

SDN Community Contribution

(This is not an official SAP document.)

Disclaimer & Liability Notice

This document may discuss sample coding or other information that does not include SAP official interfaces and therefore is not supported by SAP. Changes made based on this information are not supported and can be overwritten during an upgrade.

SAP will not be held liable for any damages caused by using or misusing the information, code or methods suggested in this document, and anyone using these methods does so at his/her own risk.

SAP offers no guarantees and assumes no responsibility or liability of any type with respect to the content of this technical article or code sample, including any liability resulting from incompatibility between the content within this document and the materials and services offered by SAP. You agree that you will not hold, or seek to hold, SAP responsible or liable with respect to the content of this document.

Applies To:

Material Master Download to PCS

Summary

It has been agreed that there is a valid business requirement for Process Control Systems (PCS) to receive a message from SAP – via the Middleware - that contains Material Master Information.

By: Aveek Ghose

Company: Consultant, IBM India

Date: 04/08/2005

Table of Contents

Applies To:	2
Summary	2
Table of Contents	2
Introduction	4
Data Flow Diagram	6
Development Overview	7
Interface Overview	9
EDI Message Structure	10
EDI Message Example	11
Routing lookup table	19
Routing rule	19
Customizing for Material Master Download	20
Partner Profile in R/3 Box	20
Distribution Model	21
Technical Details	22
Transmission of Material Master Idoc from SDR to R/3	22

Inbound Processing	29
Changes to function module IDOC_INPUT_MATFET	30
Transmission of Material Master Idoc from R/3 to PCS	36
ALE/EDI Configuration	36
IDoc Modifications	36
User Exit / Enhancement Detailed Description	38
Author Bio	44

Introduction

It has been agreed that there is a valid business requirement for Process Control Systems (PCS) to receive a message from SAP – via the Middleware - that contains Material Master information.

The development also references the Process Control Integration document published that includes the following statement:

Material – The material number is a code that is used to uniquely identify a goods or service that is bought, sold, made or stored which may include; finished goods, raw and packaging materials, inter and intra factory materials, work in progress materials.

The following interfaces with SAP are supported by the client for factory integration (excluding QM and PM) -

IDOC's for the exchange of data with the MM module, which will include the exchange of material master data, and material handling transactions.

Material Master Message Generation

An IDOC message - will be generated in SAP and automatically sent to the Middleware every time a material is either:

Created

Changed

Deleted.

The message will be generated for any of the manufacturing related SAP material types as defined in the “*DS002 Material Type*” document

As agreed the format of the message will be IDOC.

Once generated in SAP, the IDOC will be automatically sent to the Middleware system. Once received by the Middleware system, the IDOC message will be routed straight through to the destination PCS.

Material Master Message Routing to PCS

Once the message has been received in the Middleware system, the message will be automatically routed to the correct destination PCS (Process Control System). A Plant based will determine the routing rule and routing table that are both held and maintained in the Middleware system.

It is essential that the Material Master broadcast IDOC message reaches the destination PCS in a timely manner so that the PCS has material details that are in alignment with

the material details held in SAP. This will help ensure the integrity of transactions executed by the PCS against a material.

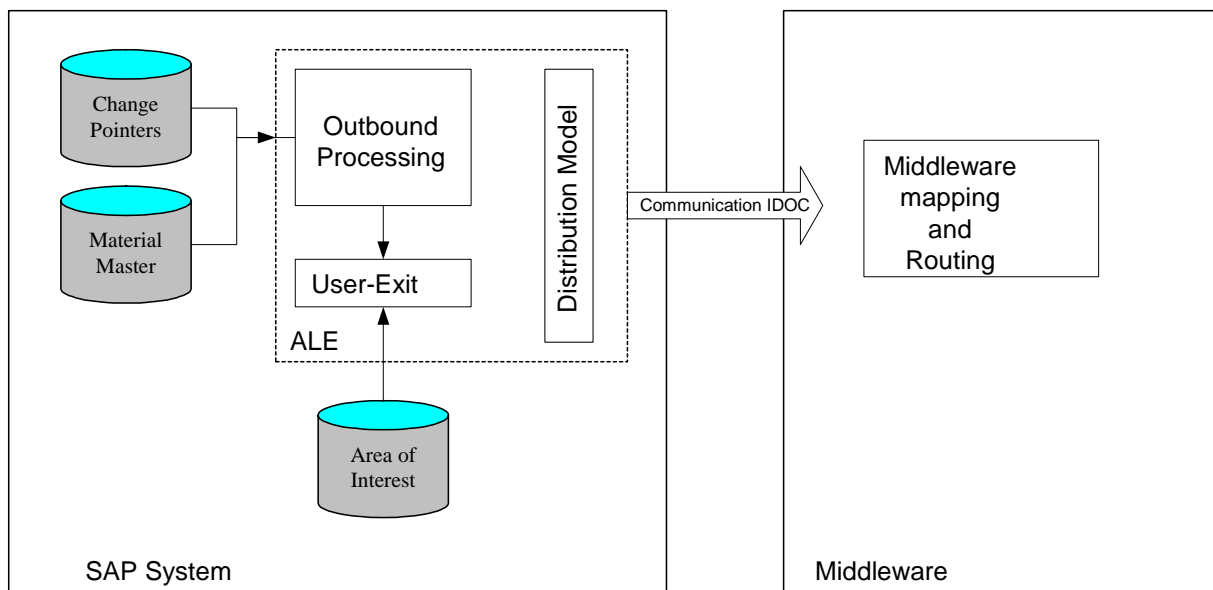
The processing of the message in the destination PCS is not covered in this specification.

Create, change or delete master record. First the user creates a new or maintains and existing master record by using the relevant transaction. This transaction automatically generates entries in the Change document and Change Pointer tables.

Transaction BD21 or the scheduled report RBDMIDOC creates Idocs based on entries in the change pointer table. This transaction also calls the MASTERIDOC_CREATE function module for the creation of individual master records. These function modules contain user exits that will be used to determine the list of logical system that the master record should be replicated to.

