

# Contents

<b>ELECTRONIC PURCHASE INVOICE MATCHING</b> .....	<b>3</b>
<i>Introduction</i> .....	3
<i>Feature Benefits</i> .....	3
<b>EXECUTIVE OVERVIEW</b> .....	<b>4</b>
<i>EPIM from EDP</i> .....	4
<b>EPIM - THE PROCESS</b> .....	<b>6</b>
<b>POP.16</b> .....	<b>10</b>
<i>Operational Overview</i> .....	10
POP.16.1 .....	11
<i>EDI INVOICE RECONCILIATION</i> .....	11
POP.16.2 .....	14
<i>PURCHASE INVOICE REPORTS</i> .....	14
POP.16.2.1 .....	14
POP.16.2.2.....	14
POP.16.2.3.....	15
POP.16.2.4.....	15
POP.16.2.5.....	15
POP.16.2.6.....	15
POP.16.2.7.....	15
POP.16.3 .....	17
POP.16.3 .....	18
<i>PURCHASE INVOICE MANUAL UPDATE ROUTINE</i> .....	18
POP.16.4 .....	20
<i>EPIM MAINTENANCE (Tolerances)</i> .....	20
POP.16.5 .....	21
<i>PURCHASE INVOICE ENQUIRY</i> .....	21
POP.16.6 .....	21
<i>ERROR HANDLING ROUTINES</i> .....	21
<b>MERCHANT EDI PURCHASE INVOICE PROCESSING – DATABASE DESIGN</b> .....	<b>22</b>
<i>Appendix A - BASDA.HEADERS AND BASDA.LINES</i> .....	22
<i>Appendix B - ADVICE NOTE REGISTER</i> .....	23
<i>Appendix C - PIRFILE</i> .....	25
<i>Appendix D - PIRLINES</i> .....	26
<i>Appendix E - PLP.FORMAT</i> .....	27



# **Electronic Purchase Invoice Matching**

## **Introduction**

Electronic Purchase Invoice Matching (EPIM) is the automatic processing and matching of electronically held Goods Received Notes and the subsequent posting of Supplier Invoices to the Accounts payable ledger within an Enterprise which reduces input errors and highlights omissions and mistakes within Supplier prime documentation or pricing anomalies within purchasing data..

Currently within most organisations accounting infrastructure, the manual matching of paper invoices to goods receipt information is one of the most labour intensive and tedious processes undertaken and is also responsible for a high proportion of the total cost of this infrastructure.

The solution provided by EDP Plc group consists of several components all of which can be utilised in a stand alone capacity or alternatively if implemented in full will provide any organisation with a seamless integration strategy for them and their Suppliers.

## **Feature Benefits**

- Reduction in Operational Costs.
- Elimination of paper chasing.
- More frequent achievement of early payment discounts.
- Provide the ability to Negotiate for more favourable trading terms.
- Creation of stronger Supply Chain relationships.
- Minimise overpayments and duplicate payments.
- Elimination of paper storage, filing and copying.
- Improved Audit trails
- More data accuracy in processing from prime documents.
- Better budgetary control.
- Greater accuracy of matching process.
- Enable better qualification of Supplier Performance.

# **Executive Overview**

## **EPIM from EDP**

The components that make up the EPIM solution provided by EDP plc are, in chronological order of business process.

### **Enterprise Business Application**

Creation of XML Supplier order to the BASDA (Business and Accounting Software Development Association) schema.

### **Quantum VS XML Highway**

Delivery or/and transformation of BASDA XML Supplier order to the standard and delivery requirement of Trading Partner. Ie CSV e-mail attachment.

### **Quantum VS XML Highway**

Receipt of Supplier Invoice in electronic form and/or transformation to XML Supplier Invoice to BASDA schema. Delivery to Enterprise Business Application.

### **Enterprise Business Application - EPIM**

The Invoice is received and converted to a header and lines file relevant to the Business Application receiving the invoice. This is followed by the Posting of Accounts payable invoice with or without matching with electronic Goods Received Note. The Matching concept is between the Goods received value and the Purchase Invoice value.

There is no validation between the original purchase order and the Goods received document within the EPIM process. The matching is performed initially at the product level and is done as a two stage process, the quantities then the individual line value.

