

Card Generation Interface Specification

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Global Processing Services Ltd.
6th Floor, Victoria House, Bloomsbury Square, London, WC1B 4DA
Support Email: ops24@globalprocessing.com
Support Phone: +442037409682
Documentation queries: docs@globalprocessing.com

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1. About this Document

This document describes the format for the GPS Card Generation XML Interface.

The interface allows card manufacturers to accept card generation files from GPS.

What's Changed?

If you want to find out what's changed since the previous release, see the [Document History](#) section.

1.1. File Naming Conventions

The file naming convention is flexible but by default, card interface files have the following naming convention:

XXXX_PPPP_rrrr_bbbb.xml

Where:

- XXXX - is the Institution name as held by Global Processing Services
- PPPP - is the first PRODUCT_REF (product reference) in the file
- Rrrr - is the number of records in the file
- Bbbb - is the unique GPS batch number

Example

CLI_PRODUCT1_124_1571.xml

1.2. Related Documents

Refer to the table below for other documents which should be used in conjunction with this guide.

Document	Description
Web Services Guide	Describes how to use the GPS web services API to make agency banking requests.
EHI Guide	Provides details of the GPS External Host Interface (EHI).
Smart Client Guide	Describes Smart Client, which is an administration application that can be used to view and manage cards and transactions in your program.

2. XML Fields

This section provides details of the fields included in the XML file.

XMLTAG	Type	Length	Description	Nulls Allowed
<CARDGEN>			Header tag	N/A
<CARDSUM>			Summary file opening tag	N/A
<DATA_FORMAT_VERSION>	Varchar	5	File version	No
<FILEDATE>	dd-mm-yyyy	10	File date	No
<FILETIME>	hh-mm-ss	10	File time	No
<NO_OF_CARRIERS>	Integer		Number of carriers	No
<NO_OF_CARDS>	Integer		Number of cards	No
<NO_OF_PRODUCTS>	Integer		Number of different products in the file (Mag stripe/chip etc)	No
<TXREF>	varchar	30	Transmission_Reference This is an incrementing reference number and may not be consecutive.	No
<ORDER_REF>	varchar	30	Customer order reference number	Yes
<PRODUCT>			Defines a product set	N/A
<PRODUCT_REF>	varchar	50	Identifies the product. Note: This is the physical card Design reference as used by the card printer.	No
<RECORD>			Defines a record within a Product	N/A
<REQUEST_TYPE>	varchar	15	Indicates whether the card is a "New" or "Replacement" card request For PIN Mailers, can be one of: PIN_MAILER NEW_WITH_PINM REPL_WITH_PINM	No
<UID>	Varchar	20	Unique identifier to identify the record. You can use this in error tracking.	No
<CARRIER>			Defines the Carrier section	N/A
<TITLE>	Varchar	10	Cardholder title	Yes
<FNAME>	Varchar	20	Cardholder first name	Yes
<SNAME>	Varchar	30	Cardholder surname	Yes
<ADD1>	Varchar	50	Cardholder address line 1	Yes
<ADD2>	Varchar	50	Cardholder address line 2	Yes
<ADD3>	Varchar	50	Cardholder address line 3	Yes
<ADD4>	Varchar	50	Cardholder address line 4	Yes
<CITY>	Varchar	50	Cardholder address city	Yes
<POSTCODE>	Varchar	10	Cardholder address postcode	Yes
<MOBILE>	Varchar	50	Mobile phone number linked to the card	Yes
<COUNTRY>	Varchar	3	Cardholder address country. Numeric 3-digit ISO 3166-1 Country code (e.g. 052 for	Yes