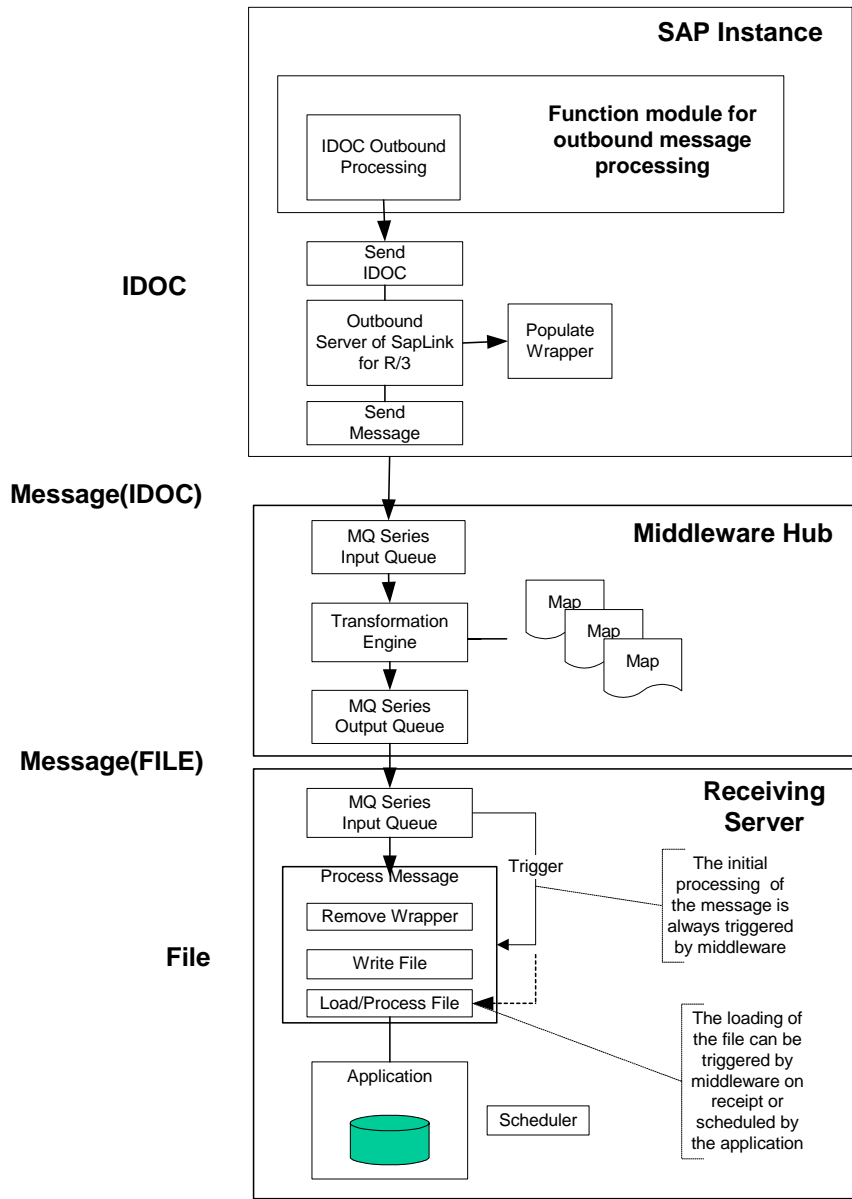
The Idocs are send to the middleware.

The Idocs are translated to EANCOM files and routed to recipients by the middleware



Data Flow Diagram

**Schematic Diagram of Outbound Interfaces
(Sample IDOC to message with file contents)**



Development Overview

Upon the generation of either a creation, change or deletion of material data in SAP, an IDOC should be generated and forwarded to the relevant receiving location in a near real time environment.

This IDOC will NOT be translated in the standard middleware system into an EANCOM PRODAT message, and will subsequently be sent straight through to the receiving Process Control System (PCS).

This message will provide detailed information about any change in material master data, enabling the local PCS to update its master data records accordingly.

Any changes to the master data on the SAP R/3 system (or MDR system) at any time have to be reflected in local PCS.

Material master information that is essential to the operation of the shop floor PCS includes information stored on the following views:

Basic data

Material number and description

Dimensions, weight and volume

Conversion factors between each of the packaging hierarchy levels and base unit of measure (alternative units of measure)

Basic data

Material number and description

Dimensions, weight and volume

Conversion factors between each of the packaging hierarchy levels and base unit of measure (alternative units of measure)

Plant /storage data

Shelf-life data

Storage conditions

General plant parameters

Warehouse data

Plant, Warehouse Number

Batch Management Indicator

Storage Strategy information

Palletization data

MRP data

Lot size data

Quality Management

Inspection Setup information

For this interface to function properly, 2 mechanisms should be in place:

1) Change log

Creation, update and deletions that are replicated from the MDR to SAP systems will have to be recorded and then re-distributed to the external PCS. The functionality will cover all online changes made to the Material Master in RLS system (MM01, MM02 and MM04) and by an update coming from MDR in the background. This change log will be used as basis for sending corresponding messages to any external PCS.

2) Filters

An external PCS should only be affected by changes to materials maintained in that plant. A plant is a criterion for distribution when a plant-material (SAP MARC table contains plant related data; key fields: MATNR, WERKS) combination exists in SAP. A

simple filter mechanism should be sufficient to determine where the changes should be sent.

Process overview:

On a periodic basis or when invoked from the menu, this development should trigger an outbound interface from the RLS system. The function should read all entries in the change pointer table and for each change of a field specified in the interface message, do the following:

- Populate the MATMAS Idoc with the revised material change

- Determine list of affected plants by scanning all occurrences of the material-plant combination

- Send the IDOC to the middleware system.

Interface Overview

SAP

Trigger Material Master Download Message with BD10.

IDoc Created with Header and Detail Information

TRFC Initiates IDoc Pass through ALE Adapter to Mercator/translator

Mercator/"Translator"

IDoc Information Mapped to Format for PCS

One message created for each Plant in the Message

Mercator Output delivered to Correct PCS Instance (SAP Plant)

PCS

Import File from SAP (through Mercator /"Translator")

Add to Current List of Material

EDI Message Structure

Product data message

Segment ID.	Page N°	Seg.No	Status	Max. Use	Segment Name	
UNH	4	1	M	1	MESSAGE HEADER	
BGM	5	2	M	1	Beginning of message	
DTM	6	3	M	10	Date/time/period	
SG4			C	99	NAD	
NAD	7	4	M	1	Name and address	
SG8			M	999	LIN-PIA-DTM-DTM-MEA-MEA-HAN-FTX-FTX-FTX-FTX-	
LIN	8	5	M	1	Line item	
PIA	9	6	C	10	Additional product id	
DTM	10	7	C	5	Date/time/period	Shelf Life
DTM	11	8	C	5	Date/time/period	Cycle count frequency
DTM	12	9	C	5	Date/time/period	Plant BBD Calculation
DTM	13	10	C	5	Date/time/period	Plant BBD Header
DTM	14	11	C	5	Date/time/period	Plant Fixed BBD
MEA	15	12	C	10	Measurements	Stacking Factor
MEA	16	13	C	10	Measurements	Storage Conditions
HAN	17	14	C	5	Handling instructions	Units of Measure
FTX	18	15	C	5	Free text	Stock Rotation
FTX	19	16	C	5	Free text	Stock Tracking
FTX	20	17	C	5	Free text	Cross Docking
FTX	21	18	C	5	Free text	Expiry date rounding
PGI	22	19	C	10	Product group	Mtl Type,Group & ABC
SG9			C	10	IMD	
IMD	23	20	M	1	Item description	
SG9			C	10	IMD	
IMD	24	21	M	1	Plant Label Header Text	
SG20			C	5	PAC-PCI	
PAC	25	22	M	1	Package	
PCI	26	23	C	5	Package identification	Durability type
SG21			C	999	HYN-QTY-SG23	
HYN	27	24	M	1	Hierarchy information	GTIN (this level)
QTY	28	25	C	5	Quantity	Pack Factor
SG23			C	99	CCI-CAV-CAV-CAV-MEA-MEA-MEA-MEA	
CCI	29	26	M	1	Characteristic/class id	

CAV	30	27	C	10	Characteristic value	GTIN Variant
CAV	31	28	C	10	Characteristic value	UOM (this level)
MEA	32	29	C	10	Measurements	Pack Height
MEA	33	30	C	10	Measurements	Pack Length
MEA	34	31	C	10	Measurements	Pack Width
MEA	35	32	C	10	Measurements	Pack Volume
MEA	36	33	C	10	Measurements	Gross & Net Weights
UNT	37	34	M	1	MESSAGE TRAILER	

EDI Message Example

Material Master from Client to Vendor for delivery to PCS Plant.