There are tolerance checks that can be applied at Supplier and/or product and/or product group level which can define the level of mismatch that will be allowed during the matching process. These tolerance checks can be by value

or percentage. There is a range of error conditions that will highlight to the user why the matching process has failed.

The restriction that normally applies to this automated process is also alleviated by some flexibility being introduced as to the way a Supplier submits its invoices in relation to its deliveries or the purchase orders that create the demand.

A Purchase Invoice may cover more than one delivery advice note per purchase order. A number of delivery advice notes may relate to an original Purchase order which in turn may relate to a number of invoices or just one invoice. A purchase invoice may cover one delivery advice note.

A Purchase Invoice may be received electronically before the Goods received note is created. The Purchase invoice will remain unallocated until the corresponding Goods received notes are available for matching.

Records that fail this matching process are reported and need to be posted manually.

The matching is based upon the delivery advice note reference, which is taken from the Goods received record. This data must be held within this record for the EPIM to function.

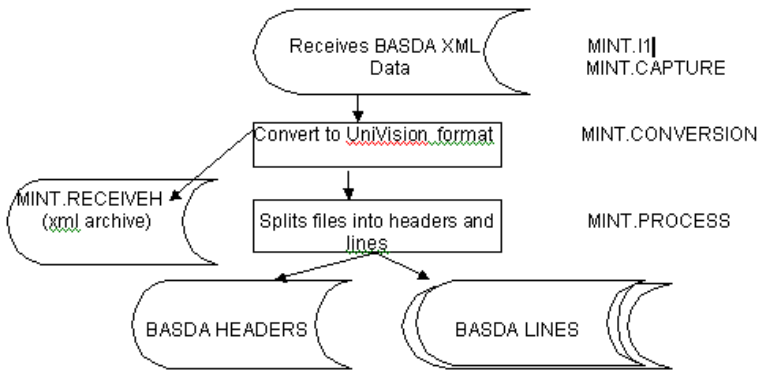
There is a complete set of reports and analysis to assist in the examination of both matched and unmatched documents

## EPIM - The Process

The following flow diagrams show the path of the data through the matching process and these all take place within the Business Application.

### Electronic Purchase Invoice Matching (EPIM) Structure

Stage 1 – From BASDA XML to Univision Headers and Lines files



The MINT.I1 program consists of a number of different functions.

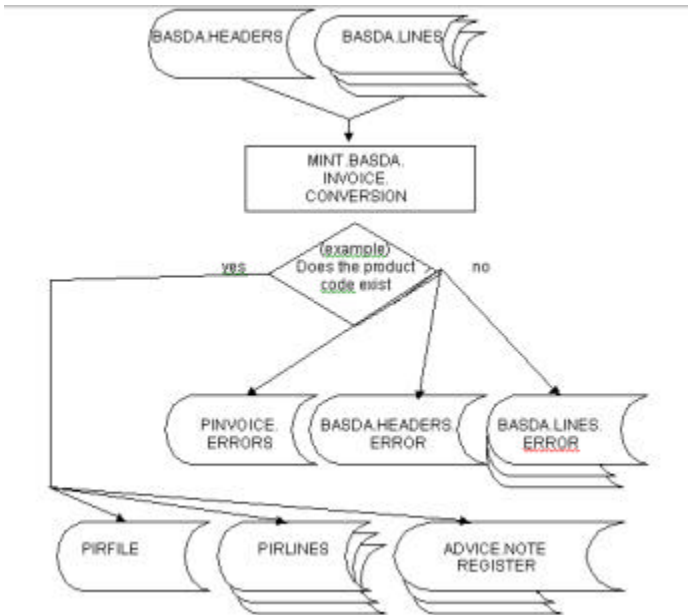
MINT.CAPTURE. collects all data received from the Quantum VS XML Highway. MINT.CONVERSION then converts and parses this data into a Univision format . Any characters including control characters not recognised are discarded. This process also performs some rudimentary checks and validations such as ensuring that the producer id tag within the document is a known entity This process also attempts to discover the type of document that has been sent in order to dictate the next process path to follow. For EPIM documents the message type will be an INVOICE. This process also takes a copy of the original XML file in MINT.RECEIVEH.