XMLTAG	Type	Length	Description	Nulls Allowed
			Barbados). (Always 3 digits, use leading zeros if needed.)	
<BULK_ADD1>	Varchar	50	Alternative delivery address line 1. If present, should be used in preference to carrier address.	Yes
<BULK_ADD2>	Varchar	50	Alternative delivery address line	Yes
<BULK_ADD3>	Varchar	50	Alternative delivery address line 3	Yes
<BULK_CITY>	Varchar	50	Alternative delivery address city	Yes
<BULK_COUNTY>	Varchar	20	Alternative delivery address count	Yes
<BULK_POSTCODE>	Varchar	10	Alternative delivery address postcode	Yes
<BULK_COUNTRY>	Varchar	3	Alternative address country. Numeric 3-digit ISO 3166-1 Country code (e.g. 052 for Barbados). (Always 3 digits, use leading zeros if needed.)	Yes
<CARRIER_TYPE>	Varchar	20	Defines carrier product. Note: This is the Carrier Product Design reference as used by the card printer.	No
<CARRIER_LOGO_ID >	Varchar	20	Defines an optional carrier logo.	Yes
<DELV_METHOD>	Char	1	The delivery method for the card: 0 = Standard mail (default) 1 = Registered mail 2 = Direct delivery (Courier)	No
<DELV_CODE>	Varchar	12	The delivery code for the card: If specified, all cards with the same delivery code are to be sent together to the specified BULK delivery address. Carriers with the same DELV_CODE will be grouped together in the file.	Yes
<FULFIL1>	Varchar	50	RFU (Reserved for Future Use)	Yes
<FULFIL2>	Varchar	50	RFU	Yes
<LANG>	Char	2	Defines the language of the carrier product, if it is not already defined by the <CARRIER_TYPE> elements. Uses ISO 639-1 language code. Examples: English is "en", French is "fr"	Yes
<CARD>			Card definition opening tag.	N/A
<TYPE>	varchar	20	Defines the product: "Mag only" "Chip&Mag" "Chip over Paywave"	No
<CURRENCY>	Char	4	4-digit ISO currency code. For example: "0826"= GBP	No
<TRACK1>	Varchar	76	Track 1 data for magnetic stripe, excluding the Start Sentinel, End Sentinel and LRC characters.	No

XMLTAG	Type	Length	Description	Nulls Allowed
			Note: The ISO standard allows for maximum of 76 (excluding the Start Sentinel, End Sentinel and LRC characters). Track Layout MASTERCARD: B + PAN + ^ + Name + ^ + Expiry date in "yyMM" format + Service Code + 00000 + CVV1 + 0000000 VISA: B + PAN + ^ + Name + ^ + Expiry in "yyMM" format + Service Code + 00 + CVV1 + 000000	
<TRACK2>	Varchar	37	Track 2 data for the magnetic stripe, excluding Start Sentinel, End Sentinel and LRC characters. MASTERCARD: PAN + = + Expiry date in "yyMM" format + Service Code + 000000 + Validity in months + CVV1 + PAN Sequence No VISA: PAN + = + Expiry Date in "yyMM" format + Service Code + CVV1 + 00000	No
<TRACK3>	Varchar	104	Track 3 data for the magnetic stripe, excluding Start Sentinel, End Sentinel and LRC characters. ISO standard allows for a maximum of 104 characters (excluding Start Sentinel, End Sentinel and LRC). By default, GPS will put the Card 9-digit token in this element.	Yes
<EMBOSS_PAN>	Integer	19	Embossed card Primary Account Number (PAN)	No
<EMBOSS_NAME>	varchar	27	Embossed card name. Actual maximum length will depend on the card design.	Yes
<EMBOSS_START>	Varchar	10	Embossed card start date (MM/YY)	No
<EMBOSS_EXPIRY>	Varchar	10	Embossed card expiry date (MM/YY)	No
<EMBOSS_CVC2>	varchar	10	Embossed card Verification Code 2 (CVC2)	No
<EMBOSS_LINE4>	Varchar	27	Embossed card line 4. Actual maximum length will depend on the card design.	Yes
<THERMAL_LINE1>	Varchar	70	Example, Company name	Yes
<THERMAL_LINE2>	Varchar	120	RFU	Yes
<IMAGE_ID>	Varchar	20	Identifies the image file that will be printed on the face of the card.	Yes
<LOGO_FRONT_ID>	Varchar	30	Identifies the logo file that will be printed on the face of the card.	Yes