UNA:+.? '

UNB+UNOB:3+9300605000001:14+9377778003481:14+991011:1401+00000000004863'

UNH+ME000001+PRODAT:D:96A:EN:EAN002'

BGM+11E::9+87441+9'

DTM+137:200206011059:203' Message Date (&Time)

NAD+MR+5071615111110::9' Global Location Number of receiver of message

NAD+MS+5098765111111::9' Global Location Number of sender of message

LIN+1+1' Line 1 - record to be added
- FIRST MATERIAL

PIA+1+12290:SA' Material number is 12290

DTM+363:730:804' Shelf Life = 730 Days

DTM+364:60:804' Minimum remaining shelf life required for despatch,
60 days

DTM+40E:60:804' Cycle Count (Frequency) = 60 Days

DTM+ZPC:01' Plant Best Before Date Calculation = 01 Fixed Best
Before Date

DTM+ZPF:01' 01 None	Plant Human Readable Best Before Date Format =
DTM+36:20031101:102'	Plant Fixed Best Before date 01-Nov-2003
MEA+SO+AEB+D97:5'	Stack Height of PALLET = 5 (Pallets)
MEA+SO+TC::42'	Storage Temperature = Ambient
HAN+BU::91:EA+ADR' used)	Base UoM is EA, and is hazard coded (if
HAN+OU::91:D97'	Order Unit is PALLET
HAN+SU::91:LR'	Sales Unit is level LAYER
HAN+WU::91:CS'	Warehouse Unit is CASE
HAN+PU::91:CS'	Production Unit is CASE
FTX+AAN:1+RDT::91+U'	Rotadate type = "U" Use-By-Date
FTX+AAN:1+TLN::91+Y'	Track by Lot Number = "Y"
FTX+AAN:1+XDK::91+N'	Cross-Dock "N"
FTX+PAC:1+EDR::91+S'	Expiry Date Rounding Rule is Start of Period
PGI+11+:185:91:FERT'	Material Type "FERT"
PGI+11+:175:91:F60'	Material Group F60
IMD+F+ANM+:::SKIPPA 100GX12:EN'	Material Description in English
IMD+F+ZPL+:::DOLLY:EN'	Plant Label Header Text
PAC+1	
PCI+38E' from BBD format	Marked with Expiry date (EAN Code) To be derived
HYN+P+P++5410013111009:EN::9'	Packaging Hierarchy indicator and GTIN for this level
CCI+PCM'	Trigger segment for following CAV-MEA
CAV+PV::91:02'	GTIN Product Variant N° " 02 "

CAV+UOM::91:EA' Unit of Measure this level is Each
 MEA+PD+HT+MMT:15' Pack Height = 15 mm
 MEA+PD+LN+MMT:15' Pack Length = 15 mm
 MEA+PD+WD+MMT:100' Pack Width = 100 mm
 MEA+PD+ABJ+MMQ:0.001' Pack Volume = 0.001 Cubic Metres
 MEA+AAE+AAB+KGM:0.022' Pack Gross Weight = 0.022 Kg
 MEA+AAE+ADZ+KGM:0.010' Pack Net Weight = 0.010 Kg
 HYN+P+C++5410013111016:EN::9' Packaging Hierarchy indicator and GTIN for this level
 QTY+17E:24' There are 24 of the previous level (Consumer) Units
 in this level, (Display)
 CCI+PCM' Trigger segment for following CAV-MEA
 CAV+PV::91:00' GTIN Product Variant N° " 00 "
 CAV+UOM::91:DS' Unit of Measure this level is DISPLAY
 MEA+PD+HT+MMT:60' Pack Height = 60 mm
 MEA+PD+LN+MMT:45' Pack Length = 45 mm
 MEA+PD+WD+MMT:200' Pack Width = 200 mm
 MEA+AAE+AAB+KGM:0.55' Pack Gross Weight = 0.550 Kg
 MEA+AAE+ADZ+KGM:0.24' Pack Net Weight = 0.240 Kg.
 HYN+P+C++5410013111023:EN::9' Packaging Hierarchy indicator and GTIN for this level
 QTY+17E:8' There are 8 of the previous level (Display) Units
 in this level, (Case)
 CCI+PCM' Trigger segment for following CAV-MEA
 CAV+PV::91:07' GTIN Product Variant N° " 07 "
 CAV+UOM::91:CS' Unit of Measure this level is CASE

MEA+PD+HT+MMT:120'	Pack Height = 120 mm
MEA+PD+LN+MMT:180'	Pack Length = 180 mm
MEA+PD+WD+MMT:200'	Pack Width = 200 mm
MEA+AAE+AAB+KGM:5.2'	Pack Gross Weight = 5.200 Kg
MEA+AAE+ADZ+KGM:1.92'	Pack Gross Weight = 1.920 Kg
HYN+P+C' this level	Packaging Hierarchy indicator, no GTIN at this level
QTY+45E:200' Units	There are 200 of the previous level (Case) in this level, (Pallet)
CCI+PCM'	Trigger segment for following CAV-MEA
CAV+UOM::91:D97'	Unit of Measure this level is PALLET
MEA+PD+HT+MMT:1050'	Pallet Height = 1050 mm
MEA+PD+LN+MMT:800'	Pallet Length = 800 mm
MEA+PD+WD+MMT:1200'	Pallet Width = 1200 mm
MEA+AAE+AAB+KGM:1085'	Pallet Gross Weight = 1085.000 Kg
MEA+AAE+ADZ+KGM:384'	Pallet Net Weight = 384.000 Kg
LIN+2+3' - NEXT MATERIAL	Line 2 - record to be updated
PIA+1+12292:SA'	Material number is 12292
DTM+363:24:802'	Shelf Life = 24 Months
DTM+364:21:804' 21 days	Minimum remaining shelf life required for despatch, 21 days
DTM+40E:120:804'	Cycle Count (Frequency) = 120 Days
MEA+SO+AEB+D97:1'	Stack Height of PALLET = 1 (Pallets)
MEA+SO+TC::42'	Storage Temperature = Ambient
HAN+BU::91:EA+ADR'	Base UoM is EA, and is hazard coded
HAN+OU::91:D97'	Order Unit is PALLET

