Discover® Contact D-PAS:
Discover® Quick Chip Implementation Guide

DISCOVER® FINANCIAL SERVICES

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This **Discover® Contact D-PAS: Discover® Quick Chip Implementation Guide** (this "Guide") provides implementation guidance to assist Acquirers, Merchants, Issuers and approved network participants with support for Discover® Quick Chip and is subject to change by Discover at any time without notice to any party. Neither this Guide nor any other document or communication creates any binding obligation upon any of the Discover Parties, Acquirers, Merchants, Issuer or any other approved network participant. If Acquirer, Merchant or third party seeks to support Discover Quick Chip, this Guide identifies Discover's requirements with respect to Chip Card Terminal testing and certification services.

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1.0	Release	July 12, 2016	First Release

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1 Introduction

This Guide describes the modified D-PAS deployment procedures that are required to implement Discover Quick Chip.

The objective of Discover Quick Chip is to offer Merchants increased flexibility in connection with EMV implementation that may help Merchants streamline Chip Card transaction processing on Chip Card Terminals.

This Guide does not replace any Discover Program Documents, DCI International Operations Manual [DCI IOM], PULSE Operating Rules and Procedure [PULSE ORP] or the documents referenced therein. Where applicable, Acquirers, Merchants, Issuers and approved network participants should refer to the reference documents and other documentation and specifications provided by DFS and listed in Section1.4 of this Guide. It is assumed that the intended audience is familiar with these documents.

1.1 Audience

This Guide is primarily for Acquirers that support Discover Quick Chip, and provides information for Issuers regarding the processing of Discover Quick Chip Transactions.

This Guide may also be used by Acquirer Processors, Merchant Processors, third party processors, and/or other entities responsible for implementing components and services required to support Discover Quick Chip.

For the purposes of this Guide, a Merchant is treated the same as an Acquirer, unless otherwise indicated.

1.2 Scope of the Guide

This Guide highlights the Chip Card Terminal and processing requirements to support Discover Quick Chip, and to describe the impacts on Issuers and other third parties.

1.3 Organization of this Guide

This Guide is divided into the following sections:

- Section 2: Overview of Discover Quick Chip – provides an overview of how Discover Quick Chip processing works and how it compares with standard EMV processing.
- Section 3: Discover Quick Chip Transaction Processing – describes the steps in a Discover Quick Chip Transaction and specific implementation requirements for enabling Discover Quick Chip Transactions.
- Section 4: Acquirer and Merchant Certification Requirements – outlines the certification requirements for new EMV deployments, and those previously D-PAS certified.
- Section 5: Issuer Considerations – provides guidance for Issuers to correctly process Discover Quick Chip Transactions.

1.4 Reference Materials

The documents listed in the following table are referenced in this Guide using the abbreviations provided. Before using any of these documents, please check for any updates with your DFS representative.

Table 1 – Reference Documents

Document Type	Title	Source	Reference
D-PAS Documents	Discover Contact D-PAS: Acquirer Implementation Guide	1	[DFS CT D-PAS: AIG]
	Discover Contact D-PAS: Certification Guide for Issuers and Acquirers	1	[DFS CT D-PAS: CG]
Specifications	Discover Contact D-PAS: Terminal Application Specification	1	[CT D-PAS: TS]
Operating Regulations	Discover Acquirer Operating Regulations	1	[DN AOR]
	DCI International Operations Manual	1	[DCI IOM]
	PULSE Operating Rules and Procedure	1	[PULSE ORP]
Agreement	Agreement with Discover Party governing Card Acceptance (the Acquirer Agreement or Acquirer Processor Agreement, as applicable)	1	[AGR]
EMVCo Documents	EMV. Integrated Circuit Card Specifications for Payment Systems, version 4.2. June 2011	2	[EMV 4.2]

Key:

1 = Available from your Implementation Manager.

2 = Available from the EMVCo website: http://www.emvco.com

In the event of a conflict between this Guide and:

- the Agreement, the Agreement shall govern;
- the Operating Regulations generally with respect to Card Issuance or Card Acceptance, the Operating Regulations shall govern;
- the D-PAS Application Specification with respect to Discover Quick Chip, this Guide shall govern;
- the D-PAS Certification Guide with respect to testing and certification of Chip Card Terminal support for Discover® Quick Chip, the D-PAS Certification Guide will govern.

2 Overview of Discover Quick Chip

As used in this Guide, "Discover Quick Chip" means the Chip Card Terminal implementation option offered by Discover that uses the modified EMV Transaction flow described below.

Discover Quick Chip reduces the time that a Chip Card is in a Chip Card Terminal by allowing:

- the Chip Card Transaction to start before the Card transaction amount is final; and
- the Chip Card to be removed from the Chip Card Terminal before receipt of the Authorization Response.

Discover Quick Chip modifies the EMV Transaction flow by enabling certain Transaction processes to complete after a Chip Card is removed from a Chip Card Terminal. However, it does not change other standard EMV processes such as Card personalization.