MINT.CONVERSION then initiates MINT.PROCESS which splits the Univision file into headers and lines and populates data within two files, a

BASDA.HEADERS file and a BASDA.LINES file. Much of the unnecessary data within the BASDA standard invoice schema is discarded and these two simple files are held within the MERCHANT application file structure. An example of a BASDA.HEADER record and the four corresponding BASDA.LINES records is shown in APPENDIX A including the BASDA schema tag labels.

## Electronic Purchase Invoice Matching (EPIM) Structure

Stage 2 – From BASDA Headers and BASDA Lines to PIRFILES and PIRLINES



The BASDA.HEADER AND LINES records are now processed by the MINT.BASDA.INVOICE.CONVERSION routine which creates the PIRFILE(appendix C), PIRLINES(appendix D) and ADVICE NOTE REGISTER(ANR)(appendix B) records. If the ANR record exists (due to a Goods receipt note (GRN) being previously received) then this process will update this ANR record. The circumstance may exist in that the GRN is received before or after the receipt of the invoice and the EPIM software is flexible to allow this.

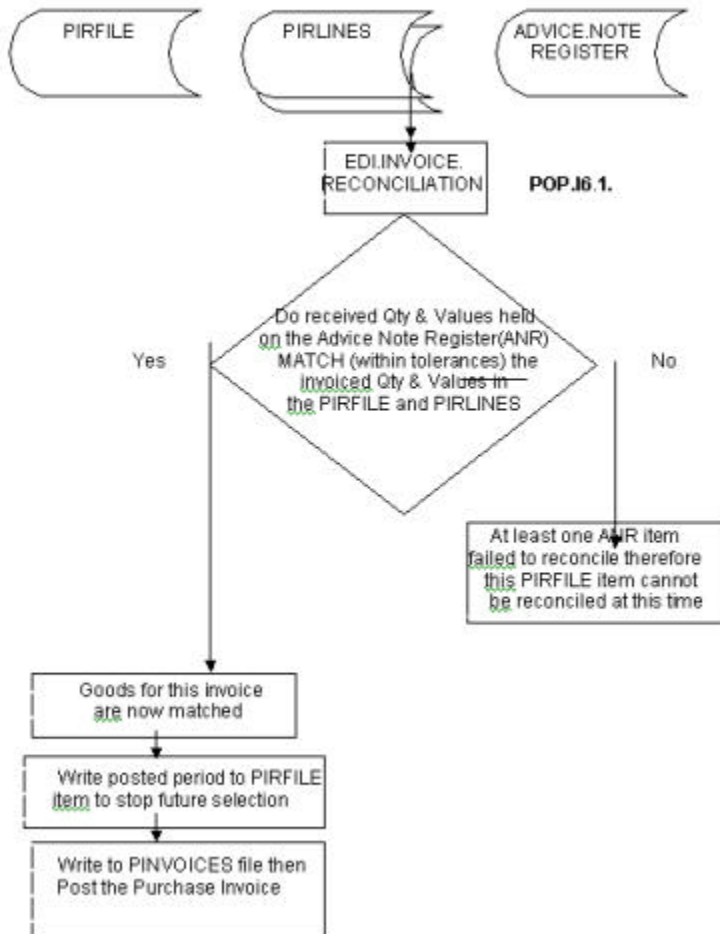
The ability to check against any transient errors such as the product code not being recognised is performed within this process and if this is the situation the errors files are populated

PINVOICE.ERRORS contains the nature of the error. BASDA.HEADERS.ERROR and BASDA.LINES.ERROR contains a copy of the data in order for the user to represent if relevant.



