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EMV – Banking and Retail

Horizon - LINK Mapping

ROLE	NAME	AREA OF RESPONSIBILITY	SIGNATURE	DATE
Authors	Rex Dixon on behalf of Post Office Ltd	**Business Architecture**		
		Product Deployment		
		Technical Architecture		
DA Sign-off (Peer Reviewer)	David Gray	**Design Authority**		
Project Manager	Ian Oakley	**Project Delivery**		
Fujitsu Services Sign-off	John Burton			

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1 Document Control

1.1 Document Information

Horizon Release No:	T40
Document Title:	EMV Banking and Retail – Horizon - LINK Mapping
Document Type:	Application Interface Specification
Abstract:	This document details the mapping of messages between Horizon and LINK.
Document Status:	Approved
Originator & Department:	David Gray Design Authority
Contributors:	
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Supplier Distribution:	LINK – Geoff Barker Fujitsu Services – Gill Jackson
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Table 1: Document Information

1.2 Document History

Version	Date	Reason for Issue	Associated WP / CT
0.1	28 May 2004	First working draft. Based on document supplied by IBM, "Network Banking Engine Horizon - LINK Mapping", but changed to map the messages processed by NBX, and to include ICC fields.	
0.2	07 Jul 2004	Minor corrections and changed to the form of a Post Office document.	
0.3	21 Oct 2004	Corrections resulting from review.	
0.4	29 Oct 2004	Minor amendments resulting from AIS and business parameter changes.	
1.0	4 Nov 2004	Minor clarification and issued for Approval	
1.1	26 May 2005	Updated for CT 363 and for minor corrections discovered during testing prior to initial release at Horizon release S75	CT 363 / CP 3997
1.2	3 Aug 2005	Corrections from review cycle and LINK re-accreditation testing.	

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2.0	15 Aug 2005	Issued for Sign-off	
2.1	5 Dec 2006	Add in PIN Change Functionality for LINK Migration from LIS 2005-1 to 2007-1 for LINK.	CT 573 / CP 4295
2.2	9 Jan 2007	Corrections resulting from review	
3.0	19 Mar 2007	Issued for Sign-off	

Table 2: Document History

1.3 Change Process

Any changes to this issued version of this document will be made, controlled and distributed by: - IT_Controlled_Document_review GRO

1.4 Review Details

Review Comments by :	
Review Comments to :	Rex Dixon, Fujitsu Services

Mandatory Review Authority	Name
Post Office Ltd	David Gray
Fujitsu Services Ltd	
Analysis & Solution Specification	Gareth Jenkins
SI DU Design Authority	Tom Northcott
SI DU Design Team Designer	Rex Dixon
CS System Support Centre Manager	Mik Peach
Test Design	Sheila Bamber
LINK	Michael Abendstern
Optional Review / Issued for Information	
Post Office Ltd	Bob Booth, Seamus Scullion,
Fujitsu Services Ltd	
Release Manager	James Stanton
DU Development Team Leader	Peter Ambrose
LINK	

1.5 Changes in this Version

Version	Changes
3.0	Issued for Sign-off
2.2	Added PI to list of abbreviations Corrected message type in cell A2 on PIN Change Reversal Request worksheet

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	Changed mapping of field 123 for PIN Change Reversal Request Corrected RRN length to precisely 12 where it was given as "..12" Changed note on Amount_Confirmed for PIN Change Reversal Request Corrected conditionality of field 142 for PIN Change Reversal Request
2.1	Add PIN Change functionality Add PIN Change Request and PIN Change Response Tabs to spreadsheet Add Change Reversal (E1) and Pin Change Reversal Response (E2) Tabs to spreadsheet Remove Hidden columns from spreadsheet Add Reversal Reason 23 Add subfield 13 to field 061 for migration to LIS5 2007-1
2.0	Gill Jackson added as signatory for Fujitsu Services
1.2	Some reviewer names and the copyright statement updated. Balance Enquiry worksheet – Point of Service Data (bitmap ref 061): subfields 9 and 12 updated to reflect change in the AIS, NB/IFS/024. Note that this reflects on to the Withdrawal and Deposit worksheets. [FS Peaks 123730 & 123623]
1.1	Section 1.1 – Horizon Release updated to S80R. Balance Enquiry worksheet – Authorisation Data (bitmap ref 123): removed from 0100 message. [POL Incident 1153; FS Peak 108959]

Table 3: Changes in this Version

1.6 Key Contacts

Name	Position	Phone Number
Bob Booth	Solutions Architect	GRO
Michael Abendstern	Technical Specialist	
Rex Dixon	Design Architect	

Table 4: Key Contacts

1.7 Associated Documents

	Reference	Version	Date	Title	Source
.	LIS5	2007-1 Vsn 1.0		LINK Switch Service Interchange Standard – LINK ATM Scheme Service	LINK
.	NB/IFS/024			NBX-LINK Application Interface Specification (AIS)	Post Office
.		2007-1 Vsn 1.0		LINK Switch Service Interchange Standard – LINK Deposits Service	LINK
.		2007-1 Vsn 1.0		LINK Switch Service Interchange Standard – LINK PIN Management Service	LINK
.	NB/IFS/004			Network Banking Message Flows and	Fujitsu Services

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				Interfaces	

Table 5: Associated Documents

Unless a specific version is referred to above, reference should be made to the current approved versions of the documents.

