EMV®
Contactless Specifications for Payment Systems

Book B

Entry Point Specification

Version 2.10
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Revision Log – Version 2.10

This section outlines the notable updates that have been made to this specification since the publication of the *EMV Contactless Specifications for Payment Systems, Book B Entry Point Specification, Version 2.9*.

- The version number and publication date have been changed in this version.

Contents

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1 Scope

This specification, the *EMV Contactless Specifications for Payment Systems Specifications for Payment Systems, Entry Point Specification,* defines the reader requirements necessary to support a multi-kernel architecture that enables:

- discovery and selection of a contactless application that is supported by both the reader and the card, and
- activation of the appropriate kernel for processing the contactless transaction in an international interchange environment.

1.1 Underlying Standards

This specification is based on the ISO/IEC 7816 and ISO/IEC 14443 series of standards and should be read in conjunction with those standards. However, if any provision or definition in this specification differs from those standards, the provision or definition herein shall take precedence.

1.2 Audience

This specification is intended for use by manufacturers of readers. The specification may also be of interest to manufacturers of contactless cards and financial institution staff responsible for implementing financial applications in contactless cards.

1.3 Overview

This volume includes the following chapters and annexes.

Chapter 1 contains general information that helps the reader understand and use this specification.

Chapter 2 lists related specifications and standards.

Chapter 3 describes Entry Point functionality, including pre-processing, protocol activation, combination selection, kernel activation, and Outcome processing.

Annex A defines the data elements used in this specification.

Annex B is a glossary of terms and abbreviations used in this specification.

2 References

2.1 Volumes of the Contactless Specifications

This specification is part of a nine-volume set:

Book A: Architecture and General Requirements

Book B: Entry Point Specification

Book C-2: Kernel 2 Specification

Book C-3: Kernel 3 Specification

Book C-4: Kernel 4 Specification

Book C-5: Kernel 5 Specification

Book C-6: Kernel 6 Specification

Book C-7: Kernel 7 Specification

Level 1 Specifications for Payment Systems, EMV Contactless Interface Specification

2.2 Related Specifications

[EMV 4.3 Book 1]	*EMV Integrated Circuit Card Specifications for Payment Systems*, version 4.3, Book 1, Application Independent ICC to Terminal Interface Requirements, November 2011.
[EMV 4.3 Book 3]	*EMV Integrated Circuit Card Specifications for Payment Systems*, version 4.3, Book 3, Application Specification, November 2011.
[EMV L1 Contactless]	*EMV Level 1 Specifications for Payment Systems, EMV Contactless Interface Specification, Version 3.0*
[ISO 4217]	Codes for the representation of currencies and funds.

3 Entry Point Functionality

Entry Point consists of five main functional sections:

1. Preliminary transaction processing (hereafter called Pre-Processing): Processing prior to the activation of the contactless interface of the reader and before the cardholder is invited to present a contactless card. Specifics of Pre-Processing are defined in section 3.1.
2. Protocol Activation: Activation of the contactless interface. Specifics of Protocol Activation are defined in section 3.2.
3. Combination Selection: Selection of the Combination to use for the transaction. Specifics of Combination Selection are defined in section 3.3.
4. Kernel Activation: Entry Point activates the selected kernel and this begins kernel processing. Specifics of Kernel Activation are defined in section 3.4.
5. Outcome Processing: Entry Point processes an Outcome according to the type of Outcome and the values of the Outcome parameters. Specifics of Outcome Processing are defined in section 3.5.

Entry Point has four starting points, as shown in Table 3-1.

Table 3-1: Starting Points

	Start at	Activation
Start A	Pre-Processing	Start at Pre-Processing; activated by the reader when Autorun is 'No'.[1] This is typical for a new transaction with a variable amount in an EMV mode acceptance environment.
Start B	Protocol Activation	Activated in any of the following cases: • activated by the reader when Autorun is 'Yes';[1] this is typical for a new transaction with a fixed amount in a mag-stripe mode acceptance environment, or • activated by the reader to handle issuer responses after an ***Online Request*** or ***End Application*** Outcome with parameter Start = B, or • handled internally by Entry Point for an error situation, or • handled internally by Entry Point for a ***Try Again*** Outcome
Start C	Combination Selection	Handled internally by Entry Point for a ***Select Next*** Outcome.
Start D	Kernel Activation	Activated by the reader to handle issuer responses after an ***Online Request*** or ***Request Online PIN*** Outcome with parameter Start = D.

Each Start has conditions that must be satisfied by the reader or terminal before Entry Point is activated. The specific requirements are defined in the appropriate section.

The starting points support the needs of the seven EMV kernels contained within this version of the specification.

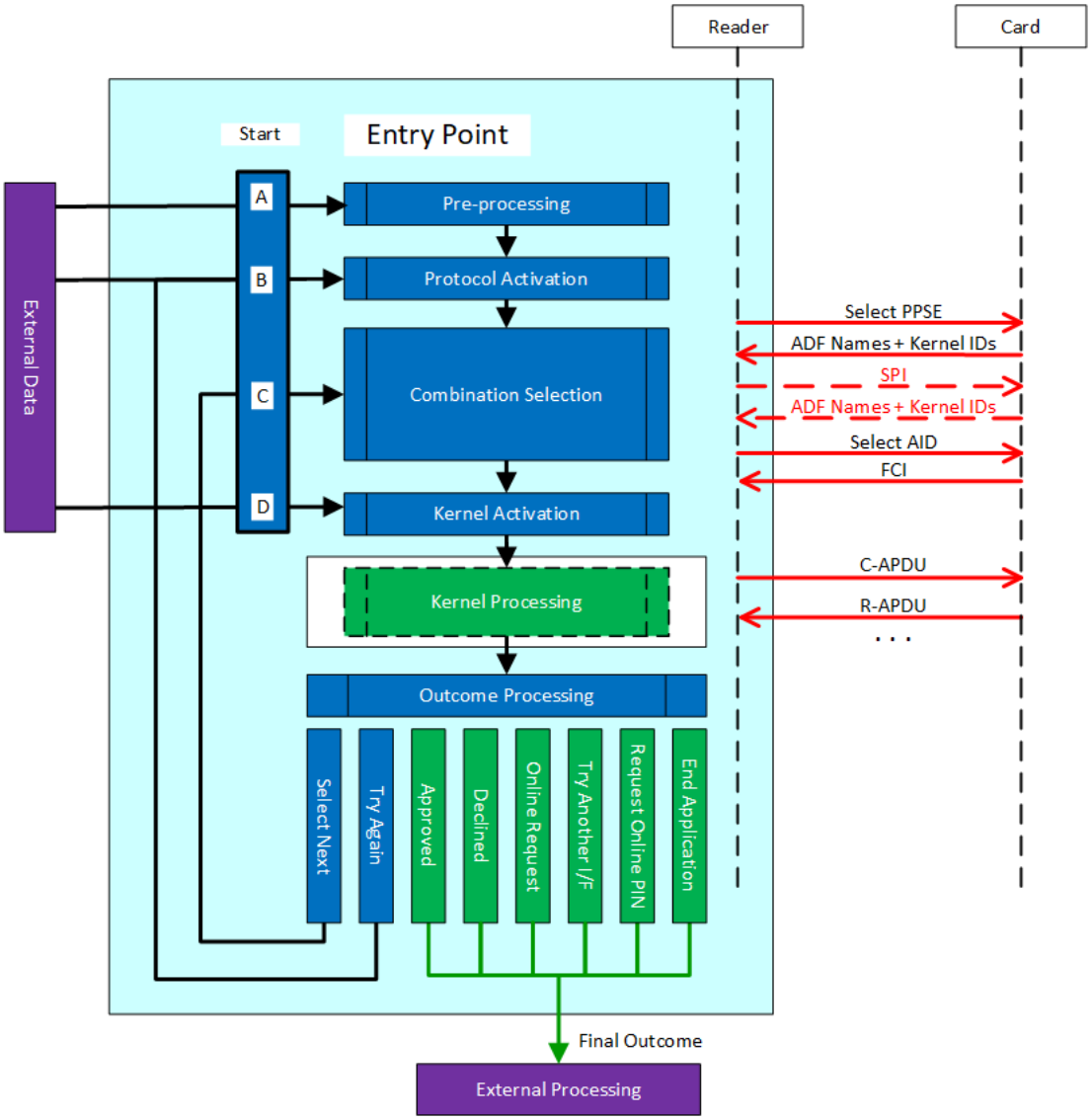
[1] Autorun is discussed in Book A.