## Electronic Purchase Invoice Matching (EPIM) Structure

### Stage 3 – Invoice Reconciliation (POP.I6)



# POP.16

## Operational Overview

The Merchant keyboard sequence 'POP', 'POP6' and 'POP.16' takes the user to the Purchase Invoice EDI Routines menu that offers the options shown below:

<b>EDI INVOICE RECONCILIATION .....</b>	<b>POP.16.1</b>
<b>PURCHASE INVOICE REPORTS .....</b>	<b>POP.16.2</b>
<b>PURCHASE INVOICE MANUAL UPDATE ROUTINE .....</b>	<b>POP.16.3</b>
<b>EPIM MAINTENANCE (Tolerances).....</b>	<b>POP.16.4</b>
<b>PURCHASE INVOICE ENQUIRY .....</b>	<b>POP.16.5</b>
<b>ERROR HANDLING ROUTINES .....</b>	<b>POP.16.6</b>

# POP.16.1

## EDI INVOICE RECONCILIATION

Two basic programs are called from PROCS POP.16.1 EDI.INVOICE.RECONCILIATION and EDI.PURCHASE.INVOICE.PROCESS.

### EDI.INVOICE.RECONCILIATION

This routine selects all ANR (ADVICE.NOTE.REGISTER) items that do not have a completed date (ANR attribute 32 = already processed by this routine) which would indicate that this ANR item has already been processed.

After selection, a comparison is made between invoiced and received quantities at line level. If differences are not zero then:

- If the invoiced quantity is less than the received quantity then there's an over-receipt and the status code 'OR' is placed on the parent PIRFILE item with no further tolerance checking required . In this situation then it will be necessary to manually reconcile the item in POPI6.3 or modify the status code to 'C' which permits automatic re-reconciliation in POPI6.1.without further checks.
- If the invoiced quantity is greater than the received quantity then the ANR item is left until a subsequent receipt is made. This item will remain until either the necessary goods receipt is made or the invoice exceeds the due date, attribute 7 in the PIRFILE, at which time this item is flagged as status code 'O'. In this situation it will be necessary to manually reconcile the item in POPI6.3 or modify the status code to 'C' which permits automatic re-reconciliation in POPI6.1.without further checks

During this comparison and if the difference between invoiced quantities and received quantities is zero or the invoiced quantity is greater than the received quantity the tolerances are verified (percentage and/or value – derived from the EPIM.TOLERANCES file).

The tolerances are defined as styles depending upon the settings within POPI6.4.

**Style 1:** determines the value test is based only within a monetary value.

*Example:*

Invoice value £100

Receipt value £90

Variance £10

Tolerance set £10

Result =pass

**Style 2:** determines the test on any discrepancy between Goods received value and Purchased Invoice value is examined in percentage terms only. Typical percentages of allowable discrepancy will be say around a quarter of one percent – 0.25%. Note that the standard is to test the value of the whole invoice against all Goods received but if the Prod Group or Product based Tolerance definitions can be found then the test just uses that portion of the Invoice content.

Invoice value £100

Receipt value £90

Tolerance set 9%

Variance 10%

Result =failure

The **Style 3** and **Style 4** settings determine that the comparison is done on both value and /or a percentage. The system has a match on quantities and is now performing a match on value. The expectation is that values too should match.

**Style 3:** settings dictate both a value and percentage test is applied, and if either test is failed then the Purchase Invoice match is marked F failed. Using the above examples the result would be a failure.

**Style 4:** settings again both value and percent discrepancy tests are made but they must both fail in order to class the Invoice as a whole as F - failed. In the above example the result would be a pass.

If no tolerances are set then style 3 will be applied with a zero tolerance for both percentage and value.

If successful and all the related ANR items within a PIRFILE are marked as matched (ANR4 = "Y") then the PIRFILE attribute 18 is set as status 'G'. If unsuccessful, the PIRFILE item has a 'F'ailed status code written to attribute 18 and this item will remain as such until the status code is overridden to either a 'C' for automatic re-reconciliation or an 'M' to be manually processed.

### **EDI.PURCHASE.INVOICE.PROCESS**

A selection of PIRFILE (Purchase Invoices) is made where:

1. Item was EDI/MINT generated – Attribute 36 = 'EDI'
2. and Item has been Goods-Matched (all receipts (GRN's) match invoice costs and quantities and are within tolerances – Attribute 18 = 'G' or a'C'
3. and Attribute 20 is null (item has not yet been posted)

This list is then processed and the resulting PINVOICE items are created and posted to the ledger. This is the end-stage for PIRFILE items.

