONE

Table 2-8 Inbound mapping parameters

Note: For the specific field names used by the EIS-specific BAPIs that interact with ECC, refer to *Chapter 5: SAP Connector BAPI Details*.

Note: When trying to insert a value into a TARGET_FIELD (because the data isn't stored on the SOURCE side), the value of SOURCE_FIELD must still be a valid field name in the BAPI (e.g., STRING).

For example, to insert a default value for Holding Cost Percentage, the definition in the XML file would be (set the value of DEFAULT accordingly):

```
<SOURCEFIELD>STRING
</SOURCEFIELD>
<TARGETFIELD PK="NO" DEFAULT = "0.20"
   DATATYPE="FLTP">HOLDING_COST_PCT
</TARGETFIELD>
```

Inbound filters

For each BAPI, configure the Inbound filter parameters and values using standard SAP filtering methods. All filter criteria defined for a BAPI are considered together to yield the data that intersects (meets all filtering criteria) the entire filter definition.

Property	Description	Value (example)
SAP_FILTER TYPE	Type of SAP filter used	SINGLE TABLE STRUCTURE
TYPE_NAME	Name of SAP filter used	PRODUCT SELECTION

Table 2-9 Inbound filter parameters

Property	Description	Value (example)
FIELD	The specific piece of SAP system data being evaluated	SIGN
FIELD DATATYPE	The expected data type for the values being assessed	char_10
VALUE	The desired filter value	I

Table 2-9 Inbound filter parameters

Note: The FIELD DATATYPE property includes one of four components: SIGN, OPTION, LOW and HIGH. These components allow you to assign a sub-condition for the specified value. The SAP online help system provides detailed information on how to use these components. You can find the information here.

Configuring Outbound settings

The Outbound process transfers data from a local Oracle database to an SAP system. You must provide the following information:

- Identify each Outbound BAPI by name and system ID
- For each BAPI, configure the Outbound Mapping parameters
- For the local table, define the cross references, by data field, between BAPI and the local system table
- Specify filtering options on Outbound data

Outbound BAPI configuration

You must identify each Outbound BAPI used to access SAP data by the configuration parameters listed in the table below:

Property	Description	Value (example)
OUTBOUND_BAPI NAME	Name of SAP BAPI	BAPI_MATERIAL_ SAVEDATA
SYSTEMID	Must match unique identifier given to SAP system in the SAP Connector settings	01

Table 2-10 Outbound BAPI settings

Outbound mapping parameters

For each BAPI, configure the Outbound mapping parameters and define the cross references, by data field, between the BAPI and the local table. Identify default values using the configuration parameters listed in the table below:

Property	Description	Value (example)
LOCALTABLE	Name of the Oracle table	LOCAL_ECC
SAPTABLE TYPE	Type of SAP data structure used	TABLE STRUCTURE
NAME	Name of SAP target data structure	HEADDATA
SOURCEFIELD	Name of source data field	CONTAINER
TARGETFIELD	Name of SAP target field	IND_SECTOR
DATA_TYPE	Data type of Outbound data	char_10 quan_13_3 date
DEFAULT	Value to be inserted if outgoing data is null or blank	NONE

Table 2-11 Outbound mapping parameters

Note: For the specific field names used by the EIS-specific BAPIs that interact with ECC, refer to *Chapter 4: SAP Connector BAPI Details*.

Outbound filters

For each BAPI, configure the Outbound Filter parameters and values using standard filtering logic. Filter criteria can be grouped together using an "OR" connector to yield a union of matching values or an "AND" connector to yield an intersection of matching values or a combination of both.

Property	Description	Value (example)
FILTER TYPE	Name of local table being filtered	LOCAL_BW_TD
FIELD_NAME	Local field name being filtered	INFOSOURCE
CONDITION	Keyword to indicate type of filter	EQUALTO LESSTHAN GREATERTHAN

Table 2-12 Outbound filter parameters

Property	Description	Value (example)
VALUE	The desired filter value	IS_BILL04

Table 2-12 Outbound filter parameters

Note: The FIELD DATATYPE property includes one of four components: SIGN, OPTION, LOW and HIGH. These components allow you to assign a sub-condition for the specified value. The SAP online help system provides detailed information on how to use these components. You can find the information here.

Encrypting account passwords

The SAP Connector supports encrypted passwords for the system accounts used to access the SAP and database servers. You must encrypt every password used by the SAP Connector, then place the encrypted text string in the associated configuration parameter in the SAP Connector XML file.

The **runSAPConnector** executable file includes the password encryption tool.

To encrypt a password, use a Command window to launch the **runSAPConnector** batch file. You will be prompted with "Enter your password." Just type a password and press the Enter key, ensuring that the correct syntax is used for case sensitivity.

You will see the encrypted version of the password. Copy and paste the password from the Command window to the corresponding password parameter in the SAP Connector XML file.

You will also be prompted again to "Enter your password" to allow you to encrypt multiple passwords at the same time. When you are finished encrypting passwords, you can close the Command window.

Chapter 4: Running the SAP Connector

You run SAP Connector Inbound to extract data from SAP and transfer it to an Oracle database. With SAP Connector Outbound, you can extract data from an Oracle database and transfer it to an SAP system. This section provides instructions on how to perform both procedures.

Running the Inbound Connector

Perform the following steps to run the Inbound procedure for the SAP Connector:

1. From the command prompt, navigate to the location of the SAP Connector.
2. Run the SAP Connector Inbound application by typing the following at the command prompt:
   `>runSAPConnector inbound <XML configuration file name>`

The application will display a message in the command window when the process is complete. Always review the error and debug logs for detailed information about the data transfers.

Running the Outbound Connector

Perform the following steps to run the Outbound procedure for the SAP Connector:

1. From the command prompt, navigate to the location of the SAP Connector.
2. Run the SAP Connector Outbound application by typing the following at the command prompt:
   `>runSAPConnector outbound <XML configuration file name>`

The application will display a message in the command window when the process is complete. Always review the error and debug logs for detailed information about the data transfers.

Adding data through Mass Upload

The SAP Connector application allows users to mass upload Item-Location (IL), Item-Location-Customer (ILC), and Vendor data into custom EIO tables in SAP. You can use this feature to initially load data into your SAP system.

You can also use this feature to update IL, ILC, and Vendor data records as an alternative to using the **/EIO/MM02** transaction.