HAN+SU::91:CS'	Sales Unit is level CASE
HAN+WU::91:CS'	Warehouse Unit is CASE
HAN+PU::91:EA'	Production Unit is EACH
FTX+AAN:1+RDT::91+U'	Rotadate type = "U" Use-By-Date
FTX+AAN:1+TLN::91+Y'	Track by Lot Number = "Y"
FTX+AAN:1+XDK::91+N'	Cross-Dock "N"
FTX+PAC:1+EDR::91+E'	Expiry Date Rounding Rule is End of Period
PGI+11+:175:91:F45'	Material Group F45
PGI+11+:185:91:FERT'	Material Type "FERT"
IMD+F+ANM+:::WORKING DOG 20KG:EN'	Material Description in English
IMD+F+ANM+::: ARBEITENDEN HUND 20KG:DE'	Material Description in German
PAC+1	
PCI+39E'	Marked with Best Before date (EAN Code)
HYN+P+P++5410013111092:EN::9'	Packaging Hierarchy indicator and GTIN for this level
CCI+PCM'	Trigger segment for following MEA
CAV+PV::91:00'	GTIN Product Variant N° " 00 "
CAV+UOM::91:BG'	Unit of Measure this level is BAG.
MEA+PD+HT+MMT:750'	Pack Height = 750 mm
MEA+PD+LN+MMT:350'	Pack Length = 350 mm
MEA+PD+WD+MMT:200'	Pack Width = 200 mm
MEA+PD+ABJ+MMQ:0.020'	Pack Volume = 0.020 Cubic Metres
MEA+AAE+AAB+KGM:20.5'	Pack Gross Weight = 20.500 Kg
MEA+AAE+ADZ+KGM:20'	Pack Net Weight = 20.000 Kg
HYN+P+C'	Packaging Hierarchy indicator, no GTIN at this level

		Plant Fixed BBD
8	MEA	Stack Height (Pallets) Storage Temperature (Category or °C)
8	HAN	Base Level UoM + hazcode Order Level UoM Sales Level UoM Warehouse Level UoM Production UoM
8	FTX	Rotate by Date-Type (UBD or BB4) Track by Lot N° Cross Dock Flag Expiry Date Rounding Rule
8	PGI	Material Type Material Group ABC Code
9	IMD	Material Description
9	IMD	Plant Label Header Text
20	PAC	(trigger for PCI)
	PCI	Use-By / Best Before Indicator

Detail BaseUoM loop

21	HYN	Packaging Hierarchy starting from Base UoM as "Parent" and GTIN for this level
23	CCI	(trigger for CAV-MEA loop)

23	CAV	GTIN Variant at this level UOM code at this level
23	MEA	Pack Length & length UoM Pack Height & Height UoM Pack Width & Width UoM Pack Volume UoM (Measured) Gross Weight & Weight UoM Net Weight & Weight UoM
Detail AlternateUoM loop		
21	HYN	Packaging and GTIN for this level
21 required at Parent level)	QTY	Number of lower level units in this level (not
23	CCI	(trigger for CAV-MEA loop)
23	CAV	GTIN Variant at this level UOM code at this level
23 required at Alt UoM)	MEA	Pack Length & length UoM Pack Height & Height UoM Pack Width & Width UoM (Volume not Gross Weight & Weight UoM Net Weight & Weight UoM

Routing lookup table

The Middleware routing will reuse the routing file LogicalSystem_Lookup_UNI.txt. The routing logic for this interface will work as follows:

Sending System	Routing Rules	Destination System
E1MARCM - WERKS	Retrieve one delivery ID and delivery GID through a lookup using a combination of source ID, transaction ID and plant ID as the key fields	Identified by delivery ID

If batches of Idocs are sent, only the plant of the first Idoc needs in the batch needs to be looked up. Since there is a separate partner profile for each PCS plant through which dispatches of Idoc batches are channeled, it is assured that one Idoc batch can only have one recipient plant. The whole batch can be sent as one piece of data.

Routing rule

A lookup table is used

Read the Idoc field EDIDC-RCVPRN

Read the MW lookup table where Idoc field EDIDC-RCVPRN = Logical system

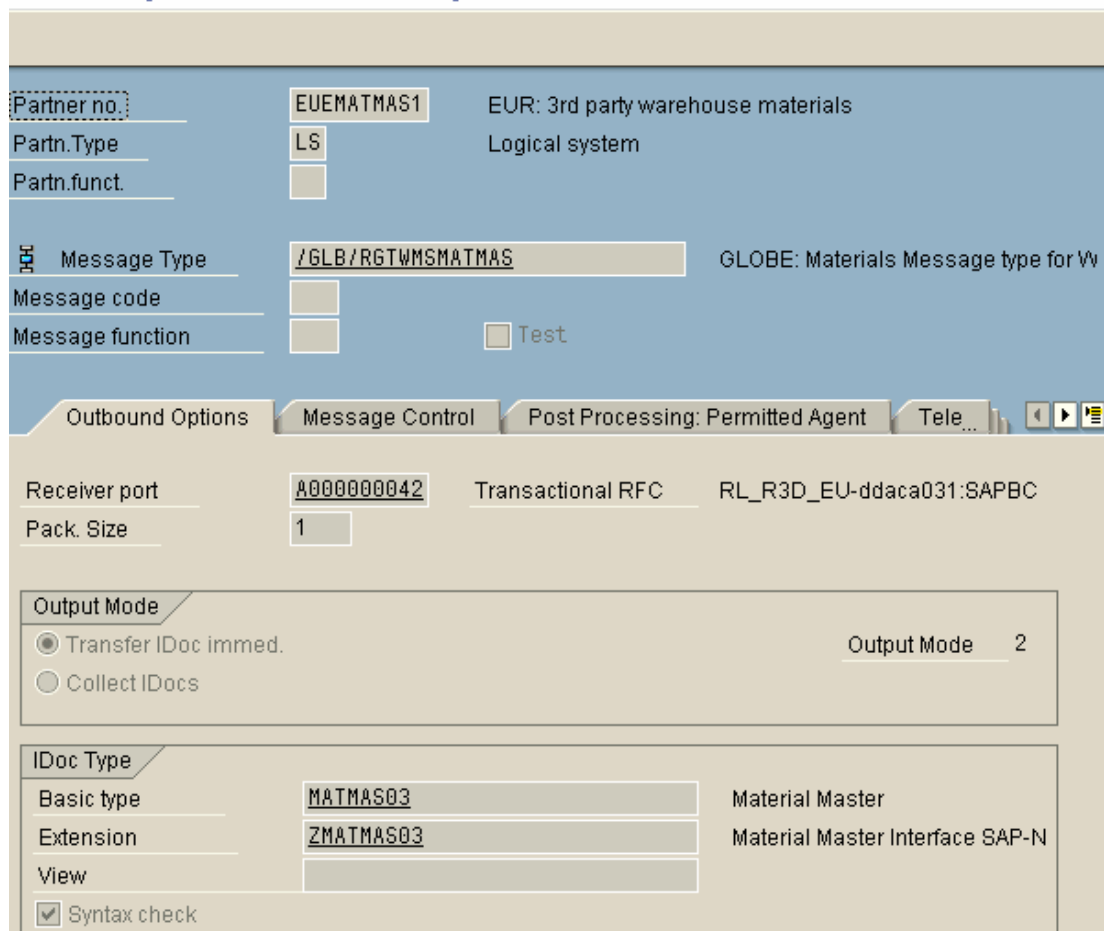
If Mapping field = EANCOM, map the Idoc to an EANCOM message and send it to the Delivery GID / Delivery ID of the lookup table

The corresponding GLN code will be populated in the EANCOM message

Customizing for Material Master Download

Partner Profile in R/3 Box

Partner profiles: Outbound parameters



The screenshot shows the SAP configuration screen for Partner Profile Outbound Parameters. The main area is divided into several sections:

- Partner no.:** EUEMATMAS1 (EUR: 3rd party warehouse materials)
- Partn.Type:** LS (Logical system)
- Partn.funct.:** (Empty)
- Message Type:** /GLB/RGTWMSMATMAS (GLOBE: Materials Message type for W)
- Message code:** (Empty)
- Message function:** (Empty) Test

Navigation tabs: Outbound Options, Message Control, Post Processing: Permitted Agent, Tele...