## POP.I6.2

### PURCHASE INVOICE REPORTS

Available reports

#### PURCHASE INVOICE EDI REPORTS

ALL INVOICES AWAITING RECONCILIATION .....	POP.I6.2.1
ALL OVERDUE INVOICES .....	POP.I6.2.2
ALL FAILED-RECONCILIATION INVOICES .....	POP.I6.2.3
ALL RECONCILED INVOICES (AUDIT) .....	POP.I6.2.4
REPRINT OR ARCHIVE AUDIT .....	POP.I6.2.5
PURGE AUDIT ARCHIVE .....	POP.I6.2.6
PRINT GRN's WITH NO ADVICE .....	POP.I6.2.7

#### POP.I6.2.1

##### All Invoices awaiting reconciliation

This listing shows detail for PIRFILE items that are ready for reconciliation. These are items with an empty attribute 18 (Status Code).

#### POP.I6.2.2

##### All overdue invoices

This listing shows detail for PIRFILE items that have exceeded the due date held on the record and computed during MINT.BASDA.INVOICE.CONVERSION. These will be items with an attribute 18 containing an 'oh'.

### **POP.16.2.3**

#### **All failed reconciliation invoices**

This listing shows any PIRFILE items that have not passed through reconciliation. These will be items that have been processed through the POP.16.1 routine and failed. The attribute 18 item will be flagged as an 'F'

### **POP.16.2.4**

#### **All reconciled invoices (audit)**

This listing shows any PIRFILE items that have been reconciled either automatically (POPI6.1), manually, or by certification (POPI6.3) . This also flags the records as being audited.

### **POP.16.2.5**

#### **Reprint or archive audit**

This process allows a previously audited POPI6.2.4 report to be reprinted or archived.

### **POP.16.2.6**

#### **Purge audit archive**

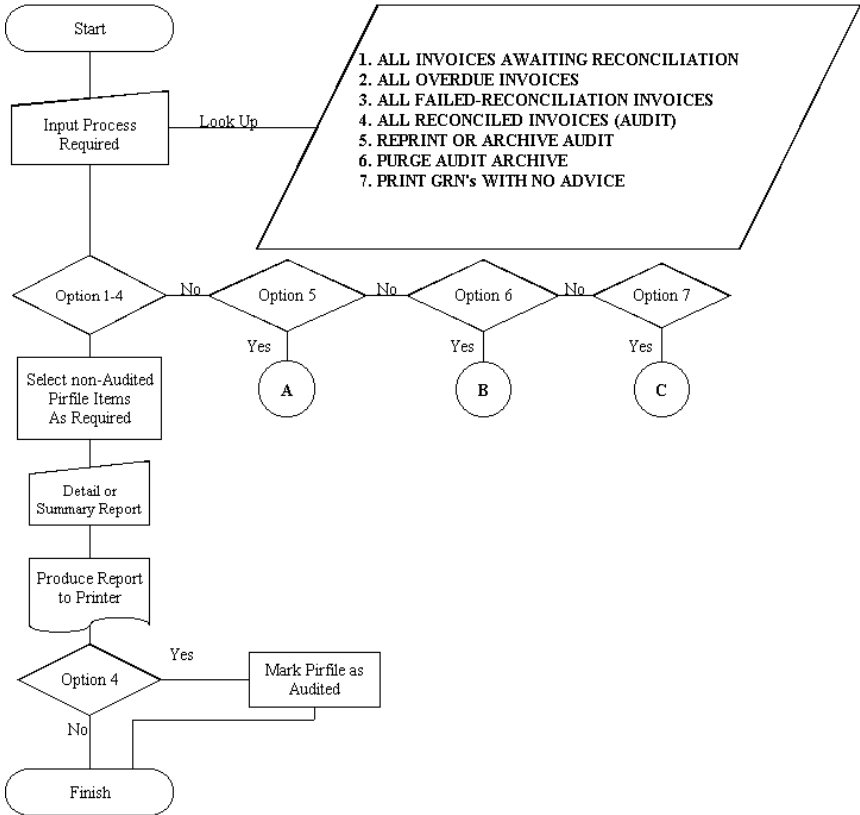
This process allows the audit archive to be purged by date selection to the history files, `ADVICE.NOTE.HISTORY`, `PIRLINES HISTORY` and `PIRFILE.HISTORY`. There is no report output from this process.