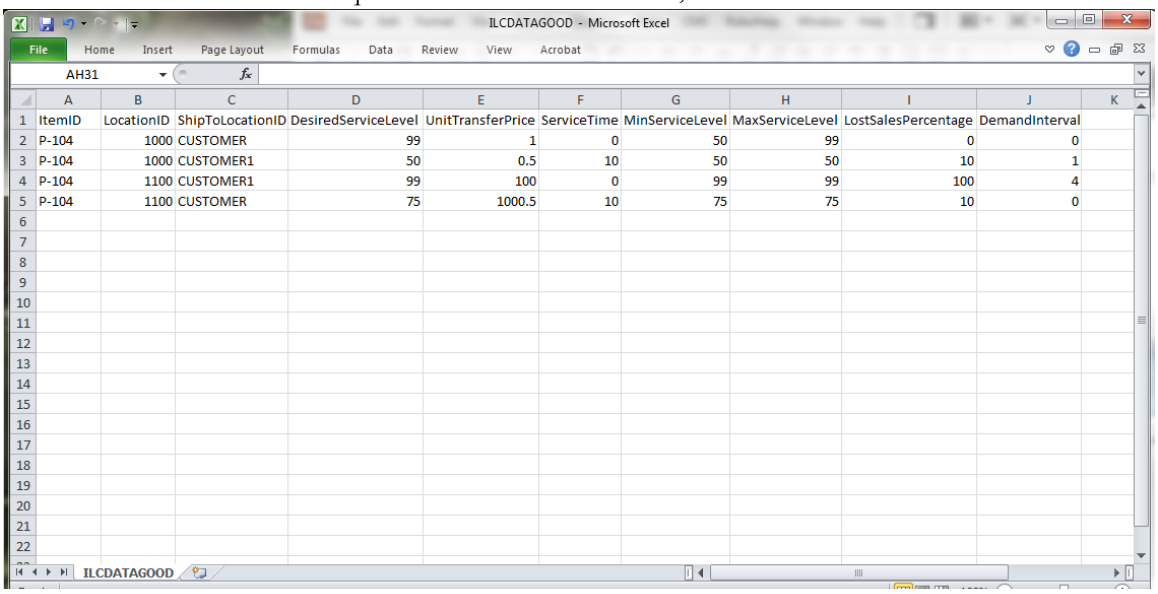
Note: Please note that for each row entered in the Excel template, the Mass Upload process will replace the entire row in your SAP system's associated table. To update one or more specific data fields for a record, it recommended to use the **/EIO/MM02** transaction

Perform the following steps to bulk upload EIS-specific data:

Step 1: Enter data into the text template

1. Enter all bulk data into the Mass Upload text template.

2. Once all of the required information is entered, save as a tab-delimited **.txt** file.



	A	B	C	D	E	F	G	H	I	J	K
1	ItemID	LocationID	ShipToLocationID	DesiredServiceLevel	UnitTransferPrice	ServiceTime	MinServiceLevel	MaxServiceLevel	LostSalesPercentage	DemandInterval	
2	P-104	1000	CUSTOMER	99	1	0	50	99	0	0	
3	P-104	1000	CUSTOMER1	50	0.5	10	50	50	10	1	
4	P-104	1100	CUSTOMER1	99	100	0	99	99	100	4	
5	P-104	1100	CUSTOMER	75	1000.5	10	75	75	10	0	

Figure 3-1 Mass Upload ILC spreadsheet template

Step 2: Use transaction /EIO/MMUPL

1. Use the Command field to execute transaction **/EIO/MMUPL**.
2. Select the appropriate name for the data you are uploading:
   - IL data
   - ILC data
   - Vendor data

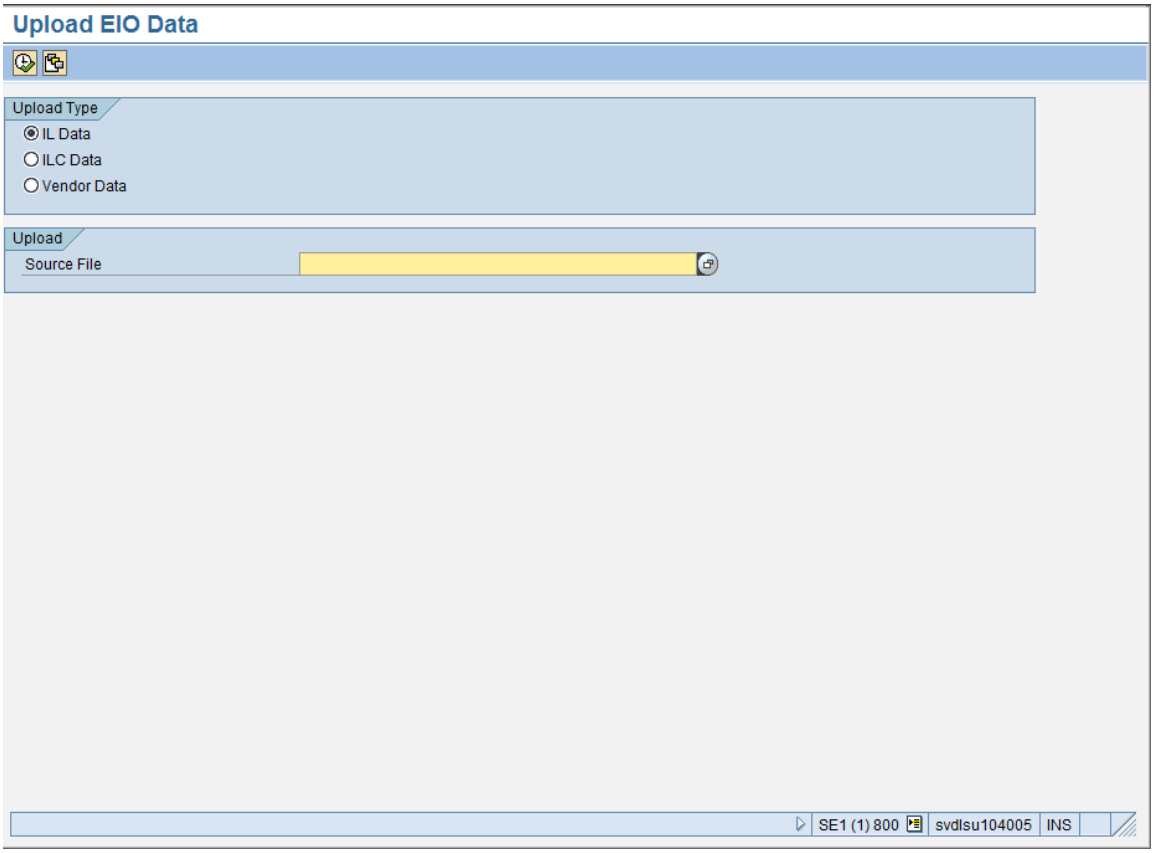


Figure 3-2 Upload EIO Data screen

3. Enter the Source file path for the **.txt** file that you've just created.
   Note: You can also search for the file by clicking the button to the right of the entry field.
4. Click the **Execute** button to upload your data file directly to its associated SAP table.
5. Review the error log information associated with the Mass Upload transaction on the results screen.