Receiver port: A000000042 **Transactional RFC:** RL_R3D_EU-ddaca031:SAPBC

Pack. Size: 1





Output Mode:

- Transfer IDoc immed. **Output Mode 2**
- Collect IDocs

IDoc Type:

- Basic type:** MATMAS03 (Material Master)
- Extension:** ZMATMAS03 (Material Master Interface SAP-N)
- View:** (Empty)
- Syntax check

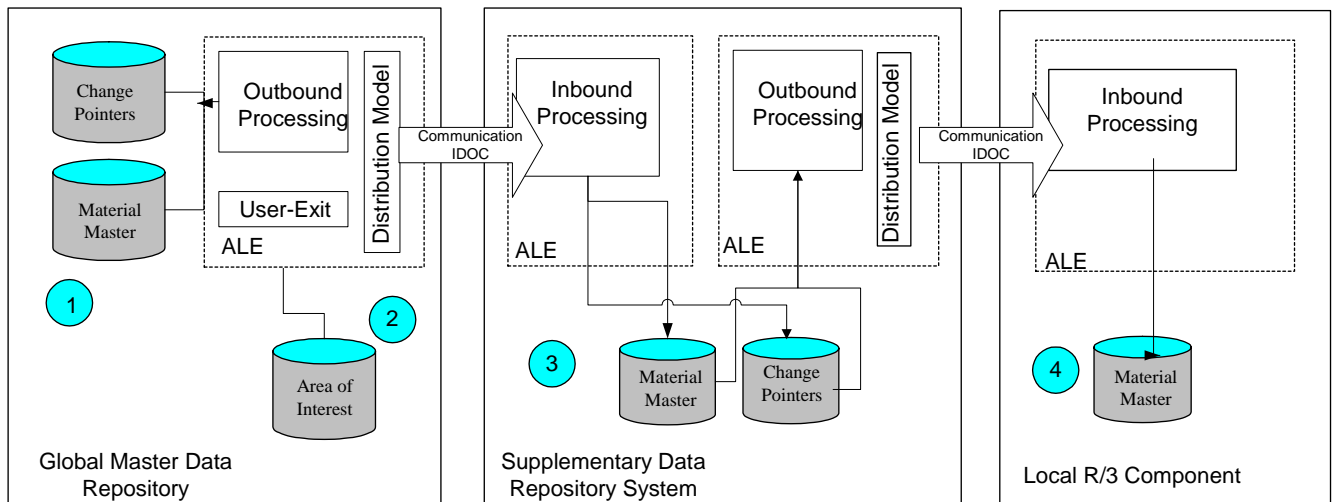
Distribution Model

▼  DR_WMS_02	DR_WMS_02
▼  BTC:RLv1.5.DV.R3C - Client 103	RD2DVR3103
▼  EUR: 3rd party warehouse materials	EUEMATMAS1
▶  /GLB/RGTWMSMATMAS	GLOBE: Materials Message type for WMS Interface
▶  EUR: UK SAP: 000	RD15EU0004

Technical Details

Transmission of Material Master Idoc from SDR to R/3

The following diagram describes of the overall process flow for the replication of the material master data from the MDR system to SDR and then the local R/3 components;



The following steps refer to the diagram:

Create, maintain or delete the material master in the MDR. First the MDR user creates a new, or maintains an existing, master record by using the relevant transaction (MM01, MM02, MM06). This process is controlled through workflow as per the data standards guidelines. This transaction automatically generates entries in the Change document and Change Pointer tables.

Note: the deletion process for materials requires that the deletion flags are at first manually set at a local organization level (Plant, Sales Org, Warehouse etc.) and at a client level in the SDR and local systems before the flag is set at the MDR level. However, once updated in the MDR the change (as for any maintained fields) should be replicated automatically to all relevant systems.

An area of interest (AOI) must then be assigned to the material records. A custom transaction is used for this purpose (ZAOI1). The approval of the AOI then triggers the creation of the IDOC. Transaction BD21 or the scheduled report RBDMIDOC creates IDocs based on entries in the change pointer table. The assignment of the AOI enables the data to be sent only to the selected SDRs as required.

Note: If a material with an AOI assigned and approved earlier is being updated (i.e. Maintained material) then the IDOC will be automatically created and distributed to the same AOI.

The Idocs are sent to the SDR system taking into account the sequence of prerequisite data. Multiple Idocs are to be processed in the same sequence as the Idoc creation. The inbound processing of the IDOC will generate change pointers to enable the creation of the IDOCs for further replication to the lower levels. Additional maintenance (or flag for deletion) of the material master will take place in the SDR generating corresponding change pointers. IDOC filtering based on Sales Org, Plant and Warehouse will be used to control the data sent to each system on the local level. Transaction BD21 or the scheduled report RBDMIDOC creates Idocs based on entries in the change pointer table.

The Idocs are received in the local R/3 system again in the same sequence as Idoc creation, and no further processing is required.

Note: This document is concerned with the final stages of this process – steps 3 through 4.

1 – FM Masteridoc_create_matmas

This FM is called in the outbound processing.

2 – Call customer function EXIT_SAPLMV01_002 and in include ZXMGVU03, comment out the existing code (for MDR to other systems).

3 – Extend this include with the new outbound data processing

In the new Customer function, the new outbound data processing has to be build.

WHEN C_MESTYP_ZMATMAS.

* Fill object key field needed to call filter function

CASE SEGMENT_NAME.

WHEN C_SEGMENT_E1MARAM.

E1MARAM = IDOC_DATA-SDATA.

V_OBJKEY = E1MARAM-MATNR.

* Fill segment Z1YAMARA with the Client specific material master data

CLEAR IDOC_DATA.

```
IDOC_DATA-SEGNAM = C_SEGMENT_Z1YAMARA.  
MOVE-CORRESPONDING F_MARA TO Z1YAMARA.  
MOVE Z1YAMARA TO IDOC_DATA-SDATA.  
APPEND IDOC_DATA.
```

```
WHEN C_SEGMENT_E1MARCM.
```

```
Include /XYZ/RGT_fill_seg_z1mapem.  
Include /XYZ/RGT_fill_seg_z1maexm.
```