XMLTAG	Type	Length	Description	Nulls Allowed
<LOGO_BACK_ID>	Varchar	30	Identifies the image file that will be printed on the back of the card, if supported.	Yes
<QRCODE>	Varchar	100	Identifies the QR code that will be printed on the card, if supported. You can add separate values to each card using GPS Web Services.	Yes
<PINBLOCK>	Hexadecimal	16	Optional. Will only be present if the card is Mag stripe and the card requester requires online PIN. Used for PIN mailers. Format is the same as <PINBLOCK> in the <CHIP> section; see below.	Yes
<CHIP>			Defines the chip details. This element may not be present, depending on Card Type.	N/A
<TYPE>	varchar	10	Possible values: • Maestro • Mastercard • VisaCard • Euro Cirrus • EuroCard • Cirrus Maestro • PLUS Card	Yes
<PAN>	Integer	16-19	Primary Account Number ISO 8583 bit 2	Yes
<PAN_SEQ>	Integer	2	PAN Sequence number. ISO 8583 bit 23. Value from 00 to 99.	Yes
<NAME>	Varchar	26	Must match name embedded in Track 1	Yes
<START_DATE>	Integer	6	YYMMDD	Yes
<EXPIRY_DATE>	Integer	6	YYMMDD	Yes
<SERVICE_CODE>	Integer	3	Three decimal digits as defined in ISO 7813. First digit: Use and Technology: 1 = International 2 = International, Chip 5 = National Use Only 6 = National Use Only, Chip 7 = Private Label 9 = Test Card Second digit: Authorisation requirements: 0 = Normal 2 = Online Authorisation Required 4 = Online Authorisation required unless special agreement Third digit: Service and PIN requirements: 0 = PIN Required 1 = No restrictions 2 = Purchases only 3 = ATM Only, PIN required 4 = Cash only 5 = Purchases only, PIN required	Yes

XMLTAG	Type	Length	Description	Nulls Allowed
			6 = Use PIN if possible 7 = Purchases only, use PIN if possible	
<CHIP_TRACK_1>	varchar	76	This is the entire chip track 1 for EMV transactions. It permits the derivation of EMV tag hex 9F1F (track 1 discretionary data as defined in ISO 7813) which is part of this. MASTERCARD: B + PAN + ^ + Name + ^ + Expiry date in "yyMM" format + Service Code + 00000 + iCVV + 0000000 VISA: B + PAN + ^ + Name + ^ + Expiry Date in "yyMM" format + Service Code + 00 + iCVV + 000000	Yes
<CHIP_TRACK_2>	varchar	38	This is the EMV Track 2 equivalent data, for EMV tag hex 57. It is for EMV-based (including qVSDC) transactions (both contact and contactless) MASTERCARD: PAN + D + Expiry in "yyMM" format + Service Code + 000000 + Validity in months + iCVV + PAN Sequence No (If the length of CHIP_TRACK_2 is odd then will add "F" at the end) VISA: PAN + D + Expiry Date in "yyMM" format + Service Code + iCVV + 00000 (If the length of CHIP_TRACK_2 is odd then will add "F" at the end)	Yes
<CHIP_TRACK_1_MSD_CL>	Varchar	76	Optional. This element will only be present if the product type supports Contactless Magnetic Stripe Transactions. It is the base Track 1 for Contactless Magnetic Stripe (which is not EMV) transactions. MASTERCARD: For Mastercard, this is for tag hex 56 (PayPass Magstripe Track 1 Data.) (See Mastercard "PayPass MagStripe Technical Specifications v3.2 Oct 2006".) VISA: For Visa, if there is a separate data item on the ICC for the Track 1 exclusively for Magnetic	Yes

XMLTAG	Type	Length	Description	Nulls Allowed
			Stripe Data (not EMV or qVSDC) then use this for it. Format is same as <CHIP_TRACK_1> except Name is replaced with space and forward slash i.e. " /", and discretionary data may be different.	
<CHIP_TRACK_2_MSD_CL>	Varchar	37	Optional. This element will only be present if the product type supports Contactless Magnetic Stripe transactions. It is the base Track 2 for contactless Magnetic Stripe (which is not EMV) transactions. MASTERCARD: For Mastercard, this is for tag hex 9F6B (PayPass Magstripe Track 2 Data.) (See Mastercard "PayPass MagStripe Technical Specifications v3.2 Oct 2006".) VISA: For Visa, if there is a separate data item on the ICC for the Track 2 exclusively for Magnetic Stripe Data (not EMV or qVSDC) then use this for it. Format is same as <CHIP_TRACK_2> but discretionary data may be different.	Yes
<PINBLOCK>	Hexadecimal	16	Holds the encrypted PIN to be placed on the chip card. Format is ISO 9564-1 Format 0 (same as ANSI X9.8 Format 0), triple DES encrypted with the double-length Zone PIN Key, expressed as 16 hex digits (with 2 hex digits representing 1 binary byte.) This is formed as: Plaintext PIN field = '0' + PIN length (4-C) + PIN + 'F's padding to 16 hex digits. Account number field = '0000' + rightmost 12 digits of the PAN excluding the check digit. Then XOR the 'Plaintext PIN field' and 'Account number field'. This is 16 hex digits representing 8 binary bytes. Then Triple-DES encrypt the resultant 8 binary bytes with the double length Zone PIN Key.	Yes