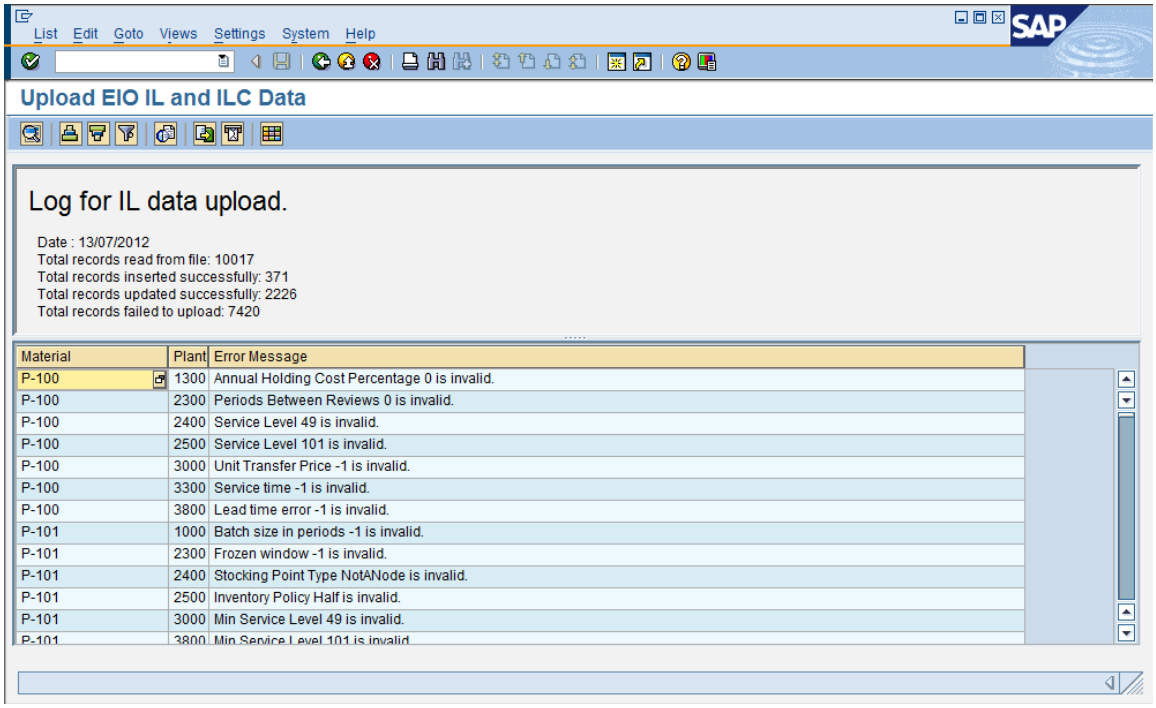


Figure 3-3 Upload IL and ILC Data results screen

Working with data in SAP system

The SAP Connector application design includes customization of ECC files to support EIS-specific data through an ABAP add-on. The ABAP provides custom transactions to create, change and display EIO data.

The following screens are available through the ECC Material Master (MM02, MM03):

- Item-Location (EIO 1)
- Item-Location-Customer (EIO 2)

With these SAP Connector application screens, you can create new data records, change existing records, or display current records in the SAP system.

Adding data in SAP

To add new data to the Material Master in SAP, do the following:

1. Use the **/EIO/MM01** transaction. You should see the **Create IL and ILC Data** screen.

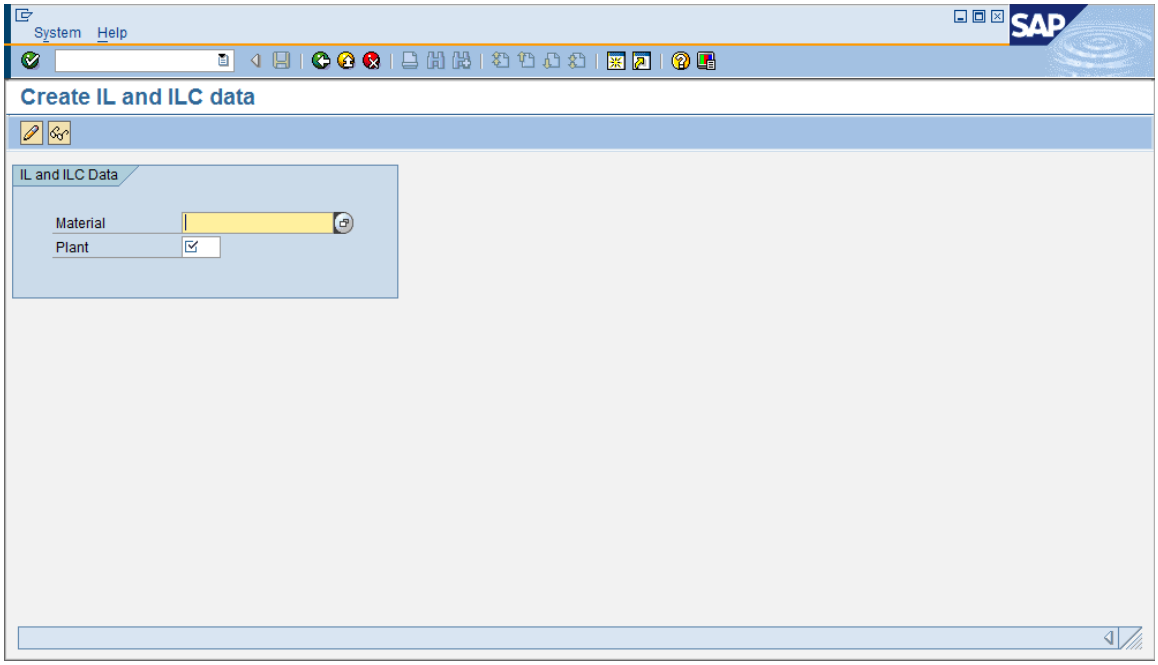


Figure 3-4 Create IL and ILC Data screen

2. Enter the Material and Plant information associated with the new data.
   Notes: You can search for material and plant information by clicking the button to the right of the associated entry field.
   The material/plant combination must already exist in the standard SAP tables, so if the material has not been extended to the general plant view in the Material Master users will not be allowed to create an IL or ILC view for that Material/Plant combination.
3. Click **Enter** button.
4. For Item Location Data (EIO1 tab), enter the following mandatory fields:
   - Stocking Point Type
   - Inventory Allocation Policy
   - Annual Inventory Holding Cost (%)
   - Periods Between Reviews
   - Service Level (%)

Note: The **Inactive** field's check box defaults to unchecked. Use this field to mark inactive Item-Location pairs without losing any original data.

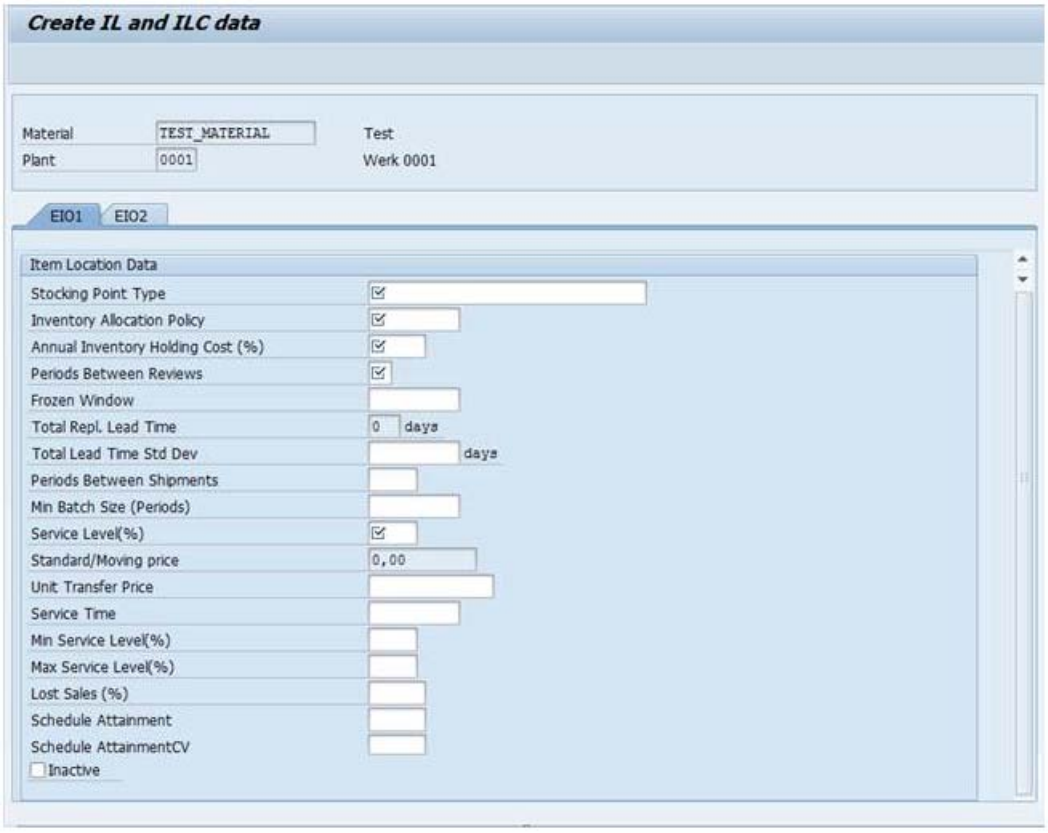


Figure 3-5 Create IL and ILC Data screen, EIO1 tab

5. For Item Location Data (EIO1 tab), you may also enter the following optional fields:
   - Frozen Window
   - Total Replenishment Lead Time
   - Total Lead Time Standard Deviation
   - Periods Between Shipments
   - Minimum Batch Size (Periods)
   - Service Level (%)
   - Standard/Moving Price (read-only)