- * Fill additional segment/s for MDMA/DPOP data if required.
MOVE IDOC_DATA-SDATA TO E1MARCM.
L_WERKS = E1MARCM-WERKS.
LOOP AT IDOC_DATA WHERE SEGNAM = C_SEGMENT_E1MARAM.
E1MARAM = IDOC_DATA-SDATA.
L_MATNR = E1MARAM-MATNR.
ENDLOOP.
- * Set back to MARC segment, just in case.
LOOP AT IDOC_DATA WHERE SEGNAM = C_SEGMENT_E1MARCM.
MOVE IDOC_DATA-SDATA TO E1MARCM.
IF E1MARCM-WERKS = L_WERKS.
EXIT.
ENDIF.
ENDLOOP.
- * START OF R011.
SELECT * FROM MDMA INTO L_MDMA WHERE MATNR = L_MATNR
AND WERKS = L_WERKS.


```
*      Get related DPOP data.
CLEAR L_DPOP.
SELECT SINGLE BERTY FROM MDLV INTO L_BERTY
      WHERE BERID = L_MDMA-BERID.
IF SY-SUBRC = 0.
  CALL FUNCTION 'DPOP_SINGLE_READ'
    EXPORTING
      MATNR    = L_MATNR
      WERKS    = L_MDMA-WERKS
      BERID    = L_MDMA-BERID
      BERTY    = L_BERTY
    IMPORTING
      WDPOP    = L_DPOP
    EXCEPTIONS
      NOT_FOUND = 1
      WRONG_CALL = 2
      OTHERS   = 3.
IF SY-SUBRC <> 0.
  CLEAR L_DPOP.
ENDIF.
ENDIF.
CLEAR IDOC_DATA.
IDOC_DATA-SEGNAM = C_SEGMENT_Z1MDMAM.
MOVE-CORRESPONDING L_DPOP TO Z1MDMAM.
MOVE-CORRESPONDING L_MDMA TO Z1MDMAM.
MOVE L_DPOP-PROPR TO Z1MDMAM-PROPR2.
Z1MDMAM-MATNR = L_MATNR.
MOVE Z1MDMAM TO IDOC_DATA-SDATA.
```

```
        APPEND IDOC_DATA.
    ENDSELECT.
*   END OF R011.

* Fill segment Z1MARCM with the Client specific material plant data
    CLEAR IDOC_DATA.
    IDOC_DATA-SEGNAM = C_SEGMENT_Z1MARCM.
    MOVE-CORRESPONDING F_MARC TO Z1MARCM.

    MOVE Z1MARCM TO IDOC_DATA-SDATA.
    APPEND IDOC_DATA.

* Change purchasing group value to "/" (nodata) if its space
* Lets find the correct segment in table IDOC_DATA
    LOOP AT IDOC_DATA WHERE SEGNAM = C_SEGMENT_E1MARCM.
        MOVE IDOC_DATA-SDATA TO E1MARCM.
        CHECK: E1MARCM-WERKS = F_MARC-WERKS.
        IF E1MARCM-EKGRP = SPACE.
            E1MARCM-EKGRP = C_REDUCE.
        ENDIF.
        MOVE E1MARCM TO IDOC_DATA-SDATA.
        MODIFY IDOC_DATA.
    ENDLOOP.

    WHEN C_SEGMENT_E1MVKEM.

* Fill segment Z1MVKEM with the Client specific material sales data
```

```
CLEAR IDOC_DATA.  
IDOC_DATA-SEGNAM = C_SEGMENT_Z1MVKEM.  
MOVE-CORRESPONDING F_MVKE TO Z1MVKEM.  
MOVE Z1MVKEM TO IDOC_DATA-SDATA.  
APPEND IDOC_DATA.
```

* End of change : MOD-010

```
WHEN C_SEGMENT_E1MBEWM.
```

* Lets find the correct segment in table IDOC_DATA

```
LOOP AT IDOC_DATA WHERE SEGNAM = C_SEGMENT_E1MBEWM.  
MOVE IDOC_DATA-SDATA TO E1MBEWM.  
CHECK: E1MBEWM-BWKEY = F_MBEW-BWKEY AND  
E1MBEWM-BWTAR = F_MBEW-BWTAR.
```

* If standard price is valid reduce moving average price and vice versa

```
CASE E1MBEWM-VPRSV.  
WHEN C_S.  
E1MBEWM-VERPR = C_REDUCE.  
WHEN C_V.  
E1MBEWM-STPRS = C_REDUCE.  
ENDCASE.  
MOVE E1MBEWM TO IDOC_DATA-SDATA.  
MODIFY IDOC_DATA.  
ENDLOOP.
```

* Call the filter function module after the idoc has been completely

* created!!!

```
WHEN SPACE.
```

* Assign the correct idoc type only once after the idoc has been

* completely created!!!

```
IDOC_CIMTYPE = C_CIMTYP. "ZMATMA07'
```

```
CLEAR WA_EDIDC.
```

```
WA_EDIDC-MESTYP = MESSAGE_TYPE.
```

```
WA_EDIDC-IDOCTP = C_DOCTYP.
```

```
WA_EDIDC-CIMTYP = C_CIMTYP.
```

```
CALL FUNCTION '/XYZ/XGT_ZDISTR2_POPULATE'
```

```
EXPORTING
```

```
EDIDC          = WA_EDIDC
```

```
OBJECT_TYPE    = C_OJ_BUS1001
```

```
OBJECT_KEY     = V_OBJKEY
```

```
LOGSYS_FLAG    = 'X'
```

```
FILTEROBJ_FLAG = 'X'
```

```
UPDATE_IDOCDATA = 'X'
```

```
TABLES
```

```
ZDISTR2       = I_ZDISTR2
```

```
IDOC_DATA     = IDOC_DATA
```

```
EXCEPTIONS
```

```
INCORRECT_MESSAGE_TYPE = 1
```

```
INCORRECT_OBJECT_TYPE = 2
```

```
NO_DATA_RETURNED      = 3.
```

```
ENDCASE.
```

Inbound Processing

Create ZIDOC_INPUT_MATMAS01 that calls the FM idoc_input_matmas01 and extend this new FM with the following logic :

1 – Create message type ZMATMAS

This message type is passed from the outbound processing.

2 – Check for material to be created in table MARA

If the material already exists then the normal update of the material will take place; if mara exists then the FM IDOC_INPUT_MATMAS01 is called.

3 – Check for material to be created in table /XYZ/XGTTTMPKEY

If the material exists you know you have the complete material master idoc so the normal update of the material should take place. If the material exists in table /XYZ/XGTTTMPKEY the FM IDOC_INPUT_MATMAS01 is called.

Delete the found entry from table /XYZ/XGTTTMPKEY after the idoc is processed correctly to minimize the amount of entries in this table.

4 – Store material in table /XYZ/XGTTTMPKEY if material does not exist in MARA and not in /XYZ/XGTTTMPKEY

Now you know that the idoc you are processing does not contain the full material master data (reduced idoc!!). You have to create the MATFET idoc to request the full material master idoc from SDR.

Set the idoc status of the not processed reduced idoc to 68 (Error – no further processing).

Table: /XYZ/XGTTTMPKEY

Field Name	Data Element	Type	Lenght	Field description	Key
MANDT	MANDT	CLNT	3	Client	X
OBJTYPE	SWO_OBJTYP	CHAR	10	Client	X
OBJKEY	SWO_TYPEID	CHAR	70	Object type	X

5 – Run program RBDFFEMAT

This programs runs to create the IDOC MATFET on the local box.

6 – Copy FM IDOC_INPUT_MATFET to /XYZ/xgt_IDOC_INPUT_MATFET

This function module fetches the basic data from the SDR for the specific material by creating an IDOC at SDR that is sended to the local box.

Changes to function module IDOC_INPUT_MATFET

* Messagetype

DATA: C_MESTYP_MATCOR LIKE BDALEDC-MESTYP VALUE 'MATCOR'.

DATA: C_MESTYP_MATMAS LIKE BDALEDC-MESTYP VALUE 'MATMAS'.

DATA: C_MESTYP_OILMAT LIKE BDALEDC-MESTYP VALUE 'OILMAT'."IS-Oil KH

DATA: C_MESTYP_ZMATMAS LIKE BDALEDC-MESTYP VALUE 'ZMATMAS'.