XMLTAG	Type	Length	Description	Nulls Allowed
			Example: PAN = 5299887766554439 PIN = 223344 Zone PIN Key = 3B6870987613107CFB1F4C6EC17F3483 Plaintext PIN field = 06223344FFFFFFFF Account Number Field = 0000988776655443 Result of XOR = 0622ABC3899AABBC Encrypting this with the Zone PIN key gives result: 7553DAA289620533 So PINBLOCK is 7553DAA289620533	

2.1. XML Markup

Please note that certain characters are reserved for XML markup. When an XML parser encounters a reserved character, it assumes it has encountered an element, entity or markup statement. The following examples of reserved characters, and what you should replace this with if you need to include that character as data in the XML file:

Reserved character	What you should use
<	<
>	>
&	&
'	'
"	"

3. Example File

Below is an example of a typical XML file

```
<?xml version="1.0" encoding="utf-8"?>
<CARDGEN>
  <CARDSUM>
    <DATA_FORMAT_VERSION>10</DATA_FORMAT_VERSION>
    <FILEDATE>26/03/2013</FILEDATE>
    <FILETIME>09-15-55</FILETIME>
    <NO_OF_CARRIERS>2</NO_OF_CARRIERS>
    <NO_OF_CARDS>2</NO_OF_CARDS>
    <NO_OF_PRODUCTS>1</NO_OF_PRODUCTS>
    <TXREF>1001</TXREF>
    <ORDER_REF>ABC-123</ORDER_REF>
  </CARDSUM>
  <PRODUCT>
    <PRODUCT_REF>DESIGN1</PRODUCT_REF>
    <RECORD>
      <REQUEST_TYPE>New</REQUEST_TYPE>
      <UID>52738099</UID>
      <CARRIER>
        <TITLE>Mr.</TITLE>
        <FNAME>Fred</FNAME>
        <SNAME>Jones</SNAME>
        <ADD1>Sample Company</ADD1>
        <ADD2>1 Sample Street </ADD2>
        <ADD3>Sample Borough </ADD3>
        <ADD4>Sample Address Line 4</ADD4>
        <CITY>Sample City</CITY>
        <POSTCODE>E1W2BS</POSTCODE>
        <COUNTRY>UK</COUNTRY>
        <BULK_ADD1></BULK_ADD1>
        <BULK_ADD2></BULK_ADD2>
        <BULK_ADD3></BULK_ADD3>
        <BULK_CITY></BULK_CITY>
        <BULK_COUNTRY></BULK_COUNTRY>
        <BULK_POSTCODE></BULK_POSTCODE>
        <BULK_COUNTRY></BULK_COUNTRY>
        <CARRIER_TYPE>CAR_1</CARRIER_TYPE>
        <CARRIER_LOGO_ID></CARRIER_LOGO_ID>
        <DELV_METHOD>0</DELV_METHOD>
        <DELV_CODE></DELV_CODE>
        <FULFIL1></FULFIL1>
        <FULFIL2></FULFIL2>
        <LANG>en</LANG>
      </CARRIER>
      <CARD>
        <TYPE>Mag</TYPE>
        <CURRENCY>0826</CURRENCY>
        <TRACK1>B1234567812345678^GIFTCARD/CORPORATE^1811122000009830000000
      </TRACK1>
        <TRACK2>1234567812345678=16102210000006064400</TRACK2>
        <TRACK3>953171211</TRACK3>
        <EMBOSS_PAN>1234 5678 1234 5678</EMBOSS_PAN>
        <EMBOSS_NAME>MR A B SAMPLE</EMBOSS_NAME>
        <EMBOSS_START>11/11</EMBOSS_START>
        <EMBOSS_EXPIRY>10/16</EMBOSS_EXPIRY>