Each new contactless transaction begins at **Start A** or **Start B** depending on whether the transaction amount (as represented by Amount, Authorised) is variable or not. A transaction amount is deemed to be invariable if for the given reader configuration it is always the same for all transactions so that Pre-Processing may be pre-computed for all transactions.

Entry Point activates the card and selects the appropriate kernel, which then conducts the contactless transaction with the card, until it finishes with an Outcome. ***Try Again*** and ***Select Next*** Outcomes are immediately processed by Entry Point, which re-starts at the appropriate point. All other Outcomes are considered to be Final Outcomes and processing reverts to the reader and terminal. In some cases, such as ***Approved*** or ***Declined*** Outcomes, the transaction is complete and no further processing from Entry Point and the kernel is required. In other cases, such as an ***Online Request*** or ***Request Online PIN*** Outcome, then after the reader and terminal have dealt with the expected functionality, if applicable, Entry Point will be started at the requested Start so that a kernel can complete the transaction.

The various start locations and the Outcome concept allows Entry Point to support a wide range of kernel expectations. These concepts of Entry Point processing are illustrated in Figure 3-1.

Figure 3-1: Entry Point High Level Architecture



Entry Point is designed around the use of a Proximity Payment System Environment (PPSE) as the selection mechanism. For multi-brand acceptance, this allows a reader to quickly obtain all the available brands and applications with a single command and to make an immediate choice based on priority and kernel availability.

3.1 Pre-Processing – *Start A*

Entry Point is initiated at Pre-Processing for a new transaction with a variable amount.

Each reader Combination {AID - Kernel ID} may have a set of Entry Point Configuration Data, as defined in Book A, Table 5-2, including CVM, floor limit(s), online/offline capability, extended selection support, and contactless transaction limit. If present, these limits are examined during Pre-Processing. The result is a set of flags and data elements for each Combination; one of which will be used to define the attributes of the transaction. The flags and limits referenced in this section are all part of Entry Point Configuration Data as outlined in Book A, Table 5-2.

The indicators referenced in this section are all part of Entry Point Pre-Processing Indicators as outlined in Book A, Table 5-3.

In some reader implementations, for instance a vending machine with identically priced goods, the results of Pre-Processing do not vary per transaction and are made available as configuration data for **Start B**.

Pre-Processing may set the Entry Point Pre-Processing Indicators per reader Combination {AID - Kernel ID} as defined in Book A, Table 5-3.

Entry Point uses the ‘Contactless Application Not Allowed’ indicator to indicate that the transaction cannot take place for this Combination.

A Copy of Terminal Transaction Qualifiers (TTQ) may be requested in the PDOL (with Tag '9F66'[2]) of contactless applications that require this data element to obtain indication of the reader contactless capabilities and transaction requirements.

The technical details and the requirements of the Pre-Processing are documented in section 3.1.1.

3.1.1 Pre-Processing Requirements

This section addresses the requirements for Pre-Processing.

If TTQ (see Book A, Table 5-4) is configured for a Combination, it will be modified during Pre-Processing. These modifications are transient and do not affect the original configuration values.

[2] This is a payment system specific tag used by Kernels 3, 6 and 7.

Requirements – Pre-Processing	
3.1.1.1	For each Combination, Entry Point shall reset the Entry Point Pre-Processing Indicators as defined in Table 5-3 of Book A (Entry Point Pre-Processing Indicators) to 0.
3.1.1.2	**If** Terminal Transaction Qualifiers (TTQ) is part of the configuration data for a Combination, **then:** • Entry Point shall copy the TTQ from Entry Point Configuration Data (see Book A, Table 5-2) into the Copy of TTQ in the Entry Point Pre-Processing Indicators. • Entry Point shall reset byte 2, bit 8 and bit 7 in the Copy of TTQ to 00b ('Online cryptogram not required' and 'CVM not required'). The other bits are unchanged.[3]
For each Combination, Entry Point shall perform the following actions:	
3.1.1.3	**If** all of the following are true: • the Status Check Support flag is present, • **and** the Status Check Support flag is 1, • **and** the Amount, Authorised is a single unit of currency, **then** Entry Point shall set the 'Status Check Requested' indicator for the Combination to 1.

[3] By copying TTQ into the Copy of TTQ during this step, the static configuration bits of TTQ replace the bits cleared in the Entry Point Pre-Processing Indicators as stated in requirement 3.1.1.1.

Requirements – Pre-Processing	
3.1.1.4	**If** the value of Amount, Authorised is zero, **then**: • **If** the Zero Amount for Offline Allowed flag is present **and** the Zero Amount for Offline Allowed flag is 1, **then** Entry Point shall proceed with next requirement 3.1.1.5. • **Otherwise**, - **If** the Zero Amount Allowed flag is present **and** the Zero Amount Allowed flag is 0, **then** Entry Point shall set the 'Contactless Application Not Allowed' indicator for the Combination to 1. - **Otherwise**, Entry Point shall set the 'Zero Amount' indicator for the Combination to 1.
3.1.1.5	**If** the Reader Contactless Transaction Limit is present **and** the value of Amount, Authorised is greater than or equal to this limit, **then** Entry Point shall set the 'Contactless Application Not Allowed' indicator for the Combination to 1.
3.1.1.6	**If** the Reader Contactless Floor Limit is present **and** the value of Amount, Authorised is greater than this limit, **then** Entry Point shall set the 'Reader Contactless Floor Limit Exceeded' indicator for the Combination to 1.
3.1.1.7	**If** all of the following are true: • the Reader Contactless Floor Limit is not present, • **and** the Terminal Floor Limit (Tag '9F1B') is present, • **and** the value of Amount, Authorised is greater than the Terminal Floor Limit (Tag '9F1B'), **then** Entry Point shall set the 'Reader Contactless Floor Limit Exceeded' indicator for the Combination to 1.
3.1.1.8	**If** the Reader CVM Required Limit is present **and** the value of Amount, Authorised is greater than or equal to this limit, **then** Entry Point shall set the 'Reader CVM Required Limit Exceeded' indicator for the Combination to 1.