* original message type MATMAS

WHEN C_MESTYP_ZMATMAS.

```
CLEAR T_MARA_MATSEL.  
REFRESH T_MARA_MATSEL.  
CLEAR T_MARA_SELLIST.  
REFRESH T_MARA_SELLIST.  
CLEAR T_MATKEY.  
REFRESH T_MATKEY.  
CLEAR T_KSSK.  
REFRESH T_KSSK.
```

select all material

```
DESCRIBE TABLE T_SELECT_OPTIONS_MATNR LINES SY-TABIX.  
IF SY-TABIX > 0.  
    SELECT * FROM MARA INTO TABLE T_MARA_MATSEL  
        WHERE MATNR IN T_SELECT_OPTIONS_MATNR.  
  
ENDIF.
```

* select all material from listing

```
DESCRIBE TABLE T_SELECT_OPTIONS_CLASS LINES SY-TABIX.  
IF SY-TABIX > 0.  
    CALL FUNCTION 'CLASSTYPE_FOR_MESSAGETYPE_GET'  
        EXPORTING  
            MESSAGE_TYPE           = F_SELECT_MESTYP-MESTYP  
        IMPORTING  
            DISTRIBUTION_CLASS_TYPE = KLART  
    EXCEPTIONS  
        NO_CLASSOBJECT_FOR_THIS_MESTYP = 01  
        NO_CLASSTYPE_FOR_THIS_OBJECT  = 02.
```

```
IF SY-SUBRC <> 0.
  MESSAGE I355 WITH F_SELECT_MESTYP-MESTYP.
  PERFORM IDOC_INPUT_ERROR_RETVAR_FILL TABLES T_IDOC_STATUS
          T_RETURN_VARIABLES
          USING F_IDOC_CONTROL
          V_WORKFLOW_RESULT.

EXIT.
ENDIF.

CALL FUNCTION 'CLAL_KLAH_KSSK_SEL'
  EXPORTING
    KEY_DATE      = SY-DATUM
    KLART         = KLART
  TABLES
    IN_CLASS      = T_SELECT_OPTIONS_CLASS
    EX_KSSK       = T_KSSK
  EXCEPTIONS
    OBJECTS_NOT_FOUND = 01.

IF SY-SUBRC <> 0.
  MESSAGE I355 WITH F_SELECT_MESTYP-MESTYP.
  PERFORM IDOC_INPUT_ERROR_RETVAR_FILL TABLES T_IDOC_STATUS
          T_RETURN_VARIABLES
          USING F_IDOC_CONTROL
          V_WORKFLOW_RESULT.
```



```
EXIT.

ENDIF.

REFRESH T_MATNR.

CLEAR T_MATNR.

LOOP AT T_KSSK.
  T_MATNR-MATNR = T_KSSK-OBJEK.
  APPEND T_MATNR.
ENDLOOP.

SELECT * FROM MARA INTO TABLE T_MARA_SELLIST
      FOR ALL ENTRIES IN T_MATNR
      WHERE MATNR = T_MATNR-MATNR.

ENDIF.

IF T_SELECT_OPTIONS_MATNR <> SPACE
  AND T_SELECT_OPTIONS_CLASS <> SPACE.

LOOP AT T_MARA_MATSEL WHERE LVORM NE 'D'.
  READ TABLE T_MARA_SELLIST WITH KEY MANDT = T_MARA_MATSEL-MANDT
      MATNR = T_MARA_MATSEL-MATNR.

  IF SY-SUBRC = 0.
    MOVE-CORRESPONDING T_MARA_MATSEL TO T_MATKEY.
    APPEND T_MATKEY.
  ENDIF.
ENDLOOP.
```

```
ELSEIF T_SELECT_OPTIONS_MATNR <> SPACE.
```

```
  LOOP AT T_MARA_MATSEL WHERE LVORM NE 'D'.
```

```
    MOVE-CORRESPONDING T_MARA_MATSEL TO T_MATKEY.
```

```
    APPEND T_MATKEY.
```

```
  ENDLOOP.
```

```
ELSEIF T_SELECT_OPTIONS_CLASS <> SPACE.
```

```
  LOOP AT T_MARA_SELLIST WHERE LVORM NE 'D'.
```

```
    MOVE-CORRESPONDING T_MARA_SELLIST TO T_MATKEY.
```

```
    APPEND T_MATKEY.
```

```
  ENDLOOP.
```

```
ENDIF.
```

```
DESCRIBE TABLE T_MATKEY LINES SY-TABIX.
```

```
IF SY-TABIX = 0.
```

```
  MESSAGE I355 WITH F_SELECT_MESTYP-MESTYP.
```

```
  PERFORM IDOC_INPUT_ERROR_RETVAR_FILL TABLES T_IDOC_STATUS
```

```
    T_RETURN_VARIABLES
```

```
    USING F_IDOC_CONTROL
```

```
    V_WORKFLOW_RESULT.
```

```
EXIT.
```

```
ENDIF.
```

```
CALL FUNCTION 'MASTERIDOC_CREATE_REQ_MATMAS'
```

```
EXPORTING
```

```
RCVPFC      = ' '
```

```
RCVPRN      = F_IDOC_CONTROL-SNDPRN
```

```
RCVPRT      = F_IDOC_CONTROL-SNDPRT
```

```
SNDPFC      = ' '
```

```
SNDPRN      = '      '
```

```
SNDPRT      = ' '
```

```
MESSAGE_TYPE = F_SELECT_MESTYP-MESTYP
```

```
IMPORTING
```

```
CREATED_COMM_IDOCS = CREATED_COMM_IDOCS
```

```
CREATED_MASTER_IDOCS = CREATED_MASTER_IDOCS
```

```
TABLES
```

```
MARAKEY      = T_MATKEY.
```

```
V_WORKFLOW_RESULT = 0.
```

```
CLEAR T_IDOC_STATUS.
```

```
T_IDOC_STATUS-DOCNUM = F_IDOC_CONTROL-DOCNUM.
```

```
T_IDOC_STATUS-STATUS = C_IDOC_STAT_IS_POSTED.
```

```
APPEND T_IDOC_STATUS.
```

```
T_RETURN_VARIABLES-DOC_NUMBER = F_IDOC_CONTROL-DOCNUM
```

```
T_RETURN_VARIABLES-WF_PARAM = C_RETV_PROCESSED_IDOCS.
```

```
APPEND T_RETURN_VARIABLES.
```

```
T_RETURN_VARIABLES-WF_PARAM = C_RETV_CREATED_OBJECTS.
```

```
T_RETURN_VARIABLES-DOC_NUMBER = F_SELECT_MESTYP-MESTYP.
```

```
APPEND T_RETURN_VARIABLES.
```

Transmission of Material Master Idoc from R/3 to PCS.

ALE/EDI Configuration

The configuration will have to be created for every PCS Plant.

Assumption: The GLN Number is used to configure the different partners in the system.