### **POP.16.2.7**

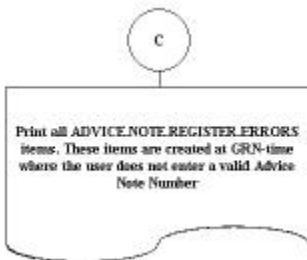
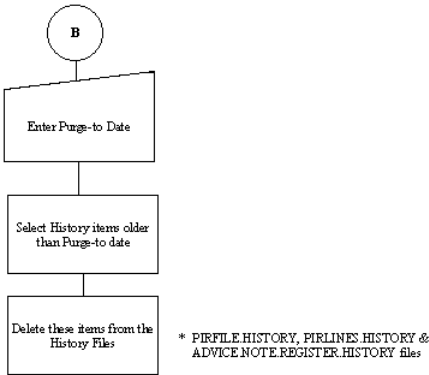
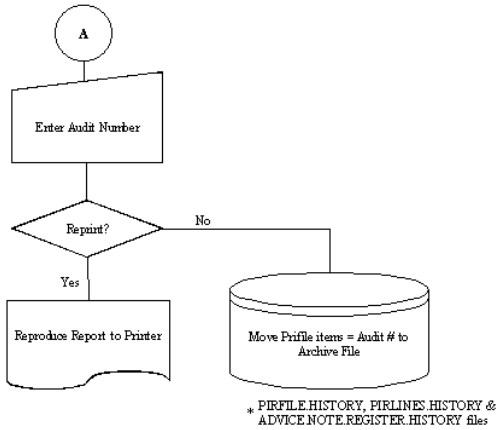
#### **Print GRN with no advice note**

This will report any GRN record with no advice note number.

### PURCHASE INVOICE REPORTS







## POP.16.3

### PURCHASE INVOICE MANUAL UPDATE ROUTINE

This routine allows a user to override any current attribute 18 in the PIRFILE status-code (except for 'G' goods-matched and 'M' manual-update) on any PIRFILE item. Full enquiry screens are available here that show PIRFILE, PIRLINES and ADVICE.NOTE.REGISTER items/data.

A complete list of the possible error codes is shown below:

**AN – No Advice Note Reference**

Recorded at invoice line creation when no advice note reference exists in the invoice line and none is available at invoice header for use at line level.

**DE – Invoice Date Error**

Recorded when no invoice date is provided, the invoice date is incorrectly formatted (the date should be received in format yyyy-mm-dd) or the date fails to validate after UniVision conversion.

**IN – No Invoice Number**

Recorded when the supplier's invoice number is not provided

**IT – Invalid Invoice Type**

Recorded when the invoice type code is other than INV (commercial invoice) or when the function code is other than FII (firm invoice) or TEI (test invoice).

**MP – Invoice line with missing product code**

Recorded when no product code is provided in any of the alternative types of product assignment (buyer's product code, supplier's product code, traded unit code or consumer unit code).

**IP – Invoice line with unrecognised product code**

Recorded under two circumstances:

1. A translate is not available for a supplier's product code, traded unit code or consumer unit code.
2. The buyer's product code, either supplied directly or after translation is not discovered on file.

**EI – Duplicate Invoice**

Recorded when the supplier advice note already exists on the supplier advice note register with the supplier's invoice number.

**EA – Duplicate Advice**

Recorded when the supplier advice note already exists on the supplier advice note register with a different supplier's invoice number.

**ED – Damaged ADVICE.NOTE.REGISTER Item**

Recorded when the invoice conversion process recovers an existing advice note register item with no goods receipt note references.

**OR – Over Receipt**

Recorded when too many receipts (quantities) are made against what has been invoiced.

**SU - Supplier not on file**

**LI – Line details incomplete**

Recorded when:

1. There is a discrepancy between the number of lines in the received line count and the number of lines in the line list for the invoice.
2. There is a fault in the invoice line list (null line number).
3. The record for a line in the list is not recovered.

**XX – Invoice conversion incomplete**

Processing of the received invoice terminates before conversion of the invoice is complete.