Requirements – Pre-Processing	
For each Combination that has a TTQ, Entry Point shall perform the following actions:	
3.1.1.9	**If** the 'Reader Contactless Floor Limit Exceeded' indicator is 1, **then** Entry Point shall set byte 2, bit 8 in the Copy of TTQ for the Combination to 1b ('Online cryptogram required').
3.1.1.10	**If** the 'Status Check Requested' indicator is 1, **then** Entry Point shall set byte 2, bit 8 in the Copy of TTQ for the Combination to 1b ('Online cryptogram required').
3.1.1.11	**If** the 'Zero Amount' indicator is 1, **then**: • **If** byte 1, bit 4 of the Copy of TTQ is 0b ('Online capable reader'), **then** Entry Point shall set byte 2, bit 8 in the Copy of TTQ for the Combination to 1b ('Online cryptogram required'). • **Otherwise** (byte 1 bit 4 of the Copy of TTQ is 1b ('Offline-only reader')), Entry Point shall set the 'Contactless Application Not Allowed' indicator for the Combination to 1.
3.1.1.12	**If** the 'Reader CVM Required Limit Exceeded' indicator is 1, **then** Entry Point shall set byte 2, bit 7 in the Copy of TTQ for the Combination to 1b ('CVM required').

Requirements – Pre-Processing

When Pre-Processing for all Combinations has been performed, Entry Point shall perform the following action:

3.1.1.13 **If**, for all the Combinations, the 'Contactless Application Not Allowed' indicator is 1,
then Entry Point shall provide a ***Try Another Interface*** Outcome with the following Outcome parameter values and shall continue with Outcome Processing, section 3.5.

Try Another Interface:

- **Start:** N/A
- **Online Response Data:** N/A
- **CVM:** N/A
- **UI Request on Outcome Present:** Yes
  - **Message Identifier:** '18' ("Please Insert or Swipe Card")
  - **Status:** Processing Error
- **UI Request on Restart Present:** No
- **Data Record Present:** No
- **Discretionary Data Present:** No
- **Alternate Interface Preference:** N/A
- **Receipt:** N/A
- **Field Off Request:** N/A
- **Removal Timeout:** Zero

Otherwise (at least one Combination is allowed) Entry Point shall retain the Entry Point Pre-Processing Indicators for each allowed Combination.

3.2 Protocol Activation – *Start B*

Protocol Activation is either the next step after Pre-Processing, or Entry Point may be started at Protocol Activation for new transactions with a fixed amount or as **Start B** after Outcome Processing.

During Protocol Activation, polling is started for card discovery (if this has not already been performed) and appropriate User Interface messages are given. The retained Entry Point Pre-Processing Indicators and the Candidate List are available if required.

3.2.1 Protocol Activation Requirements

Requirements – Protocol Activation

3.2.1.1 **If** the Restart flag is 0,
then:

- **If** Entry Point is activated by the reader[4] at **Start B**,
  then:
  - **For each Combination**, Entry Point shall reset the Entry Point Pre-Processing Indicators to 0.
  - **For each Combination**,
    if Terminal Transaction Qualifiers (TTQ) is configured,
    then Entry Point shall copy the TTQ from Entry Point Configuration Data (see Book A, Table 5-2) into the Copy of TTQ in the Entry Point Pre-Processing Indicators.
- Entry Point shall clear the Candidate List.

[4] Error situations (e.g. timeout) or Outcomes handled directly by Entry Point (e.g. ***Try Again***) are not considered an activation by the reader.

Requirements – Protocol Activation

3.2.1.2 **If** the Restart flag is 1,
and the value of the retained[5] UI Request on Restart Present parameter is 'Yes',
then Entry Point shall send the retained User Interface Request.

Otherwise (the Restart flag is 0 or the value of the retained UI Request on Restart Present parameter is 'No'), Entry Point shall send a User Interface Request with the following parameters:

- Message Identifier: '15' (“Present Card”)
- Status: Ready to Read

3.2.1.3 The field shall be powered up and polling performed as defined in the Main Loop of *[EMV L1 Contactless]*.

Requirements – Protocol Activation – Collision

3.2.1.4 **If** a collision as defined in *[EMV L1 Contactless]* is reported to Entry Point,
then Entry Point shall send a User Interface Request with the following parameters:

- Message Identifier: '19' (“Please Present One Card Only”)
- Status: Contactless collision detected (Processing Error)

3.2.1.5 **When** the collision condition is no longer indicated,
then Entry Point shall send a User Interface Request with the following parameters:

- Message Identifier: '19' (“Please Present One Card Only”)
- Status: Ready to Read

Requirements – Protocol Activation – Higher Layer - INF

3.2.1.6 As described in *[EMV L1 Contactless]* requirement 6.4.1.12, Entry Point shall not use a higher layer command in the Higher layer - INF field of the ATTRIB command.

[5] As described in Book A, Requirements – Final Outcome Processing.

3.3 Combination Selection

Combination Selection is either the next step after Protocol Activation or Entry Point may be started at Combination Selection as **Start C** after Outcome Processing.

This section describes the product and kernel selection process. It specifies the logical structure of the data and files within the contactless card that are used for the process, and then describes the logic to use the card file structure.

Entry Point does not rely on an exclusive link between the product, defined by its Application Identifier (AID), and the kernel. A single product can run on different kernels. Within the reader, a Kernel ID is used to distinguish between different kernels that may be supported.

Note: To assist in a clear understanding of the process described in this section, it is necessary to distinguish between the term “Kernel ID” and the term “Kernel Identifier”. The term Kernel ID is used to identify the kernel(s) kept in the reader, and the term Kernel Identifier (tag ‘9F2A’) is used to identify the kernel(s) indicated by the card.

So in addition to the AID, Entry Point also needs information on which kernel to activate. The combination of AID and Kernel ID is further referred to as a reader Combination.

Following a method similar to the EMV contact application selection process, Entry Point constructs a list of Combinations mutually supported by the contactless card and the reader. If multiple Combinations are supported by both contactless card and reader, Entry Point selects the Combination with the highest priority.

For this purpose, the contactless card has a PPSE that contains a list of products and applications selectable over the contactless interface.

To recover the list of products and applications, Entry Point sends a SELECT (PPSE) command. The SELECT command is defined in *[EMV 4.3 Book 1]*, section 11.3.2.

The File Control Information (FCI, as defined in Table 3-2 below) in the response to the SELECT (PPSE) contains a list of Directory Entries identifying:

- a product supported by the card
- the Kernel Identifier of the kernel required for the specific application underpinning the product (conditional)
- the priority of the Combination (conditional)

In the card, the product is indicated by its ADF Name.

The kernel required for a specific card application is indicated by the Kernel Identifier (Tag '9F2A').

The priority of the Combination is indicated by means of an Application Priority Indicator with a value of '1' as the highest priority and 'F' the lowest. A value of '0' means no priority is assigned and has the same priority as 'F'.

In the reader, the product is indicated by the AID. Readers must be able to link AIDs to Kernel IDs.

Entry Point finds Combinations by matching pairs of data elements (ADF Name (Tag '4F') and Kernel Identifier (Tag '9F2A')) in the card with pairs of data elements in the reader (AID and Kernel ID).

Once all supported Combinations have been found and the highest priority Combination has been identified, Entry Point selects the associated card application by sending a SELECT (AID) command. The SELECT command is defined in *[EMV 4.3 Book 1]*, section 11.3.2.

If allowed by business agreement between the affected parties, specific applications may be eliminated from consideration either during or after building the candidate list.

3.3.1 PPSE Data for Application Selection

The PPSE begins with a DDF given the name ‘2PAY.SYS.DDF01’. For support of this specification, it is assumed that this DDF is present in the contactless card. The FCI returned upon the selection of the PPSE is indicated in Table 3-2.