- Unit Transfer Price

Note: The **Standard/Moving Price** read-only field provides validation for the Unit Transfer Price value. This field will be populated with standard price or moving price based on the price control value.

If the price control is 'S' the standard price will be populated, if the price control is 'V' the moving price will be populated.

When entering a Unit Transfer Price value, only values greater than or equal to the Standard Price will be accepted.

- Service Time
- Minimum Service Level (%)
- Maximum Service Level (%)
- Lost Sales Percentage (%)
- Schedule Attainment
- Schedule Attainment CV
- Inactive

6. For Item Location Customer Data (EIO2 tab), enter the following mandatory fields:
   - Customer
7. If you selected ILC Data, you may also enter the following optional fields:
   - Service Level
   - Unit Transfer Price
   - Service Time
   - Minimum Service Level
   - Maximum Service Level
   - Lost Sales Percentage
   - Demand Interval
   - Leadtime Error
   - Mode

8. Click **Save** when you are finished adding data.

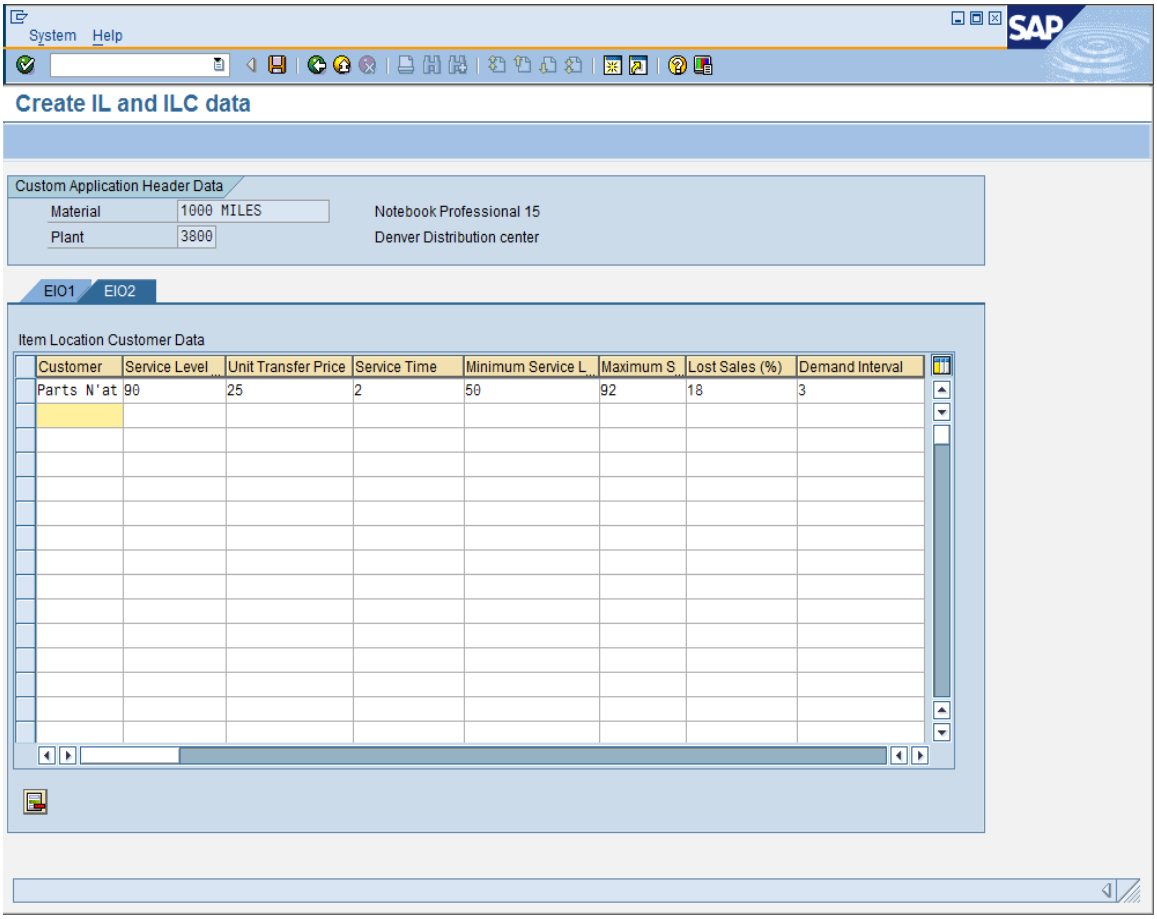


Figure 3-6 Create IL and ILC Data screen, EIO2 tab

Updating data in SAP

To update existing data to the Material Master in SAP, do the following:

1. Use the /**EIO/MM02** transaction. You should see the **Change IL and ILC Data** screen.

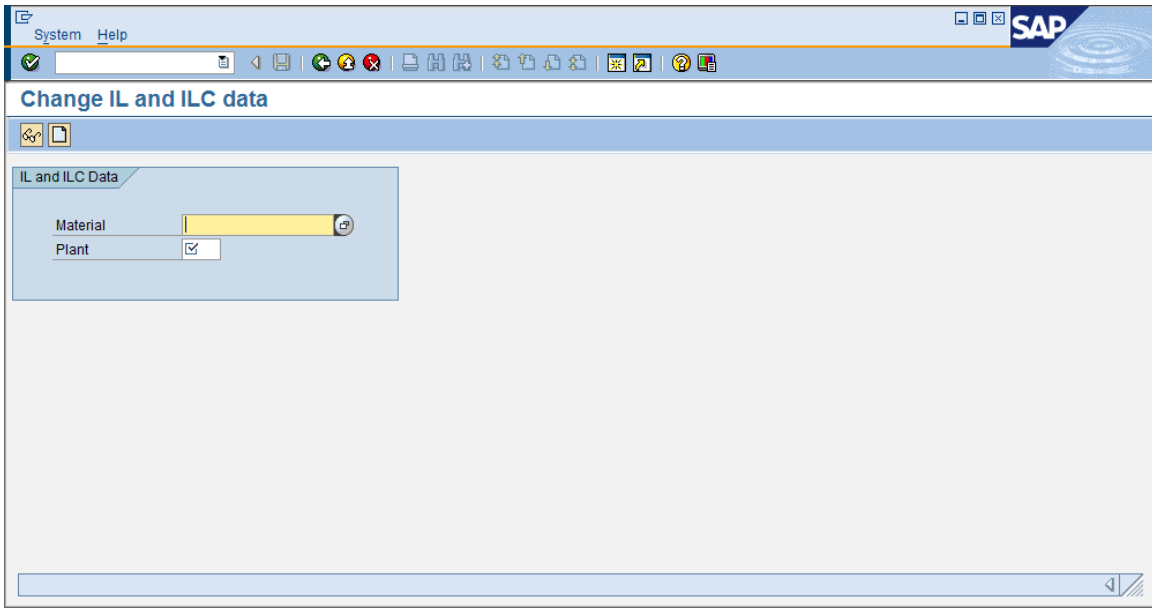


Figure 3-7 Change IL and ILC Data screen

2. Enter the Material and Plant information associated with the new data.
3. Click **Enter** button.
4. For Item Location Data (EIO1 tab), you can update any of the following fields:
   - Stocking Point Type
   - Inventory Allocation Policy
   - Annual Inventory Holding Cost (%)
   - Periods Between Reviews
   - Frozen Window
   - Total Lead Time Standard Deviation
   - Periods Between Shipments
   - Minimum Batch Size (Periods)
   - Service Level (%)
   - Standard/Moving Price (read-only)

- Unit Transfer Price

Note: The **Standard Price** read-only field provides validation for the Unit Transfer Price value. When entering a Unit Transfer Price value, only values greater than or equal to the Standard Price will be accepted.

- Service Time
- Minimum Service Level (%)
- Maximum Service Level (%)
- Lost Sales Percentage (%)
- Schedule Attainment
- Schedule Attainment CV

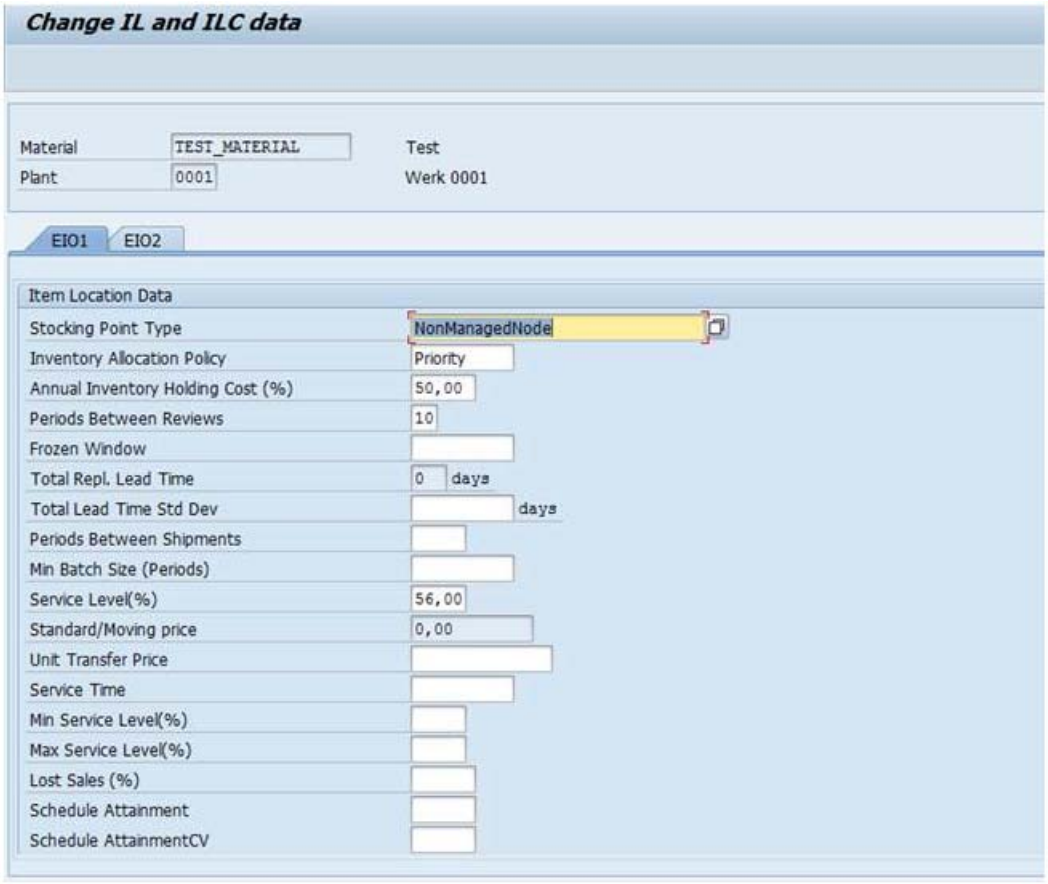


Figure 3-8 Change IL and ILC Data screen, EIO1 tab

Note: The **Inactive** field's check box defaults to unchecked. Use this field to mark inactive Item-Location pairs without losing any original data.

5. For Item Location Customer Data (EIO2 tab), you can update any of the following fields:
   - Service Level
   - Unit Transfer Price
   - Service Time
   - Minimum Service Level
   - Maximum Service Level
   - Lost Sales Percentage
   - Demand Interval
   - Lead Time Error
   - Mode

6. Click **Save** when you are finished adding data.

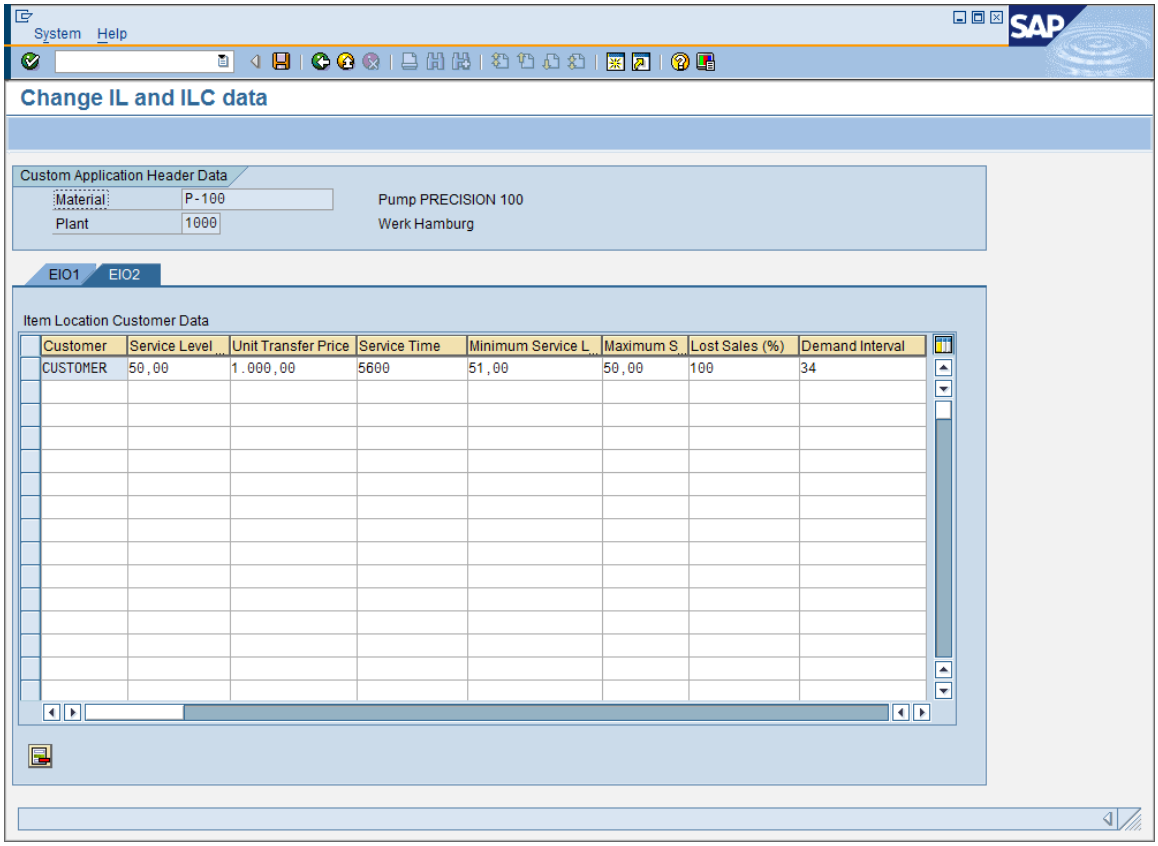


Figure 3-9 Change IL Data (EIO2) screen

Reviewing data in SAP

To review existing data to the Material Master in SAP, do the following:

1. Use the **/EIO/MM03** transaction. You should see the **Display IL and ILC Data** screen.

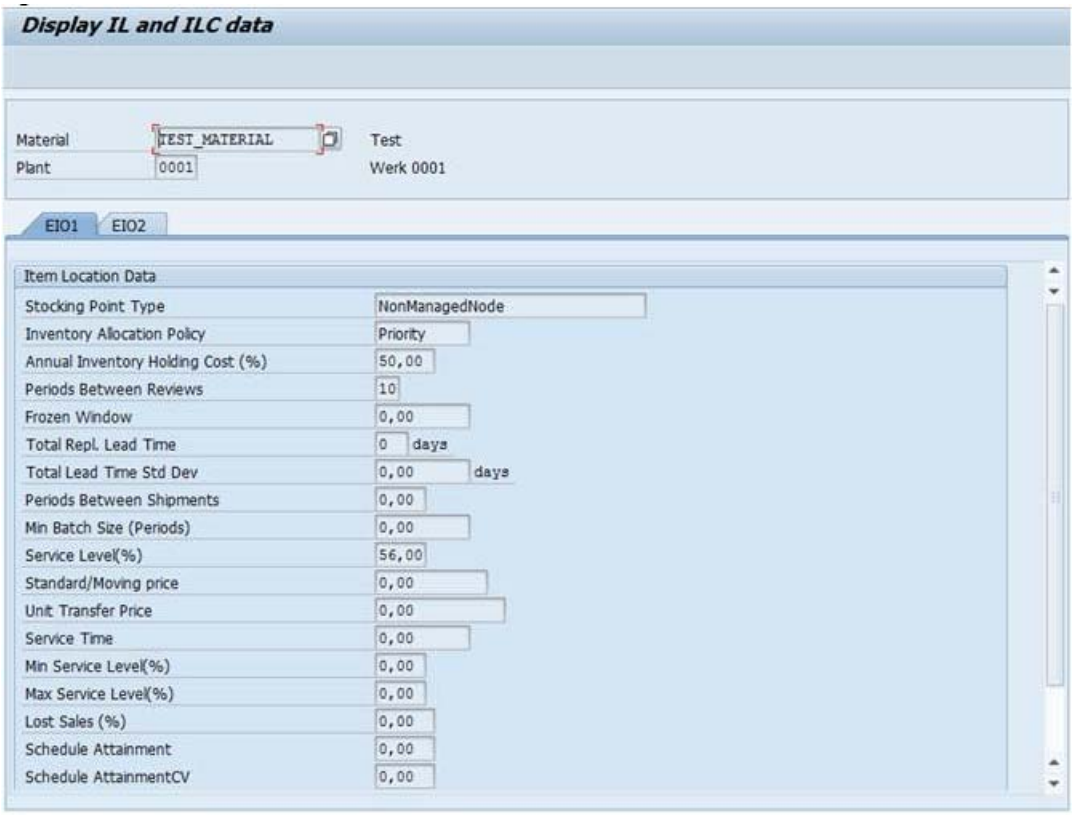


Figure 3-10 Display IL and ILC Data screen, EIO1 tab

2. Enter the Material and Plant information associated with the new data.
3. Click **Enter** button.
4. For Item Location Data (EIO1 tab), you can review the following fields:
   - Stocking Point Type
   - Inventory Allocation Policy
   - Annual Inventory Holding Cost (%)
   - Periods Between Reviews
   - Frozen Window
   - Total Lead Time Standard Deviation

- Periods Between Shipments
- Minimum Batch Size (Periods)
- Service Level (%)
- Standard/Moving Price (read-only)
- Unit Transfer Price

Note: The **Standard/Moving Price** read-only field provides validation for the Unit Transfer Price value.

- Service Time
- Minimum Service Level (%)
- Maximum Service Level (%)
- Lost Sales Percentage (%)
- Schedule Attainment
- Schedule Attainment CV

Note: The **Inactive** field's check box defaults to unchecked. Use this field to mark inactive Item-Location pairs without losing any original data.

5. For Item Location Customer Data (EIO2 tab), you can review the following fields:
   - Customer
   - Service Level
   - Unit Transfer Price
   - Service Time
   - Minimum Service Level
   - Maximum Service Level
   - Lost Sales Percentage
   - Demand Interval
   - Lead Time Error
   - Mode