## POP.16.4

### EPIM MAINTENANCE (Tolerances)

Allows creation and update of EPIM.TOLERANCE items.

A tolerance has to be set that enables the value during matching of invoice to receipt to be passed even if not fully matched.

The levels of setting for such tolerance may be at a simple Supplier level or at a detail product supplier level, or in between at a Supplier Product group level.

Both Detail and top level could be managed through their own files, however, Supplier and Product group could not. This file is used therefore to keep all data together for simplified control.

Different styles of tolerance can be applied.

ID	SUPPLIER, or, SUPPLIER*PRODGROUP, or SUPPLIER*PRODUCT	
Attribute 1	Style	1 = value, 2 = percent, 3 = value and percent, 4 = value or percent
Attribute 2	Value held as pence	2000 = £20.00
Attribute 3	Percentage held as whole number	1000 = 10%

For style 1 only Att 2 would have a value, for style 2, Att 3 would have a percentage value. For styles 3 and 4, both Att2 and 3 would have values.

It is mandatory that at least a SUPPLIER level record is created for every supplier that is to process invoices through EPIM.

During operations, this ID will be checked to see if it is EPIM enabled.

## **POP.I6.5**

### **PURCHASE INVOICE ENQUIRY**

Essentially the same program as POP.I6.3 but with the update capability removed for enquiry purposes only.

## **POP.I6.6**

### **ERROR HANDLING ROUTINES**

Allows the re-presentation of failed INVOICE or GRN lines.

There are two routines

#### **POP.I6.6.1**

This represents failed data from the BASDA.HEADERS.ERRORS and BASDA.LINES.ERRORS files.

#### **POP.I6.6.2**

This allows the user to resubmit failed GRN items. This should only be used following consultancy with Merchant Support.

# Merchant EDI Purchase Invoice Processing - Database Design

## Appendix A - BASDA.HEADERS AND BASDA.LINES

XML Label	Atrr	BASDA.HEADER MPI160	XML Label	Atrr	BASDA.LINES MPI160*1	BASDA.LINES MPI160*2	BASDA.LINES MPI160*3	BASDA.LINES MPI160*4
*Trading Partner Id*	1	BOW001	BuyersProductCode	1	FREDERF			
Invoice Type	2	INV	SuppliersProductCode	2	HALTI	DOG001	TIDYRIDE	HALTI
Function	3	TEI	TradedUnitCode	3	TUC#1	TUC#2	TUC#3	TUC#4
SuppliersInvoiceNumber	4	PJIC0987654321	ConsumerUnitCode	4	CUC#1	CUC#2	CUC#3	CUC#4
LineValueTotal	5	771000	TaxValue	5				
TaxTotal	6	134925	LineTotal	6	525	1050	131250	2100
InvoiceDate	7	11/03/03	Amount	7	3525	7050	881250	14100
DeliveryNoteNumber	8	AN1	BuyersOrderNumber	8	100	200	300	400
FreightCharges	9	1.23	OrderLineNumber	9	BON1	BON2	BON3	BON4
MiscCharges	10		DeliveryNoteNumber	10	1	2	3	4
*Number of lines*	11	4		11	AN1	AN1	AN2	AN1
*BASDA.LINES suffixes*	12	1/2/3/4						
GrossPaymentTotal	13	905925						
NetPaymentTotal	14	905925						
BuyersOrderNumber	15	BON1						
*Trading Partner Id*	16	BOW001						
	17							
*XML originator*	18	PJICZZ						
	19							
	20							
	21							
	22							
	23							
Test Flag	24	1						

\* = Denotes computed.

## Appendix B - ADVICE NOTE REGISTER

An Advice Note Register (ANR) is required to store the status of each Suppliers Advice Reference (ADV) as it is received into MERCHANT and throughout the life of the documents. This (ANR) is pivotal to the correct operation of Electronic Purchase Invoice Matching (EPIM).

The (ANR) file will contain such data as is required to make decisions from. Associated data can be read from associated files by program or dictionary as required.

The ID of both PIRFILE and GRN.LINKS items are contained within the data as a source for addressing. The Supplier and ADV are held in both GRN.LINKS and PIRFILE for reverse addressing.