Table 3-2: SELECT Response Message Data Field (FCI) of the PPSE

'6F'	FCI Template					M
	'84'	DF Name (‘2PAY.SYS.DDF01’)				O[6]
	'A5'	FCI Proprietary Template				M
		'BF0C'	FCI Issuer Discretionary Data			M
			'61'	Directory Entry		M
				'4F'	ADF Name	M
				'50'	Application Label	O
				'87'	Application Priority Indicator (see Table 3-3)	C[7]
				'9F2A'	Kernel Identifier (see Table 3-4 and Table 3-5)	C[8]
				'9F29'	Extended Selection (see Table A-1 on page 40)	C[9]
				‘9F0A’	Application Selection Registered Proprietary Data (ASRPD, see requirement 3.3.1.2)	O
			'61'	Directory Entry		O
				'4F'	ADF Name	M[10]
				'50'	Application Label	O[10]
				'87'	Application Priority Indicator	C[7,10]
				'9F2A'	Kernel Identifier	C[8,10]
				'9F29'	Extended Selection	C[9,10]
				‘9F0A’	Application Selection Registered Proprietary Data (ASRPD, see requirement 3.3.1.2)	O
			'61'	Directory Entry		O
				'4F'	ADF Name	M[10]
				'50'	Application Label	O[10]
				'87'	Application Priority Indicator	C[7,10]
				'9F2A'	Kernel Identifier	C[8,10]
				'9F29'	Extended Selection	C[9,10]
				‘9F0A’	Application Selection Registered Proprietary Data (ASRPD, see requirement 3.3.1.2)	O
			'9F3E'	Terminal Categories Supported List		O
			'9F3F'	Selection Data Object List (SDOL)		O

Additional data elements may be included in the FCI Issuer Discretionary Data (Tag 'BF0C') and Directory Entries (Tag '61'), for example, template '73'. Entry Point ignores such data elements and their usage is proprietary. Note that the order of data elements within the FCI may vary.

If the Kernel Identifier is absent from a Directory Entry, Entry Point bases its kernel decision upon the ADF Name:

- For a JCB ADF Name, it will use Kernel 5.
- For a MasterCard ADF Name, it will use Kernel 2.
- For a Visa ADF Name, it will use Kernel 3.
- For an American Express ADF Name, it will use Kernel 4.
- For a Discover ADF Name, it will use Kernel 6.
- For a UnionPay ADF Name, it will use Kernel 7.
- For any other ADF Name, it will use the kernel associated with the ADF Name.

ADF Names can be obtained from the relevant payment system.

Requirements – PPSE Data for Application Selection

3.3.1.1 The coding of the Application Priority Indicator is indicated in Table 3-3.

If the Application Priority Indicator is absent from a Directory Entry,
then Entry Point shall assume b4-b1 to have a value of 0000b.

[6] Tag '84' is Optional from a reader processing perspective, while from a card perspective it is considered a Mandatory data element to personalize.

[7] If the card supports multiple Combinations, each Combination should have its own Application Priority Indicator.

[8] If the card explicitly identifies the kernel to be used.

[9] If the card supports Extended Selection.

[10] Only relevant if this Directory Entry is present.

Requirements – Application Selection Registered Proprietary Data

3.3.1.2 Usage of the Application Selection Registered Proprietary Data (ASRPD) received from the ICC is optional and proprietary.

If Entry Point does not use ASRPD,
then Entry Point shall ignore instances of '9F0A' in Directory Entries (Tag '61') and continue processing as if the data was not present.

If Entry Point uses ASRPD,
then Entry Point interprets the value field to recover all the Proprietary Data Identifiers:

- **If** the value field of the ASRPD is not correctly formatted (ID L V, ID L V, … as defined below),
  then the Entry Point shall ignore this instance of the ASRPD and continue processing as if the data was not present. Note that no assumption can be made on the IDs already registered by EMVCo nor on the format of the value fields of the Proprietary Data Identifiers and as a consequence the value field of the ASRPD is considered to be incorrectly formatted only if a length problem is detected.

- **If** the value field of the ASRPD is correctly formatted,
  then proprietary functionality may be activated for the recognized Proprietary Data Identifiers.

- Entry Point is not required to keep track of the Proprietary Data Identifiers defined by EMVCo, therefore unrecognized Proprietary Data Identifiers shall be ignored.

Requirements – Application Selection Registered Proprietary Data

Requirements – Application Selection Registered Proprietary Data

The coding the ASRPD is as follows:

The value field of the ASRPD object follows the following format:
ID1, L1, V1, ID2, L2, V2,…

Where
· ID is a two byte Proprietary Data Identifier. Proprietary Data Identifiers are registered by EMVCo, and the ID registration process will be defined by EMVCo in a subsequent bulletin.
· L is the length of the value field coded in 1 byte (0 to 255) .
· V is the value field. Its content is proprietary and format is out of scope of EMVCo.

Table 3-3: Format of Application Priority Indicator

b8–b5	b4–b1	Definition
xxxx		Each bit RFU
	0000	No priority assigned
	xxxx (except 0000)	Priority order of the application to be selected, ranging from 1–15, with 1 being highest priority

The coding of the Kernel Identifier is indicated in Table 3-4 and Table 3-5.

Table 3-4: Format of the Kernel Identifier – Byte 1

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
x	x							Type of kernel
0	0							An international kernel, with a Kernel Identifier assigned by EMVCo and coded in the Short Kernel ID
0	1							RFU
1	0							A domestic kernel, with Kernel Identifier in EMVCo format, coded by the concatenation of the Short Kernel ID and the Extended Kernel ID (see Table 3-5)
1	1							A domestic kernel, with the Kernel Identifier in proprietary format, coded by the concatenation of the Short Kernel ID and the Extended Kernel ID (see Table 3-5)
		x	x	x	x	x	x	Short Kernel ID
		0	0	0	0	0	0	The kernel is associated with the corresponding ADF Name
		0	0	0	0	0	1	1st kernel
		0	0	0	0	1	0	Kernel 2
		0	0	0	0	1	1	Kernel 3
		0	0	0	1	0	0	Kernel 4
		0	0	0	1	0	1	Kernel 5
		0	0	0	1	1	0	Kernel 6
		0	0	0	1	1	1	Kernel 7
		0	0	1	0	0	0	8th kernel
		–	–	–	–	–	–	
		1	1	1	1	1	1	63rd kernel

Table 3-5: Format of the Kernel Identifier – Byte 2 to Byte 8[11]

<table>
<tr><th>Byte</th><th>Meaning</th></tr>
<tr><td>Byte 2</td><td rowspan="2">Extended Kernel ID:<table><tr><td>For international legacy kernel:</td><td>RFU</td></tr><tr><td>For domestic legacy kernel using the EMVCo format:</td><td>Currency Code as defined by [ISO 4217]</td></tr><tr><td>For domestic legacy kernel using a proprietary format:</td><td>Proprietary</td></tr></table></td></tr>
<tr><td>Byte 3</td></tr>
<tr><td>Byte 4</td><td>Each bit RFU</td></tr>
<tr><td>Byte 5</td><td>Each bit RFU</td></tr>
<tr><td>Byte 6</td><td>Each bit RFU</td></tr>
<tr><td>Byte 7</td><td>Each bit RFU</td></tr>
<tr><td>Byte 8</td><td>Each bit RFU</td></tr>
</table>

[11] Kernel Identifier is of variable size and may be one, three, or more bytes in length, but not two bytes.

3.3.1a Terminal Information During Application Selection

After the SELECT (PPSE) response is received by Entry Point, an additional phase of the application selection process may be performed where terminal information is provided to the card, allowing the card to send back a different list of supported applications to be used in the application selection process.

Entry Point support for this additional phase of the application selection process, including support of the SEND POI INFORMATION command and terminal data objects used, is implementation optional.

For example, the FCI of the PPSE returns a list of 3 applications, but after receiving terminal information that indicates the terminal is a transit device, the card may determine that one specific application is preferred for transit use and respond with only that one application for application selection.