6. Click **Exit** when you are finished reviewing data.

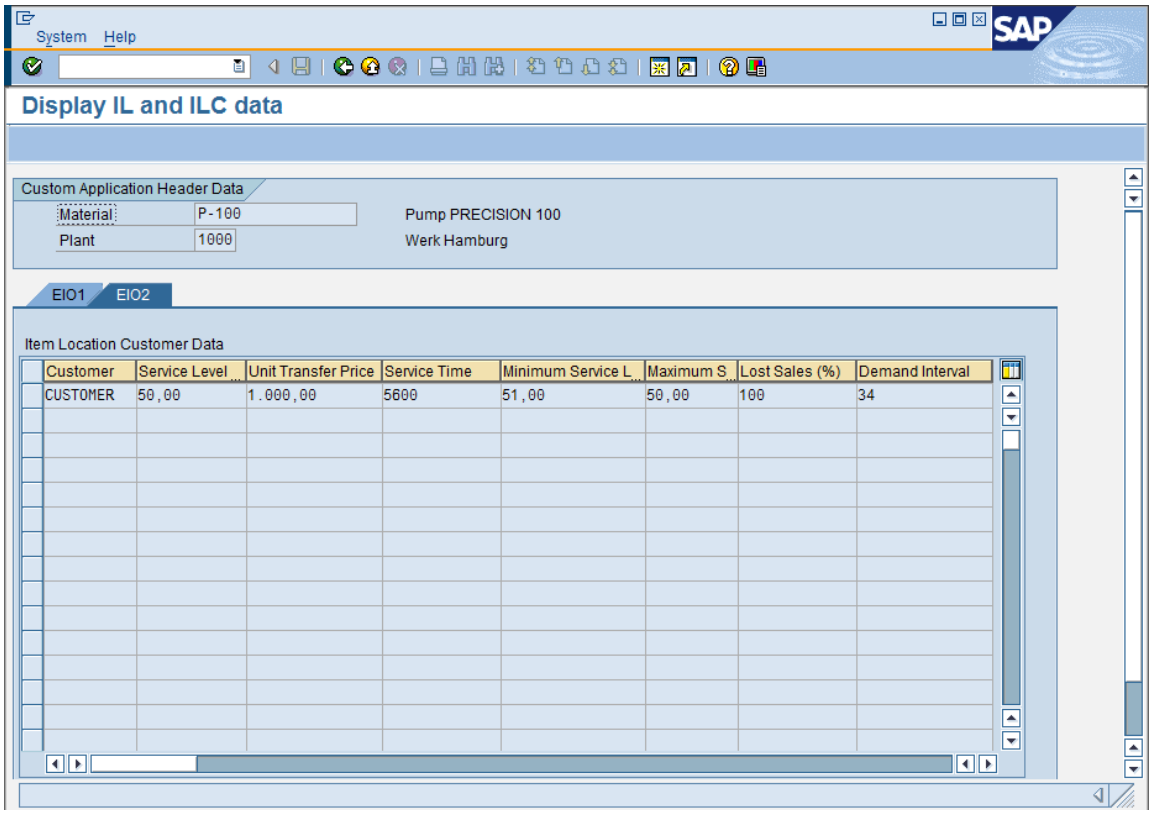


Figure 3-11 Display IL and ILC Data screen, EIO2 tab

Chapter 5: SAP Connector BAPI Details

The SAP Connector BAPIs facilitate integration between SAP data sources and EIS. The inbound BAPIs extract SAP input data from SAP master data tables to the Data Gateway. The outbound BAPI extracts output data from the Data Store to feed inventory targets in the SAP MM table.

Accessing BAPI code in SAP system

To access BAPI code in the SAP system's Function Builder screen, do the following:

1. Use the **SE37** transaction. You should see the Function Builder: Initial screen.

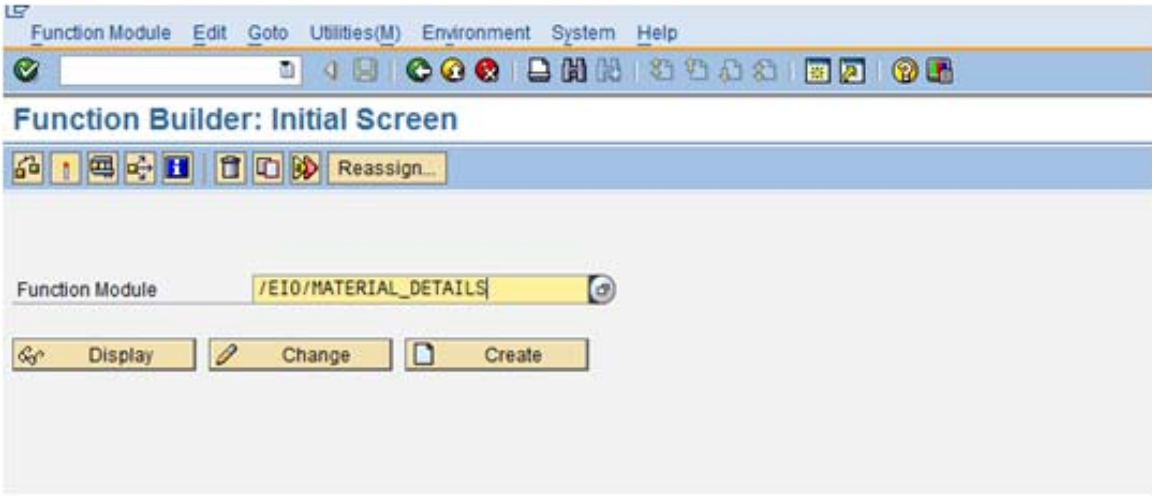


Figure 4-1 Function Builder: Intial screen

2. Enter the BAPI name in the **Function Module** field..
3. Click **Display**. The Function Builder: Display screen appears.
   You can review the BAPI code through the **Source Code** tab. You can also execute the BAPI code through the screen's menu functionality.

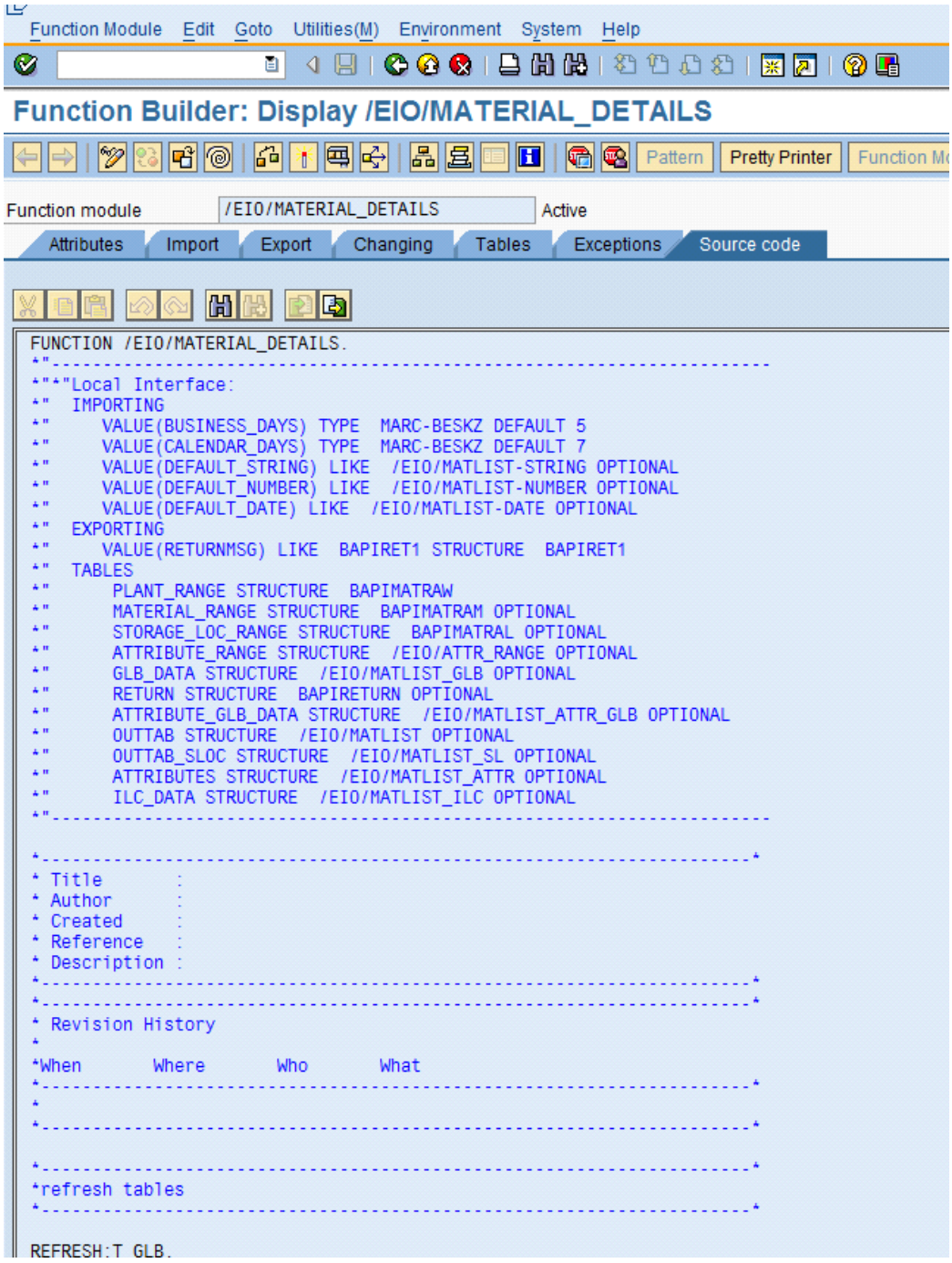


Figure 4-2 Function Builder: Display screen

Inbound BAPI Details (ECC)

The SAP Connector application includes the following inbound BAPIs:

- /EIO/MATERIAL_DETAILS
- /EIO/PLANT_DETAILS
- /EIO/VENDOR_DETAILS
- /EIO/SOURCING_DETAILS
- /EIO/SALES_DETAILS
- /EIO/BOM_DETAILS
- /EIO/FORECAST_DETAILS
- /EIO/HIST_PROD_DETAILS
- /EIO/PO_DETAILS

Note: Please refer to **SAP_Connector_610_Mapping.xlsx** for information on inbound BAPI mapping details.

