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EMV – Banking and Retail

Horizon - LINK Mapping

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1 Document Control

1.1 Document Information

Horizon Release No:	S75
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
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Contributors:	
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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	

Table 2: Document History

1.3 Change Process

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

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1.4 Review Details

Review Comments by :	
Review Comments to :	

Mandatory Review Authority	Name
Post Office Ltd	Beverley Dunn, David Gray, Post Office Ltd
Fujitsu Services Ltd	Tony Drahota
LINK	Michael Abendstern
Optional Review / Issued for Information	
Post Office Ltd	Bob Booth, Paul Warbrick, Jason Crellin
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Fujitsu Services Ltd	Chris Bailey, Peter Lucas, Rex Dixon, Tom Northcott, Steve Probert, Richard Hicks, David Johns, Simon Fawkes, Mark Jarosz, Janusz Holender, Nasser Siddiqi, Steve Newman, Anne Mohan, John Rayner

1.5 Changes in this Version

Version	Changes
0.1	N/A. This is the first version.
0.2	Re-issued as a Post Office document. In [R3]: Third digit of Point of Service Entry Mode and subfield 8 of Point of Service Data made a configurable mapping of [R1] Txn_Type. Application PAN Sequence Number mapped from ICC tag 5F34, and not mandatory for non-ICC transactions. In [A3]: Removal of Bank_Transaction_Id and Settlement_Date from [A3] generated when there is no [A1]. Point of Service Data Clarifcations and correction of typing errors.
0.3	Response code 90 added. Use of "Fee" field in [A3] clarified. Use of Start_Date (as input to [R1] fields 23 and 123) clarified. Distribution list corrected. Corrected first character of field 60 in [E1] for ICC. Various typing errors fixed as per comments. The spreadsheet columns containing historical information about NBE have been hidden.
0.4	Mapping for subfield 2 of field 61 adjusted to align with change to AIS. Clarified that, regardless of transaction type, NBX does not return balances to the counter if the response code for the transaction was neither 00 (authorised) nor 51 (insufficient funds), even if balances have been received from the FI.

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	Specified Reversal Reason Code mapping for the case where the card declines a transaction after it has been authorised by the FI.
1.0	Clarified that in the case of transactions whose details are entered manually, the presence of an Application PAN Sequence Number (field 023) in a request depends on whether reference data is configured to cause the card issue number to be entered.

Table 3: Changes in this Version

1.6 Key Contacts

Name	Position	Phone Number
Bob Booth	Solutions Architect	GRO
Michael Abendstern	Technical Specialist	
Phil Turner	Design Architect	

Table 4: Key Contacts

1.7 Associated Documents

	Reference	Version	Date	Title	Source
.	LIS5	2004-1 Vsn 1.1		LINK Switch Service Interchange Standard (LIS5)	LINK
.	NB/IFS/0024			NBX-LINK Application Interface Specification (AIS)	Post Office
.		1.2		LIS5 – Deposits "What's New"	LINK
.	NB/IFS/004			Network Banking Message Flows and Interfaces	Fujitsu Services

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

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	Horizon domain.

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 [4].

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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
Withdrawal	[R1] to [R3] 0200
Deposit	[R1] to [R3] 0200
Balance Enquiry Response	[A1] 0110 (or [R1]) to [A3]
Withdrawal Response	[A1] 0210 (or [R1]) to [A3]
Deposit Response	[A1] 0210 (or [R1]) to [A3]
Reversal Request	[R3],[A1] and possibly [C0] to [E1] 0420/0421
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 [4]; 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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(The spreadsheet also contains some historical information about the mappings performed by the original NBE system, but the rows and columns containing this information are hidden and so are not seen when looking at the spreadsheet. They do not need to be considered with regard to the NBX system.)

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4 Message Mapping Spreadsheet

"Horizon - LINK Mapping.xls"

END OF DOCUMENT