        <EMBOSS_CVC2>1234 135</EMBOSS_CVC2>
        <EMBOSS_LINE4>A123 REG</EMBOSS_LINE4>
        <THERMAL_LINE1>Possible Company Name here</THERMAL_LINE1>
        <THERMAL_LINE2></THERMAL_LINE2>
        <IMAGE_ID></IMAGE_ID>
        <LOGO_FRONT_ID></LOGO_FRONT_ID>
      </CARD>
    </RECORD>
  </PRODUCT>
</CARDGEN>
```

```

        <LOGO_BACK_ID></LOGO_BACK_ID>
        <QRCODE>https://www.flex-e-
card.com/balance/2909680989632389</QRCODE>
        <PINBLOCK>3A56DFF541C12197</PINBLOCK>
      </CARD>
    </RECORD>
    <RECORD>
      <REQUEST_TYPE>New</REQUEST_TYPE>
      <UID>52738098</UID>
      <CARRIER>
        <TITLE>Mr.</TITLE>
        <FNAME>AN</FNAME>
        <SNAME>Other</SNAME>
        <ADD1>Tall Pines</ADD1>
        <ADD2>1 Sample Road </ADD2>
        <ADD3>Sample Borough </ADD3>
        <ADD4></ADD4>
        <CITY>Sample City</CITY>
        <POSTCODE>E1W2BS</POSTCODE>
        <COUNTRY>UK</COUNTRY>
        <BULK_ADD1>General Manager</BULK_ADD1>
        <BULK_ADD2>The Big Company</BULK_ADD2>
        <BULK_ADD3>123 The High Street</BULK_ADD3>
        <BULK_CITY>Maintown</BULK_CITY>
        <BULK_COUNTRY></BULK_COUNTRY>
        <BULK_POSTCODE>MA1 1MA</BULK_POSTCODE>
        <BULK_COUNTRY>UK</BULK_COUNTRY>
        <CARRIER_TYPE>CAR_2</CARRIER_TYPE>
        <CARRIER_LOGO_ID>Logo1</CARRIER_LOGO_ID>
        <DELV_METHOD>2</DELV_METHOD>
        <DELV_CODE>BO29</DELV_CODE>
        <FULFIL1></FULFIL1>
        <FULFIL2></FULFIL2>
        <LANG>en</LANG>
      </CARRIER>
    </CARD>
    <TYPE>Chip&Mag</TYPE>
    <CURRENCY>0826</CURRENCY>
    <TRACK1>B1234567890123456^GIFTCARD/CORPORATE^1811122000009830000000
  </TRACK1>

  <TRACK2>1234567890123456=16102210000006064400</TRACK2>
  <TRACK3>123456789</TRACK3>
  <EMBOSS_PAN>1234 5678 9012 3456</EMBOSS_PAN>
  <EMBOSS_NAME>MR AN OTHER</EMBOSS_NAME>
  <EMBOSS_START>11/11</EMBOSS_START>
  <EMBOSS_EXPIRY>10/16</EMBOSS_EXPIRY>
  <EMBOSS_CVC2>1234 157</EMBOSS_CVC2>
  <EMBOSS_LINE4></EMBOSS_LINE4>
  <THERMAL_LINE1></THERMAL_LINE1>
  <THERMAL_LINE2></THERMAL_LINE2>
  <IMAGE_ID>img00124</IMAGE_ID>
  <LOGO_FRONT_ID>logo_HSBC</LOGO_FRONT_ID>
  <LOGO_BACK_ID></LOGO_BACK_ID>
  <QRCODE>https://www.flex-e-
card.com/balance/2909680989632389</QRCODE>
  <CHIP>
    <TYPE>MASTERCARD</TYPE>
    <PAN>1234567890123456</PAN>
    <PAN_SEQ>01</PAN_SEQ>
    <NAME>OTHER/MR AN</NAME>
    <START_DATE>111101</START_DATE>
    <EXPIRY_DATE>161031</EXPIRY_DATE>
    <SERVICE_CODE>221</SERVICE_CODE>
    <CHIP_TRACK_1>B1234567812345678^OTHER/MR AN
^1610221000004600000000</CHIP_TRACK_1>
    <CHIP_TRACK_2>1234567812345678D16102210000006046000F</CHIP_TRAC
K_2>