ID	SUPPLIER*(ADV) The Suppliers system reference SUO Advice Reference as supplied with all spaces and control characters removed.
Att 1	Suppliers Invoice Number (SIN) This also signifies that an Invoice has been received
Att 2	Ledger Due Date Date item has to be posted to ledger for payment
Att 3	PIRFILE ID Identity in file for Purchase Invoice Registration
Att 4	Invoice Matched Marker Will be Y if matched, O if overdue report .
Att 5	Invoice Posted Marker
Att 6	Total Qty count of all lines
Att 7	Total Goods Value of all lines
Att 8	POORDER ID (not mandatory)
Att 9	For future use
Att 10	MV list of GRN numbers Also signifies that receipts have been received.
Att 11	MV list of GRN dates
Att 12	Total Qty Count of all GRN's
Att 13	Total Goods Value for all lines received
Att 14 to 19	for future use
Att 20	MV List of all products relating to Invoice or GRN
Att 21	MV List of qty invoiced
Att 22	MV List of qty received

- Att 23 MV List of differences  
The sum of this attribute will be used to check if all qty received or if over receipt for invoice.
- Att 24 MV List of value invoices per product
- Att 25 MV List of value received per product
- Att 26 MV List of value difference per product  
This list will be used for primary tolerance checking.
- Att 27 MV List of Acceptance Markers from tolerance check.
- Att 28 Value out of variation beyond tolerance
- Att 29 Percentage of variation beyond tolerance
- Att 30 Value of tolerance allowed
- Att 31 Percentage of tolerance allowed
- Att 32 Completed



## Appendix C - PIRFILE

The current PIRFILE has most attributes required for the Purchase Invoice Header information. An Index will be required that enables Supplier, Invoice No checking.

This INDEX would be on PI2\*PI3 enabling return of the ID.

ID	REGCODE	(PIRFILE ID
PI1	TYPE CODE	(I –Invoice, C - Credit
PI2	SUPPLIER CODE	(Supplier ID
PI3	INVOICE NO	(SIN
PI4	GOODS AMOUNT	
PI5	VAT AMOUNT	
PI6	INVOICE DATE	
PI7	DUE DATE	(calculated from PI6)
PI8	REFERENCE	(Advice Note Reference (ANR)
PI9	SUPPLIER REPORT NAME	
PI10	NOMINAL CODE	
PI11	CIRC REF	
PI12	DATE SENT	
PI13	AUTHORISED BY	
PI14	AUTHORISED DATE	
PI15	DELETE IND	
PI16	No of PIRLINES	
PI17	PIRLINE Nos	
PI18	STATUS	(see POPI6.3 detail for full list)
PI19	DATE POSTED	
PI20	POSTED	
PI21	DATE CREATED	(new attribute
PI22	AUDIT NUMBER	(new attribute
PI23	ERROR AUDIT NUMBER	
PI24	MISC. CHARGES	
PI25	GROSS PAYMENT TOTAL	
PI26	TOTAL AFTER CSD	
PI27	BUYERS ORDER NO	
PI28	ADVICE NOTE LIST	
PI29	ADVICE INVOICE LINE NOS	
PI30	XML SOURCE ENVELOPE ID	
PI31	OVERDUE DATE	(Date by which invoice should be reconciled)
PI32	VAT ANALYSIS CODES	
PI33	VAT ANALYSIS % RATES	
PI34	VAT ANALYSIS VALUES AT RATE	
PI35	VAT ANALYSIS TAX AT RATE	

## **Appendix D - PIRLINES**

A new file is required to contain the detail information from the Suppliers Invoice.

ID	PIRFILE ID * Line Number	
PL1	PRODUCT CODE	(Converted to Merchant if required
PL2	LINE VALUE	(Total goods Value for line
PL3	LINE QTY	(Total Qty on line
PL4	BUYERS ORDER NO	
PL5	BUYERS ORDER LINE NO.	
PL6	PACK SIZE	
PL7	ADVICE NOTE NO	

## **Appendix E - PLP.FORMAT**

ID	EPIM.CONTROL
Att 1	Last Audit Number
Att 2	For future use
Att 3	For future use
Att 4	For future use