The card requests terminal information during application selection by including one or more of the following data objects in the FCI Issuer Discretionary Data (tag 'BF0C') of the PPSE response message:

- Terminal Categories Supported List (tag '9F3E')
- Selection Data Object List (SDOL, tag '9F3F')

Upon receipt of the SELECT (PPSE) response, Entry Point issues the SEND POI INFORMATION (SPI) command when either of the following occurs:

- If the Terminal Category (POI Information ID '0001') of the terminal is on the Terminal Categories Supported List.
- If the SDOL is returned by the card.

Entry Point sends the SPI command in order to provide the requested data to the card. The SPI command is defined in Annex C.1.

The card responds to the SPI command with an FCI containing the list of applications to use for application selection. The list of applications in this FCI may be the same or may be different from the list of applications previously returned in the FCI of the SELECT (PPSE) response. Card determination of which applications to return in the FCI of the SPI response message is outside the scope of this specification.

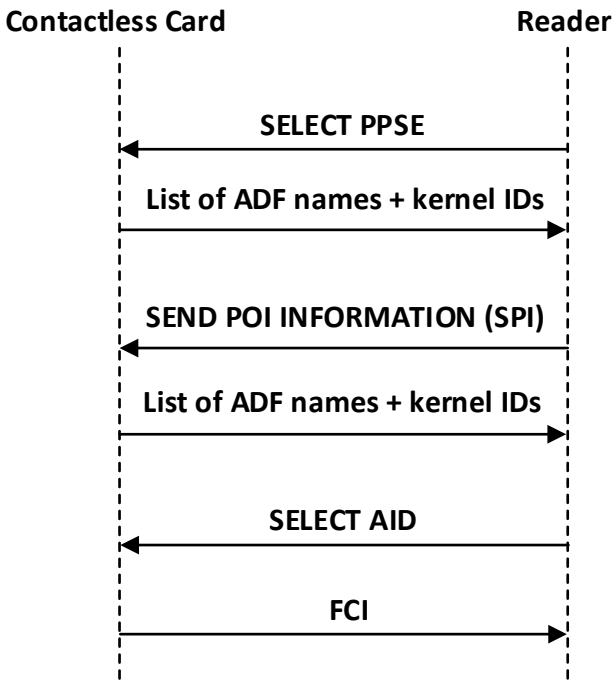
3.3.2 Selecting the Combination

The selection process of Entry Point follows to a large extent the EMV contact Application Selection requirements (*[EMV 4.3 Book 1]*, section 12.3.2) with the following exceptions:

- A PPSE is present in the contactless card.
- Usage of the PPSE is mandatory in Entry Point.
- The Directory Entries are located in the FCI Issuer Discretionary Data of the PPSE.
- Terminal information may be requested by the card, causing an additional command-response message to be sent.

Figure 3-2 illustrates the Command – Response APDU flow between contactless card and reader.

Figure 3-2: Entry Point Command-Response APDUs



Note: The response to the SELECT (AID) command is received and processed by Entry Point, including SW1 SW2.

Requirements – Combination Selection	
3.3.2.1	**If** Entry Point is activated by the reader at **Start B**, **then**: • **If** Issuer Authentication Data and/or Issuer Script is present, **then** processing shall continue at requirement 3.3.3.3 of Final Combination Selection with the Combination that was selected during the previous Final Combination Selection. • **Otherwise**, Entry Point shall perform steps 1 to 3. **Else if** Entry Point is activated by the reader at **Start C**, **then** processing shall continue at Step 3.
Step 1	
3.3.2.2	Entry Point shall send a SELECT (PPSE) command (as described in *[EMV 4.3 Book 1]*, section 11.3.2) to the card, with a file name of '2PAY.SYS.DDF01'.
3.3.2.3	**If** Entry Point receives SW1 SW2 = '9000' in response to the SELECT (PPSE) command, **then**: - If **either** of the following is true: - the Terminal Category (POI Information ID '0001') of the terminal is on the Terminal Categories Supported List (tag '9F3E') returned in the FCI - **or** the SDOL (tag '9F3F') is returned in the FCI, **then** Entry Point shall proceed to Step 1a. **Otherwise,** Entry Point shall proceed to Step 2. **Otherwise**, Entry Point shall add no Combinations to the Candidate List and shall proceed to Step 3.

Requirements – Combination Selection	
Step 1a	
3.3.2.3a	Entry Point shall send the SPI command to the card. The SPI command is defined in Annex C.1.
3.3.2.3b	**If** Entry Point receives SW1 SW2 = '9000' in response to the SPI command, **then** Entry Point shall proceed to Step 2 and shall use the FCI returned in the SPI response to perform application selection. **Otherwise**, Entry Point shall add no Combinations to the Candidate List and shall proceed to Step 3.
Step 2	
3.3.2.4	**If** there is no Directory Entry (Tag '61') in the FCI, **then** Entry Point shall add no Combinations to the Candidate List and shall proceed to Step 3.
3.3.2.5	**For each** reader Combination {AID – Kernel ID} supported by the reader for which the 'Contactless Application Not Allowed' indicator is 0, Entry Point shall process **each** Directory Entry (Tag '61') from the FCI. When the Directory Entries have been processed for all supported reader Combinations, Entry Point shall proceed to Step 3. To process the Directory Entries, Entry Point shall begin with the first Directory Entry of the FCI and process sequentially for each Directory Entry in the FCI as described in bullet A thru E below. A. Entry Point shall examine the format of the ADF Name of the Directory Entry. **If** the ADF Name is missing **or** is not coded according to *[EMV 4.3 Book 1]*, section 12.2.1, **then** Entry Point shall proceed with the next Directory Entry.

Requirements – Combination Selection

B. Entry Point shall examine whether the ADF Name matches the AID of the reader Combination.

If the ADF Name has the same length and value as the AID (full match),
or the ADF Name begins with the AID (partial match),
then the ADF Name matches the AID and the AID is referred to as the "matching AID".

Otherwise Entry Point shall return to bullet A and proceed with the next Directory Entry.

C. Entry Point shall examine the presence and format of the Kernel Identifier (Tag '9F2A') to determine the Requested Kernel ID.

If the Kernel Identifier (Tag '9F2A') is absent in the Directory Entry or the Kernel Identifier is the value '00',
then Entry Point shall use a default value for the Requested Kernel ID, based on the matching AID, as indicated in Table 3-6.

Table 3-6: Default Value for Requested Kernel ID

Matching AID	Default Value for Requested Kernel ID
American Express AID	00000100b
Discover AID	00000110b
JCB AID	00000101b
MasterCard AID	00000010b
UnionPay AID	00000111b
Visa AID	00000011b
Other	00000000b

Requirements – Combination Selection

If the Kernel Identifier (Tag '9F2A') is present in the Directory Entry,
then Entry Point shall examine the value field as follows:

- **If** the length of the Kernel Identifier value field is zero,
  then Entry Point shall use a default value for the Requested Kernel ID, based on the matching AID, as indicated in Table 3-6.
- **If** byte 1, b8 and b7 of the Kernel Identifier have the value 00b or 01b[12],
  then Requested Kernel ID is equal to the value of byte 1 of the Kernel Identifier (i.e. b8b7||Short Kernel ID).
- **If** byte 1, b8 and b7 of the Kernel Identifier have the value 10b or 11b,
  then:
  - **If** the length of the Kernel Identifier value field is less than 3 bytes,
    then Entry Point shall return to bullet A and proceed with the next Directory Entry.
  - **If** the Short Kernel ID is different from 000000b,
    then the Requested Kernel ID is equal to value of the byte 1 to byte 3 of the Kernel Identifier
    (i.e. b8b7||Short Kernel ID||Extended Kernel ID).
  - **If** the Short Kernel ID is equal to 000000b,
    then the determination of the Requested Kernel ID is out of scope of this specification.