BOM_DETAILS

The BOM_DETAILS BAPI includes the following filtering options:

- Filter parameters are limited to BOMUSAGE (default = 1)
- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level
  - Not flagged for deletion at plant level
  - Not flagged for deletion at BOM level
  - Not flagged as inactive in IL table
- STRING, NUMBER, and DATE columns to the ITEM table are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

FORECAST_DETAILS

The FORECAST_DETAILS BAPI includes the following filtering options:

- Filter parameters are limited to the following:
  - VERSION (default = 00)

- PERIOD_TYPE (default = W)
- SUPPLY_CHAIN_ID
- REVISION_DATE

NOTE: A null value for the period type parameter results in the BAPI defaulting to "W." An invalid period type results in the BAPI failing and writing an error message in the RETURN table

- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level
  - Not flagged for deletion at plant level
  - Not flagged as inactive in IL table
- STRING, NUMBER, and DATE columns in the FORECAST_VALUES tables are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

MATERIAL_DETAILS

The MATERIAL_DETAILS BAPI includes the following filtering options:

- Filter parameters are limited to the following:
  - BUSINESS_DAYS (default = 5)
  - CALENDAR_DAYS (default = 7)
  - PERIOD_TYPE (default = W)

  NOTE: A null value for the period type parameter results in the BAPI defaulting to "W." An invalid period type results in the BAPI failing and writing an error message in the RETURN table
  - All lead times (Total Repl Lead Ttime and Total Lead Time Std Dev) will be converted from days to the period type passed in the filter.

  NOTE: The Material Details BAPI uses BUSINESS_DAYS to calculate GRP_TIME and PRODUCTION_TIME, using the following logic:
  - For D – pass Time value
  - For W – divide original time value by business day
  - For M – divide original time value by ratio (business day/7)*30.5
  - For Q – divide original time value by ratio (business day/7)*91

  The Material Details BAPI uses CALENDAR_DAYS to calculate PROCESSING_TIME, TRANSIT_TIME, and LEAD_TIME_ERROR, using the following logic:

    - For D – pass Time value
    - For W – divide original time value by calendar day
    - For M – divide original time value by ratio (calendar day/7)*30.5
    - For Q – divide original time value by ratio (calendar day/7)*91
- Filtering occurs based on material-plants available in IL table and the following validations:
    - Not flagged for deletion at material level
    - Not flagged for deletion at plant level
    - Not flagged as inactive in IL table
- STRING, NUMBER, and DATE columns in the following tables are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples):
    - MATERIAL_DATA
    - MATERIAL_LOCATION_DATA
    - ILC_DATA
    - SHIP_TO

PLANT_DETAILS

The PLANT_DETAILS BAPI includes the following filtering options:

- Filtering occurs based on material-plants available in IL table and the following validations:
    - Not flagged for deletion at material level
    - Not flagged for deletion at plant level
    - Not flagged as inactive in IL table
- STRING, NUMBER, and DATE columns in the PLANT_ADDRESS table are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

SALES_DETAILS

The SALES_DETAILS BAPI includes the following filtering options:

- Filter parameters are limited to the following:
    - PERIOD_TYPE (default = W)
    - SUPPLY_CHAIN_ID

NOTES: A null value for the period type parameter results in the BAPI defaulting to "W." An invalid period type results in the BAPI failing and writing an error message in the RETURN table.

The Sales Details BAPI does aggregation calculations based on Period Type. For example, a Period Type of M will result in daily or weekly Sales Delivery Quantity data to be aggregated to a monthly value.

- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level
  - Not flagged for deletion at plant level
  - Not flagged as inactive in IL table
- STRING, NUMBER, and DATE columns in the DELIVERY_QUANTITY tables are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

SOURCING_DETAILS

The SOURCING_DETAILS BAPI includes the following filtering options:

- Filter parameters are limited to the following:
  - CALENDAR_DAYS (default = 7)
  - PERIOD_TYPE (default = W)

  NOTES: A null value for the period type parameter results in the BAPI defaulting to "W." An invalid period type results in the BAPI failing and writing an error message in the RETURN table

  The Sourcing Details BAPI uses CALENDAR_DAYS to calculate DURATION, using the following logic:
  - For D – pass Time value
  - For W – divide original time value by calendar day
  - For M – divide original time value by ratio (calendar day/7)*30.5
  - For Q – divide original time value by ratio (calendar day/7)*91
- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level
  - Not flagged for deletion at plant level
  - Not flagged as inactive in IL table

- STRING, NUMBER, and DATE columns in the SOURCETAB table are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

VENDOR_DETAILS

The VENDOR_DETAILS BAPI includes the following filtering options:

- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level
  - Not flagged for deletion at plant level
  - Not flagged as inactive in IL table
- STRING, NUMBER, and DATE columns in the VENDOR_DETAILS table are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

HIST_PROD_DETAILS

The HIST_PROD_DETAILS includes the following filtering options:

- Filter parameters are limited to the following:
  - SUPPLY_CHAIN_ID
  - DATE_RANGE
- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level
  - Not flagged for deletion at plant level
  - Not flagged as inactive in IL table

PO_DETAILS

The PO_DETAILS includes the following filtering options:

- Filter parameters are limited to the following:
  - SUPPLY_CHAIN_ID
  - DATE_RANGE
- Filtering occurs based on material-plants available in IL table and the following validations:
  - Not flagged for deletion at material level

- Not flagged for deletion at plant level
- Not flagged as inactive in IL table

- STRING, NUMBER, and DATE columns in the PO_DATA table are generic data fields provided to enable default field capabilities of the SAP Connector through the XML (see **SampleConfiguration.XML** file for examples).

Outbound BAPI Details (ECC)

Note: Please refer to **SAP_Connector_610_Mapping.xlsx** for information on outbound BAPI mapping details.

The SAP Connector application includes the following outbound ECC BAPI:

- /EIO/MATSAVE_DATA

MATSAVE_DATA

The MATSAVE_DATA includes the following filtering options:

- PERIOD_TYPE
- TARGET
- TARGET_FIELD
- FORECASTDATE
- STOCKING_POINT_DATA (Table)

  NOTES: If the TARGET left blank, it will be defaulted to 1. A non-valid value (1,2 or 3) results in BAPI failure and create a message in RETURN table.

  Here, TARGET value:

  - 1 refers to Safety Stock value in material master
  - 2 refers to Safety Time value in material master
  - 3 refers to Reorder point value in material master

  A null value for the PERIOD_TYPE parameter results in the BAPI defaulting to "W." An invalid period type results in the BAPI failing and writing an error message in the RETURN table