```

```
<PINBLOCK>3A56DFF541C12197</PINBLOCK>
<CHIP_TRACK_1_MSD_CL>B1234567812345678^
/^1610221000004600000000</CHIP_TRACK_1_MSD_CL>
<CHIP_TRACK_2_MSD_CL>1234567812345678D161022100000001</CHIP_TRA
CK_2_MSD_CL>
    </CHIP>
  </CARD>
</RECORD>
</PRODUCT>
</CARDGEN>
```

4. Document History

Version	Date	Description	Revised by
12.3	11/08/2022	The values in the QRCode field can now be updated using Web Services. Field size updated from 50 to 100 characters.	WS
12.2	20/08/2021 07/09/2021	PRODUCT_REF field maximum length updated to 50 characters. GPS office address update	WS
12.1	24/05/2021	Review and update to language.	WS
12.0	13/05/2021	New Guide template and layout. Added section on XML reserved markup characters.	WS
11.01	17/12/2020	Clarification of usage of BULK_ADD fields and DELV_CODE (bulk address and delivery code) No change to file layout.	IF
11.00	10-March-2020	Added MOBILE to CARRIER section. Only appears for version 11.00 and higher.	IF
10.02	10/03/2020	Updated description of TRACK2 and CHIP_TRACK_2 for VISA. Added 00000 to each.	IF
10.01	16/01/2020	Clarified descriptions of all CHIP Track data fields, to aid understanding of the usage of them: CHIP_TRACK_1 , CHIP_TRACK_2 , CHIP_TRACK_1_MSD_CL , CHIP_TRACK_2_MSD_CL Corrected the description of the PINBLOCK field, and an example is supplied. Clarified COUNTRY and BULK_COUNTRY code values. Clarified SERVICE_CODE values. Added description for PAN and PAN_SEQ values. Table headings now repeated on each page and prevent rows from breaking across pages if possible.	MD

Version	Date	Description	Revised by
10.0	26/03/2019	Added BULK_COUNTY to the CARRIER section	IF
9.03	21/03/2016	Corrected max length of TRACK1 and updated description Corrected max length of TRACK2 and updated description Corrected max length of TRACK3 and updated description Corrected max length of CHIP_TRACK_1 Corrected max Length of CHIP_TRACK_2 Corrected max length of CHIP NAME Corrected max length of CHIP_TRACK_1_MSD_CL Corrected max length of CHIP_TRACK_2_MSD_CL Updated list of possible CARD TYPEs. Updated list of possible CHIP TYPEs No change to file layout.	MD
9.02	4/03/2016	Clarified file naming convention further. No change to file layout.	IF
9.01	18/01/2016	Added documentation about PIN block format, no change to file layout.	IF
9	15/12/2015	Corrected File Naming convention Added new optional tag CHIP_TRACK_1_MSD_CL	
8.02	30/04/2015	Changed length and description of BULK_COUNTRY Increased length of REQUEST_TYPE and added new options for PIN Mailers	
8.01	19/01/2015	Corrections to spec: Track1 increased to 79	
8	9/10/2014	Added PINBLOCK as an optional element in the CARD structure	

Version	Date	Description	Revised by
7		Moved REQUEST_TYPE from <PRODUCT> container to <RECORD> CHIP_TRACK_1 will be present for Mastercard AND VISA Detailed contents of Track data Moved LANG to its correct position Added new optional tag CHIP_TRACK_2_MSD_CL	
6	03/09/2013	Added LANG to CARRIER element Added CARRIER_LOGO_ID to CARRIER element Added QRCODE to CARD element Changed all CARRIER elements to allow NULLs Increased maximum length of Track 1 to show maximum length GPS will currently output . N.B. ISO specifications allow for maximum of 79 in Track 1 Added CHIP_TRACK_1 (only for VISA cards) Changed COUNTRY from Varchar(20) to char(3) Numeric ISO Country code Added CVV1 to sample Track 1 layout	IF
5.01	26/03/2013	Added ORDER_REF to CARDSUM element	IF
5	08/02/2013	Added new fields to support Bulk Delivery Address	IF
4.01	10/09/2012	Replaced <ADD5> with <CITY> in the <CARRIER> element. Clarified Country ISO code. Added XML closing tags for clarity.	IF
4.0	28/02/2012	Added new fields to support Bulk Delivery, Simplex Line 4, Currency, Thermal Lines 1 & 2, Front & Logo images. Defined maximum field sizes that were not already defined.	IF