[12] The value of 01b is RFU for cards.

Requirements – Combination Selection

D. Entry Point shall examine whether the Requested Kernel ID is supported for the reader Combination.
   - **If** the value of the Requested Kernel ID is zero,
     then the kernel requested by the card is supported by the reader;
   - **If** the value of the Requested Kernel ID is non-zero
     and the value of the Requested Kernel ID is equal to the value of the Kernel ID,
     then the kernel requested by the card is supported by the reader;
   - **Otherwise** Entry Point shall return to bullet A and proceed with the next Directory Entry.

E. Entry Point shall add a Combination to the Candidate List for final selection, consisting of:
   - the ADF Name
   - the AID
   - the Kernel ID
   - the Application Priority Indicator (if present)
   - the Extended Selection (if present)

Start C

Step 3

3.3.2.6 **If** the Candidate List contains at least one entry,
then Entry Point shall retain the Candidate List[13] and shall continue with Final Combination Selection, section 3.3.3.

[13] For use with Start D and Start B with issuer response data.

Requirements – Combination Selection

3.3.2.7 **If** the Candidate List is empty,
then Entry Point shall send an ***End Application*** Outcome with the following Outcome parameter values and shall continue with Outcome Processing, section 3.5.

End Application:

- **Start:** N/A
- **Online Response Data:** N/A
- **CVM:** N/A
- **UI Request on Outcome Present:** Yes
  - **Message Identifier:** '1C' ("Insert, Swipe or Try Another Card")
  - **Status:** Ready To Read
- **UI Request on Restart Present:** No
- **Data Record Present:** No
- **Discretionary Data Present:** No
- **Alternate Interface Preference:** N/A
- **Receipt:** N/A
- **Field Off Request:** N/A
- **Removal Timeout:** Zero

3.3.3 Final Combination Selection

Once Entry Point determines the list of mutually supported Combinations, it shall proceed as follows:

Requirements – Final Combination Selection

3.3.3.1 **If** there is only one Combination in the Candidate List,
then Entry Point shall select the Combination.

Requirements – Final Combination Selection

3.3.3.2 **If** there are multiple Combinations in the Candidate List,
then Entry Point shall select the Combination as follows:

- Consider each Combination that has an Application Priority Indicator with a value of 0 or no Application Priority Indicator to be of equal lowest priority.
- **If** a single Combination has a higher priority than any other Combination in the Candidate List,
then select that Combination.
- **Otherwise** multiple Combinations in the Candidate List have the highest priority, and Entry Point shall select a Combination as follows:

  Determine[14] the order of these Combinations' ADF Names and Kernel IDs in the PPSE, where the order is the position in the PPSE, with the lowest order being the first.

  Select any one of the Combinations that have the lowest order.

3.3.3.3 **If** all of the following are true:

- the Extended Selection data element (Tag '9F29') is present in the Combination selected,
- **and** the Extended Selection Support flag is present for this Combination,
- **and** the Extended Selection Support flag is 1,

then Entry Point shall append the value contained in Extended Selection to the ADF Name in the data field of the SELECT command.

3.3.3.4 Entry Point shall send the SELECT (AID) command with the ADF Name of the selected Combination (with Extended Selection if appended).

[14] Unless track of the position of the PPSE entry leading to the addition of each Combination in the Candidate List was kept (while processing Requirement 3.3.2.5), it will be necessary to reprocess Requirement 3.3.2.5 for each of these combinations, instead of the complete list of reader Combinations, to determine which one corresponds to the earliest entry in the PPSE.

The response to the SELECT (AID) command is structured as defined in *[EMV 4.3 Book 1]*, Table 45, and is received and processed by Entry Point, including the Status Word SW1 SW2.

Requirements – Final Combination Selection

3.3.3.5 **If** the response to the SELECT (AID) command includes an SW1 SW2 other than '9000',
then:

- **If** Issuer Authentication Data and/or Issuer Script data is present,
  then Entry Point shall send an **End Application** Outcome with the following Outcome parameter values and shall continue with Outcome Processing, section 3.5**.**

  End Application:

  - **Start:** N/A
  - **Online Response Data:** N/A
  - **CVM:** N/A
  - **UI Request on Outcome Present:** Yes
    - **Message Identifier:** '1C' (“Insert, Swipe or Try Another Card”)
    - **Status:** Ready To Read
  - **UI Request on Restart Present:** No
  - **Data Record Present:** No
  - **Discretionary Data Present:** No
  - **Alternate Interface Preference:** N/A
  - **Receipt:** N/A
  - **Field Off Request:** N/A
  - **Removal Timeout:** Zero
- **Otherwise** Entry Point shall remove the selected Combination from the Candidate List and shall return to Start C (Step 3 of Combination Selection (requirement 3.3.2.6)).

3.3.3.6 **If** all of the following are true:

- the selected AID indicates Visa AID,
- **and** the kernel in the selected Combination is Kernel 3,
- **and** the PDOL in the FCI is absent
  or the PDOL in the FCI does not include Tag '9F66',

then Entry Point shall remove the selected Combination from the Candidate List and shall return to **Start C** (Step 3 of Combination Selection (requirement 3.3.2.6)).

Requirements – Communication Errors

3.3.3.7 **If** at any time during Protocol Activation or Combination Selection a communications error as defined in *[EMV L1 Contactless]* (Transmission, Protocol, or Time-out) is reported to Entry Point, **then** Entry Point shall return to **Start B** (Protocol Activation, section 3.2.1).

Requirements – Application Selection Registered Proprietary Data

3.3.3.8 Application Selection Registered Proprietary Data (ASRPD) may be present in the FCI Issuer Directory Discretionary data (tag 'BF0C') within the FCI. Usage of the ASRPD received from the ICC is optional and proprietary.

If Entry Point does not use ASRPD,
then Entry Point shall ignore '9F0A' in the FCI Issuer Directory Discretionary data (tag 'BF0C') and continue processing as if the data was not present.

If Entry Point uses ASRPD,

then Entry Point interprets the value field to recover all the Proprietary Data Identifiers as in Requirement 3.3.1.2. Note that different values for the same Proprietary Data Identifier may be present in the different instances of the ASRPD recovered by Entry Point/kernel, even if these instances are linked to the same ADF. For example, an instance of the Proprietary Data Identifier in the Directory Entry for an ADF in the PPSE and another instance of the same Proprietary Data Identifier in the FCI Issuer Discretionary Data within the FCI of the same ADF.

3.4 Kernel Activation – *Start D*

Kernel Activation is either the next step after Combination Selection, or Entry Point may be started at Kernel Activation as **Start D** after Outcome Processing. In the event that Entry Point is started as **Start D**, the FCI and the Status Word will not be needed for the selected kernel.

During Kernel Activation, Entry Point hands over control to the kernel of the selected Combination. Once the kernel is activated, all commands and responses are processed by the kernel.

Requirements – Kernel Activation	
3.4.1.1	Entry Point shall activate the kernel identified in the selected Combination.
3.4.1.2	Entry Point shall make the Entry Point Pre-Processing Indicators (as specified in Book A, Table 5-3) for the selected Combination available to the selected kernel.
3.4.1.3	Entry Point shall make available the FCI and the Status Word SW1 SW2 (both received from the card in the SELECT (AID) response) to the selected kernel. This requirement does not apply if Entry Point is restarted at **Start D** after Outcome Processing.