1.8 Abbreviations/Definitions

Abbreviation	Definition
Authorisation Agent	The part of the NBX which interfaces to FIs and carries out the message mapping.
BCD	Binary Coded Decimal
FI	Financial Institution
NBE	Network Banking Engine
NBX	The term used to describe the NBE functionality absorbed into the Horizon domain.
PI	Process Interface, the processing component in an FI

Table 6: Abbreviations/Definitions

In addition, the message names [A1], [R3], [E1], [E2] and the abbreviations for their field formats are used as in ref [2], while the names and field format abbreviations for the messages [R1], [A3], [C0] are as in ref [5].

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2 Introduction

This document identifies the data mapping between the various message elements of the message sets where NBX acts as the conduit between Horizon and LINK. It should be used in conjunction with the AIS (Ref [2]). Any translations that need to be performed to convert from one particular message format to another are identified, together with how the translation is achieved, where possible. In addition, the data that is required by a message, but which is not present in the source message from another message set, is identified together with an alternative source.

The following sources can be used to populate a message:

Transaction messages	Data is mapped from a message element in one message to a corresponding message element in another, possibly undergoing translation.
Configuration	The exact locations of configuration data will be specified in the design documentation, but the essential property of values that are stated to be configurable is that they can accommodate rapid amendment or extension as required. Note that where a field is common to a number of messages, configurable mappings are based on configuration data that is also common to all the messages. So the mapping of such common fields can be configured only once and applies to all LINK messages, it is not configured individually on a per-message basis.
System Date	The date as held on the NBX Authorisation Agent system.
System Time	The time as held on the NBX Authorisation Agent system.
Fixed Value	Data that always has a fixed value

2.1 Scope

The document considers the following message mappings:

Balance Enquiry	[R1] to [R3] 0100
PIN Change	[R1] to [R3] 0100
Withdrawal	[R1] to [R3] 0200
Deposit	[R1] to [R3] 0200
Balance Enquiry Response	[A1] 0110 (or [R1]) to [A3]
PIN Change Response	[A1] 0110 (or [R1]) to [A3]
Withdrawal Response	[A1] 0210 (or [R1]) to [A3]
Deposit Response	[A1] 0210 (or [R1]) to [A3]
Financial Reversal Request	[R3],[A1] and possibly [C0] to [E1] 0420/0421
PIN Change Reversal Request	[R3],[A1] and possibly [C0] to [E1] 0624/0625
Response Codes	
Reversal Reason Codes	

Reversal Request Response [E2] messages received from LINK are only used internally within the NBX (i.e. they are not mapped to a Horizon message), and so are not within the scope of this document.

2.2 Structure

The message mappings are contained in an Excel spreadsheet, which has been embedded in this document. To open the spreadsheet, double-click on the attachment icon. The first sheet contains a summary of the message mappings that are included in the scope of this document. Subsequent sheets detail each of the mappings in turn.

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3 Notes on the Spreadsheet

For each message pair, the triggered message is shown on the left, with the triggering (or source) message on the right. The exception to this is the “Reversal Request” [E1] message, which can be triggered either by a [C0] message, or by a late [A1] Approve response from LINK, and is populated from a number of other messages. In this case the right of the sheet contains elements from each of these messages, and an additional column has been included to indicate which message the element comes from.

The “Source” column contains the details of how the message element in the triggered message is populated, including the mapping between message elements in each of the messages where applicable. The “Source” column also includes a description of any translations that need to take place in the NBX.

A greyed out row in the triggering message indicates that there is a field in the triggered message that is not populated from data contained in that source message. In these cases, the triggered message field may be populated from a different message, determined by the NBX or taken from Reference Data. Fields that have been identified as being not required in the NBX – LINK Application Interface Specification document, Reference [2], have not been included in the message.

A greyed out row in the triggered message column indicates that there is a field in the triggering message that has no corresponding field in the triggered message.
For example, fields provided in a LINK message that do not map onto a Horizon field, are not passed on by the NBX, but are logged.

Similarly there are fields provided in a Horizon message that do not map onto a LINK field, and are not passed on. The full list of fields in Horizon messages and their definitions and uses can be found in [5]; the following fields which are not directly mapped to LINK messages are nevertheless relevant to NBX for the following purposes:

Clerk_Identity	Records identity of clerk operating at the outlet workstation (also known as node or counter). This is required for audit purposes.
Client_Id	Identifies a client of POL that is the end bank (card issuer) for a transaction. This element is needed for reconciliation and reports.
Digital Signature	Used in conjunction with Signature_Type to check that the message is valid.
Issuer_Scheme_Id	A code to identify the Issuer Scheme, set from Reference Data at the counter.
Message_Type	Classifies the type of message being sent. e.g. R1 or C0.
Routing_Gateway	Use to route transactions to the correct logical PI
Signature_Type	Used in conjunction with Digital Signature to check that the message is valid.

Transactions are uniquely identified in the system by a combination of the Riposte Group ID and Node ID of the originating counter, together with the receipt transaction date (year and day), and the last 6 digits of the message number component of the Horizon_Txn_Num field of the message which originated the transaction. In messages to LINK this information is held in the form of the Terminal Identification (which is made up from the Riposte Group ID and Node ID) and the Retrieval Reference Number (which includes the receipt transaction date and message number information).

The following point should be noted with regard to the use of binary coded decimal fields in ICC data: in communication with the counter this data is transferred using one character for each decimal digit, but if there is an odd number of digits, an extra padding character, a zero, is included at the start of the number. It follows, for example, that a field shown in the spreadsheet as having 3 BCD digits would actually be transmitted as 4 characters, the first being a zero used for padding. This encoding facilitates the counter's communications with the Pin Pad. The spreadsheet indicates in such cases whether or not the padding is retained when mapping the messages.

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4 Message Mapping Spreadsheet

"Horizon - LINK Mapping.xls"

END OF DOCUMENT