Create partners

Source System & Client or Logical System name	GTE + Plant Number
Target System & Client or Logical System Name	SAP System
Message Type	MATMAS
Basic IDoc Type	MATMAS03
Idoc Extension	ZMATMAS03
Process Code / Function Module	N/A

IDoc Modifications

SAP Idoc Type:	MATMAS03
SAP Idoc Extension	ZMATMAS03
Segment Name	/XYZ/DISTR000
Mandatory	N
Min Number	1
Max Number:	999
Parent Segment	E1MARAM

Material Master Download To PCS



Segment Field	Internal Length	External Length	Off set	Data Type	Data Element
GLN_NUMBER	13	13	0	CHAR	/XYZ/GLN_NUMBE R

SAP Idoc Type:	MATMAS03				
SAP Idoc Extension	ZMATMAS03				
Segment Name	/XYZ/E1MARAM000				
Mandatory	N				
Min Number	1				
Max Number:	1				
Parent Segment	E1MARAM				
Segment Field	Internal Length	External Length	Off set	Data Type	Data Element
GTIN_VARIANT	2	2	0	CHAR	/XYZ/GTIN_VARIANT

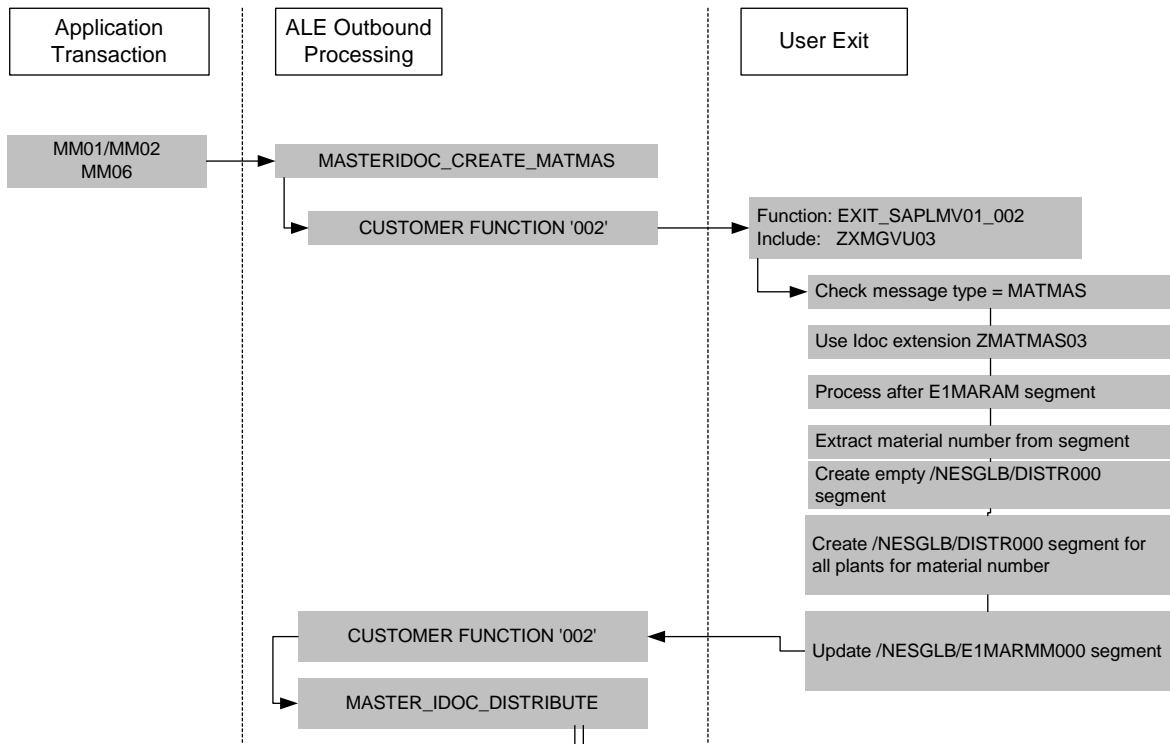
SAP Idoc Type:	MATMAS03				
SAP Idoc Extension	ZMATMAS03				
Segment Name	/XYZ/E1MARMM000				
Mandatory	N				
Min Number	1				
Max Number:	1				
Parent Segment	E1MARMM				

Segment Field	Internal Length	External Length	Off set	Da ta Ty pe	Data Element
GTIN_VARIANT	2	2	0	C H A R	/EURGLB/GTIN_VARI ANT

User Exit / Enhancement Detailed Description

The SAP program creates an Idoc segment by segment. After creating a segment, it accesses the exit module and allows you to append your additional fields/segments.

In this user exit, the fields that have not been updated by the standard program should be updated.



Check message type = MATMAS

1. Update segment /XYZ/DISTR000 (Add message recipients to recipients-segment)

Select all plants the material is applicable to. Do this when passing through the E1MARAM-segment.

SELECT SINGLE		
FIELDS		
WERKS	Plant	
TABLE		
MARC	Plant Data for Material	

SELECT SINGLE				
FIELDS				
CONDITIONS				
	MATNR	Material	EQ	E1EMARA-MATNR

For every plant, check if it is managed on a 3rd party warehouse (Added with change 4.0)

Get the plants linked to a warehouse from table 320

SELECT				
FIELDS				
WERKS	Plant			
TABLE				
T320	Assignment IM Storage Location to WM Warehouse Number			
CONDITIONS				
	WERKS	Plant	EQ	MARC-WERKS

Only consider plants that do NOT have an entry in table T320 for getting the GLN Numbers in the next step. (Added with change 4.0)

For every plant, get the plant GLN Number from the plant number

SELECT SINGLE				
FIELDS				

SELECT SINGLE				
FIELDS				
KUNNR	Customer number of plant			
TABLE				
T001W	Plants/Branches			
CONDITIONS				
	WERKS	Plant	EQ	MARC-WERKS
SELECT SINGLE				
FIELDS				
BBNR	International location number (part 1)			
BBSNR	International location number (part 2)			
BUBKZ	Check digit for the international location number			
TABLE				
KNA1	General Data in Customer Master			
CONDITIONS				
	KUNNR	Customer number	EQ	T001W-KUNNR

Concatenate BBNR, BBSNR and BUBKZ to obtain the receiver partner number.

Add an occurrence of the segment /XYZ/DISTR000 with the concatenated field.

Update segment /XYZ/E1MARAM000 (Add GTIN-Variant)

From the material number, get the GTIN-Variant for the E1MARAM-segment

SELECT SINGLE				
FIELDS				
GTIN_VARIANT	GTIN Variant			
TABLE				
MARM	Units of Measure for Material			
CONDITIONS				
	MATNR	Material	EQ	E1MARAM-MATNR

Move GTIN_VARIANT to GTIN_VARIANT-field in Idoc segment

3. Update segments /XYZ/E1MARMM000 (Add GTIN-Variant)

From the material number and the UoM, get the GTIN-Variant for the E1MARMM-segments

SELECT SINGLE				
FIELDS				
GTIN_VARIANT	GTIN Variant			
TABLE				

SELECT SINGLE				
FIELDS				
MARM	Units of Measure for Material			
CONDITIONS				
	MATNR	Material	EQ	E1MARMM-MATNR
AND	MEINH	Alternative unit of measure for stockkeeping unit	EQ	E1MARMM-MEINH

Move GTIN_VARIANT to GTIN_VARIANT-field in Idoc segment

Author Bio

Aveek Ghose is a consultant with IBM, India

M.S. Information Systems 1993, George Mason University, Fairfax, VA, USA.

M.S. in Economics, 1991, Virginia Tech, Blacksburg, VA, USA.