3.5 Outcome Processing

Each kernel finishes its processing by providing an Outcome with parameters. Some Outcomes, such as ***Try Again*** and ***Select Next*** are processed immediately by Entry Point which re-starts processing at the appropriate start. The rest, such as ***Approved, Online Request*** and ***Request Online PIN*** are passed to the reader as a Final Outcome together with the parameters and associated data.

In addition, for exception conditions within Entry Point processing, a Final Outcome may be provided directly by Entry Point.

Full details of the Outcomes and parameter settings can be found in Book A, Chapter 6.

Requirements – Outcomes	
3.5.1.1	**If** the value of Outcome parameter UI Request on Outcome Present is 'Yes', **then** Entry Point shall send the associated User Interface Request.
3.5.1.2	**If** the Outcome parameter Field Off Request has a value other than 'N/A', **then** the field shall be turned off and shall remain off for the period indicated by the hold time.

Requirements – Outcome – *Try Again*	
3.5.1.3	**If** the Outcome is ***Try Again***, **then** Entry Point shall return to **Start B** (Protocol Activation, section 3.2.1).

Requirements – Outcome – *Select Next*	
3.5.1.4	**If** the Outcome is ***Select Next***, **then** Entry Point shall remove the selected Combination from the Candidate List and shall return to **Start C** (Step 3 of Combination Selection (requirement 3.3.2.6)).

Requirements – Outcome – Other

3.5.1.5 **If** the Outcome is other than ***Try Again*** or ***Select Next***,
then Entry Point shall provide the Outcome to the reader as a Final Outcome, together with:

- the Outcome parameter set
- associated data provided by the kernel
- the ADF Name of the application that was selected (with Extended Selection if appended)

3.6 Data Element Processing

3.6.1 Presence of Data

Requirements – Presence of Data	
3.6.1.1	**If** Entry Point encounters a data object from the card that is designated as terminal or reader sourced, **then** it shall ignore the data object and continue the transaction as if the data object had not been present.
3.6.1.2	**If** Entry Point encounters a data object from the card that is not recognised, **then** the unrecognised data object shall be ignored and the transaction shall continue as if the data object had not been present.

3.6.2 Rules for Padding

Requirements – Padding	
3.6.2.1	The reader shall apply padding according to the format of the data elements and the rules as defined in *[EMV 4.3 Book 1]*, Annex B and Specification Bulletin 69.

3.6.3 Order of Data Elements

Requirements – Order of Data Elements	
3.6.3.1	The reader shall accept TLV data elements in any order.

Annex A Data Elements Dictionary

Table A-1 defines those data elements that are introduced by Entry Point and which may be used for financial transaction interchange and their mapping onto data. For other data elements referenced in this specification, see *[EMV 4.3 Book 3]*, Annex A. *[EMV 4.3 Book 3]* also defines the rules for handling the data elements.

The characters used in the “Format” column are described in Book A, section 3.2.

Table A-1: Data Elements Dictionary

Name	Description	Source	Format	Template	Tag	Length
Application Selection Registered Proprietary Data (ASRPD)	Proprietary data allowing for proprietary processing during application selection. Proprietary data is identified using Proprietary Data Identifiers that are managed by EMVCo and their usage by the Entry Point is according to their intended usage, as agreed by EMVCo during registration.	Card	b, see also requirement 3.3.1.2 3.3.3.8	‘61’ or ‘BF0C’	‘9F0A’	var
Extended Selection	The value to be appended to the ADF Name in the data field of the SELECT command, if the Extended Selection Support flag is present and set to 1. Content is payment system proprietary. Note: The maximum length of Extended Selection depends on the length of ADF Name in the same directory entry such that Length of Extended Selection + Length of ADF Name <= 16.	Card	b	'61'	'9F29'	var
Kernel Identifier	Indicates the card’s preference for the kernel on which the contactless application can be processed.	Card	b	'61'	'9F2A'	1 or 3-8

Name	Description	Source	Format	Template	Tag	Length
POI Information	Contains information about the terminal and the acceptance environment. The value field of the POI Information data object has the following format: ID1 L1 V1 ID2 L2 V2… Where: • ID is a two-byte identifier whose context is limited to the POI Information data object. The IDs used in the POI Information data object are completely unrelated to IDs used in other data objects, such as the IDs used in the ASRPD. • L is the length of the value field coded in 1 byte (0 to 61). • V is the value field. Note that: • IDs are assigned by EMVCo and may only appear in the POI Information if they have been registered with EMVCo. • IDs have no structure. They are not tags according to BER-TLV coding. See section A.1 for the list of POI Information IDs defined by EMV and used in this specification.	Entry Point	b	—	'8B'	var. up to 64
Reader Contactless Floor Limit	Indicates the contactless floor limit relating to the Combination.	Entry Point	n 12	—	—	6

Name	Description	Source	Format	Template	Tag	Length
Reader Contactless Transaction Limit	Indicates the limit for which contactless transactions can be conducted relating to the Combination.	Entry Point	n 12	—	—	6
Reader CVM Required Limit	Indicates the limit for which a CVM is necessary relating to the Combination.	Entry Point	n 12	—	—	6
Selection Data Object List (SDOL)	Contains a list of terminal resident data objects (tags and lengths) needed by the card in processing the SEND POI INFORMATION (SPI) command. The SDOL can be used to request the following terminal data objects: • Amount, Authorised (Numeric) (tag '9F02') • POI Information (tag '8B') • Terminal Country Code (tag '9F1A') Transaction Currency Code (tag '5F2A')	Card	b	'BF0C'	'9F3F'	var.
Terminal Categories Supported List	Contains a list of one or more terminal categories supported by the card. Bytes 1-2: Terminal Category 1 Bytes 3-4: Terminal Category 2 … Plus two bytes for each additional Terminal Category The Terminal Categories supported by this specification are defined in Table A-2, Terminal Category (POI Information ID '0001').	Card	b	'BF0C'	'9F3E'	var.

Name	Description	Source	Format	Template	Tag	Length
Terminal Transaction Qualifiers	Indicates the requirements for online and CVM processing as a result of Entry Point processing. The scope of this tag is limited to Entry Point. Kernels may use this tag for different purposes.	Entry Point	b		'9F66'	4

A.1 EMV Defined POI Information Identifiers

This section lists the EMV defined IDs for the POI Information data object. This section does not include any IDs registered with EMVCo but whose contents are not defined by EMV.

Table A-2: EMV Defined POI Information Identifiers (IDs)

ID	Name	Description	Format	Length
'0001'	Terminal Category	Indicates the terminal category to which the terminal belongs. For terminals that do not belong to a terminal category listed below, the Terminal Category ID L V is not present in the POI Information data object. '00 01' = Transit gate; the terminal at the entrance or exit to a transit network (e.g., a metro gate) or vehicle (e.g., a bus) that is used to accept cards for transit network access. This category does *not* include terminals present in transit acceptance environments but that do not control access to the transit network (e.g., unattended ticketing kiosks). '00 02' = Loyalty; the terminal facilitates a loyalty program using POI Information. All other values are RFU for this specification.	b	2

Annex B Glossary

This annex provides a glossary of terms and abbreviations used in Book A and Book B of the *EMV Contactless Specifications for Payment Systems*.

ADF	Application Definition File
AID	Application Identifier
Approved	A Final Outcome
ASRPD	Application Selection Registered Proprietary Data
b	Binary
Business Agreement	An agreement reached between a payment system and its business partner(s).
C	Conditional
C-APDU	Command APDU
Candidate List	The list of Combinations constructed by Entry Point during the Combination Selection process.
Card	As used in these specifications, a consumer device supporting contactless transactions.
Cardholder Verification Method (CVM)	A method used to confirm the identity of a cardholder.

Combination

Any of the following:

For:	The combination of:
a card	• an ADF Name • a Kernel Identifier
a reader	• an AID • a Kernel ID
the Candidate List for final selection	• an ADF Name • a Kernel ID • the Application Priority Indicator (if present) • the Extended Selection (if present)

Confirmation Code

A code or password entered into a mobile device in order to confirm that a user wishes to perform a contactless mobile payment transaction.

Contactless card

See “Card”.

Contactless Symbol

The symbol identifying the contactless “landing plane” near the antenna of a contactless acceptance device, where the cardholder must present the card.

CVM

Cardholder Verification Method

DDF

Directory Definition File

Declined

A Final Outcome

DF

Dedicated File

Discovery

Contactless readers poll for contactless cards. When one or more contactless cards enter the field of the contactless reader, this is called discovery.

DOL

Data Object List

EMV®

EMV® is a trademark dating back to 1999, and it refers to all of the specifications administered by EMVCo

EMV mode	An operating mode of the POS System that indicates that this particular acceptance environment and acceptance rules supports chip infrastructure. Typically used in conjunction with the term “transaction” (i.e., EMV mode transaction) to indicate contactless payment utilising a full chip infrastructure carrying EMV minimum data.
EMVCo	EMVCo, LLC is the organization that manages, maintains and enhances the EMV Specifications.
End Application	A Final Outcome
Extended Selection	An option in which Entry Point appends the value indicated by the Extended Selection data element (Tag '9F29') to the ADF name in the SELECT command.
FCI	File Control Information
Final Outcome	Result provided to the reader as a result of Entry Point processing the Outcome from the kernel, or provided directly by Entry Point under exception conditions.
Hz	Hertz
Kernel	The kernel contains interface routines, security and control functions, and logic to manage a set of commands and responses to retrieve the necessary data from a card to complete a transaction. The kernel processing covers the interaction with the card between the Final Combination Selection (excluded) and the Outcome Processing (excluded).
Kernel ID	Identifier to distinguish between different kernels that may be supported by the reader.
Kernel Identifier	Identifier to distinguish between different kernels that may be indicated by the card.
LED	Light-Emitting Diode
M	Mandatory

Mag-stripe mode	An operating mode of the POS System that indicates that this particular acceptance environment and acceptance rules supports mag-stripe infrastructure. Typically used in conjunction with the term “transaction” (i.e., mag-stripe mode transaction) to indicate contactless payment based on Track 1 and/or Track 2 Data obtained from the card.
ms	Millisecond
n	Numeric
N/A	Not Applicable; a possible value for several Outcome and Final Outcome parameters
O	Optional
Online PIN	A method of PIN verification where the PIN entered by the cardholder into the terminal PIN pad is encrypted and included in the online authorisation request message sent to the issuer.
Online Request	A Final Outcome
Outcome	Result from the kernel processing, provided to Entry Point, or under exception conditions, result of Entry Point processing. In either case, a primary value with a parameter set.
PDOL	Processing Options Data Object List
PIN	Personal Identification Number
POS	Point of Sale
PPSE	Proximity Payment System Environment
Proximity Payment System Environment (PPSE)	A list of all Combinations supported by the contactless card. PPSE is used in the Entry Point Combination Selection process.
R-APDU	Response APDU
Reader	A component of the POS System; for details, please see Book A, section 4.3.
Requested Kernel ID	Internal Entry Point variable used to build the matching kernel identification during the Combination Selection process

Restart flag	Internal reader flag that indicates whether a kernel is being started for a new transaction or continuing with an ongoing transaction (e.g. in order to complete online processing, to perform on-device CVM, to recover from a communication error, etc.).
RFU	Reserved for Future Use (by EMVCo)
Select Next	An Outcome
Status Check Support	Option within the terminal related to the checking of a single unit of currency. A single unit of currency has the value of 1 of the (major) unit of currency as defined in *[ISO 4217]*. As an example a single unit of currency for Euro is 1.00.
SW1 SW2	Status Byte One, Status Byte Two
Terminal	A component of the POS System; for details, please see Book A, section 4.3.
TLV	Tag Length Value
Transaction	The reader-card interaction between the first presentment of the card and the decision on whether the transaction is approved or declined. If the transaction is authorised online, this may involve multiple presentments of the card on the reader.
Try Again	An Outcome
Try Another Interface	A Final Outcome
TTQ	Terminal Transaction Qualifiers
UI	User Interface
var	Variable length

Annex C Commands

This annex lists the new command(s) that are added by this specification.

C.1 SEND POI INFORMATION (SPI) Command-Response APDUs

C.1.1 Definition and Scope

The SPI command sends information about the terminal to the card during the application selection process. Cards may use this terminal information to change the list of applications they return to the terminal, as some applications may be more or less appropriate depending on the terminal to which the card is being presented.

Cards indicate support for this functionality by returning either or both the Terminal Categories Supported List (tag '9F3E') and SDOL (tag '9F3F') data objects in the FCI of the SELECT of the PPSE.

The response from the card consists of returning an FCI.

C.1.2 Command Message

The SPI command message is coded according to Table C-1:

Table C-1: SPI Command Message

Code	Value
CLA	'80'
INS	'1A'
P1	'00'; all other values are RFU
P2	'00'; all other values are RFU
Lc	Number of data bytes
Data	Command template See section C.1.3 for details
Le	'00'

C.1.3 Data Field Sent in the Command Message

The data field of the command message is the command template tag ('83') and length, followed by the following data:

- If the SDOL is provided by the card, data object values according to the SDOL provided by the card. DOL coding is as defined in *[EMV 4.3 Book 3]* Section 5.4.
- If the Terminal Category (POI Information ID '0001') of the terminal is on the Terminal Categories Supported List (tag '9F3E') returned by the card in the FCI of the SELECT (PPSE) response, then the ID, length, and value of the following data objects in the POI Information are returned:
  - (Required) the Terminal Category of the terminal (ID '0001')
  - (Optional) any other IDs in the POI Information. In this version of the specification, EMV does not define any additional POI Information IDs returned to supplement the current terminal categories. However, proprietary programs may choose to include supplemental information for specific terminal categories.

Figure C-1 illustrates the SPI command message data field. Solid lines indicate the data is always included in the data field and dashed lines indicate the data is conditionally or optionally included in the data field, as defined above.

Figure C-1: SPI Command Message Data Field

<table>
<tr><td rowspan="2">'83'</td><td rowspan="2">Length</td><td rowspan="2">SDOL requested data object values</td><td>Terminal Category</td><td>Additional POI Information data objects</td></tr>
<tr><td>'0001 02 xxxx'</td><td>ID_1 L_1 V_1 … ID_n L_n V_n</td></tr>
</table>

C.1.4 Data Field Retuned in the Response Message

The data field of the response message contains the FCI as shown in Table 3-2, except that the Terminal Categories Supported List (tag '9F3E') and SDOL (tag '9F3F') data objects are not included. Terminals shall ignore these two data objects if they are included in the FCI of the SPI response message.

The applications listed in the FCI may be the same as the applications previously returned in the FCI of the SELECT of the PPSE, or may be different applications based on the terminal information received by the card in the SPI command.

C.1.5 Processing State Returned in the Response Message

'9000' indicates a successful execution of the command.

***** END OF DOCUMENT *****