Discover Quick Chip may be implemented for use at any Chip Card Terminal, but is particularly relevant in environments such as multi-lane retail and quick service restaurants.

2.1 Discover Quick Chip versus Standard EMV Transaction Processing

Discover Quick Chip performs all standard EMV Transaction processes, except post-Authorization Card processing.

The primary differences between Discover Quick Chip and standard EMV processing are:

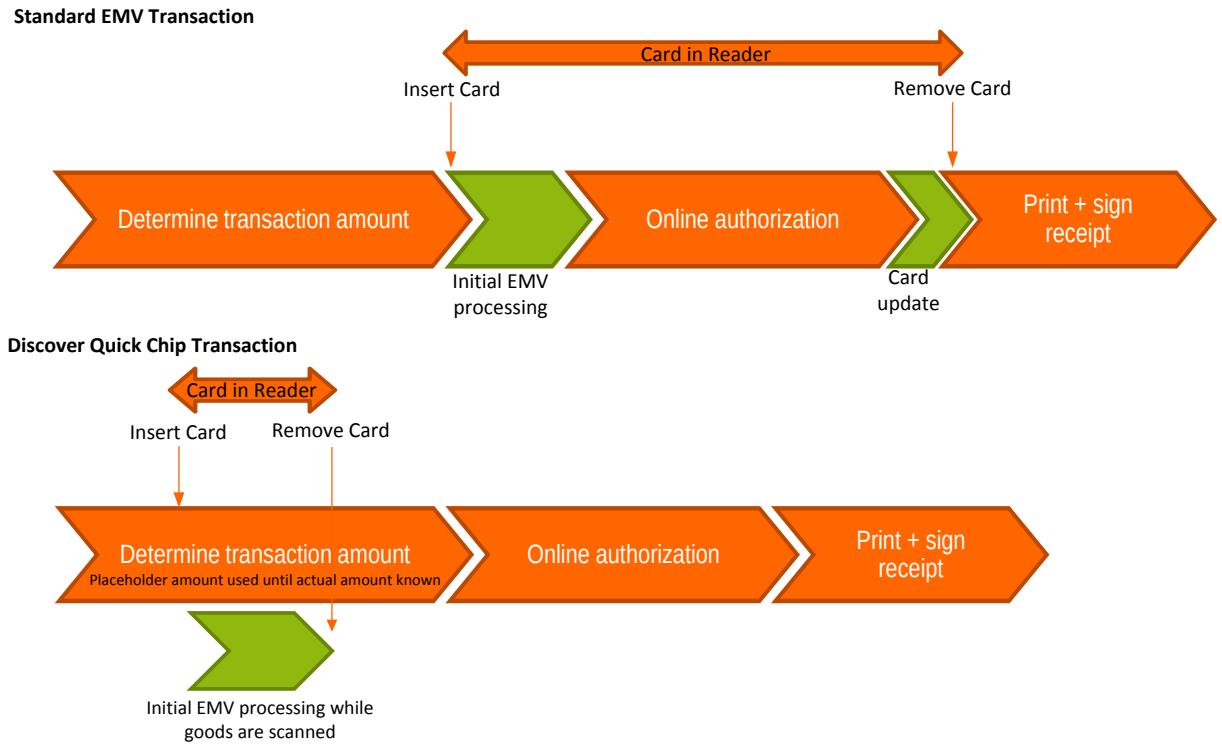
- **Confirmation of final Card Transaction amount:** With Discover Quick Chip, the Chip Card Terminal is not required to wait for confirmation of the final Transaction amount before completing Cardholder Verification Method (CVM) processing and requesting data for the online Authorization from the Chip Card. Instead, a placeholder amount can be used until the actual amount is known.

  Where a placeholder amount is used, all offline CRM processes that use Transaction amounts, such as profile and CVM selection, are based on the placeholder amount and not the final Transaction amount.
- **Authorization Response:** The Chip Card is not required to remain in the Chip Card Terminal until the Authorization Response is received from the Issuer.

2.2 Discover Quick Chip Transaction Processing Flow

The following Figure shows a comparison between a standard EMV Transaction and a Discover Quick Chip Transaction, where Signature is the chosen CVM.

Figure 1 – Comparison of Standard EMV and Typical Discover Quick Chip Transactions (Signature)



In a standard EMV Transaction, the final Chip Card Transaction amount is provided to the Chip Card in order to provide authentication data to the Chip Card Terminal. The Transaction is then processed, Online Authorization and Card update take place, and a receipt is issued (and signed, if Signature is the preferred CVM).

In a Discover Quick Chip Transaction, the Chip Card may be inserted into the Chip Card Terminal and the initial EMV processing carried out at any point while the goods are being scanned. Once the initial EMV processing is complete and the Card produces a cryptogram for online Authorization, the Chip Card can be removed from the Chip Card Terminal. Card removal may therefore occur before the final Transaction amount is known.

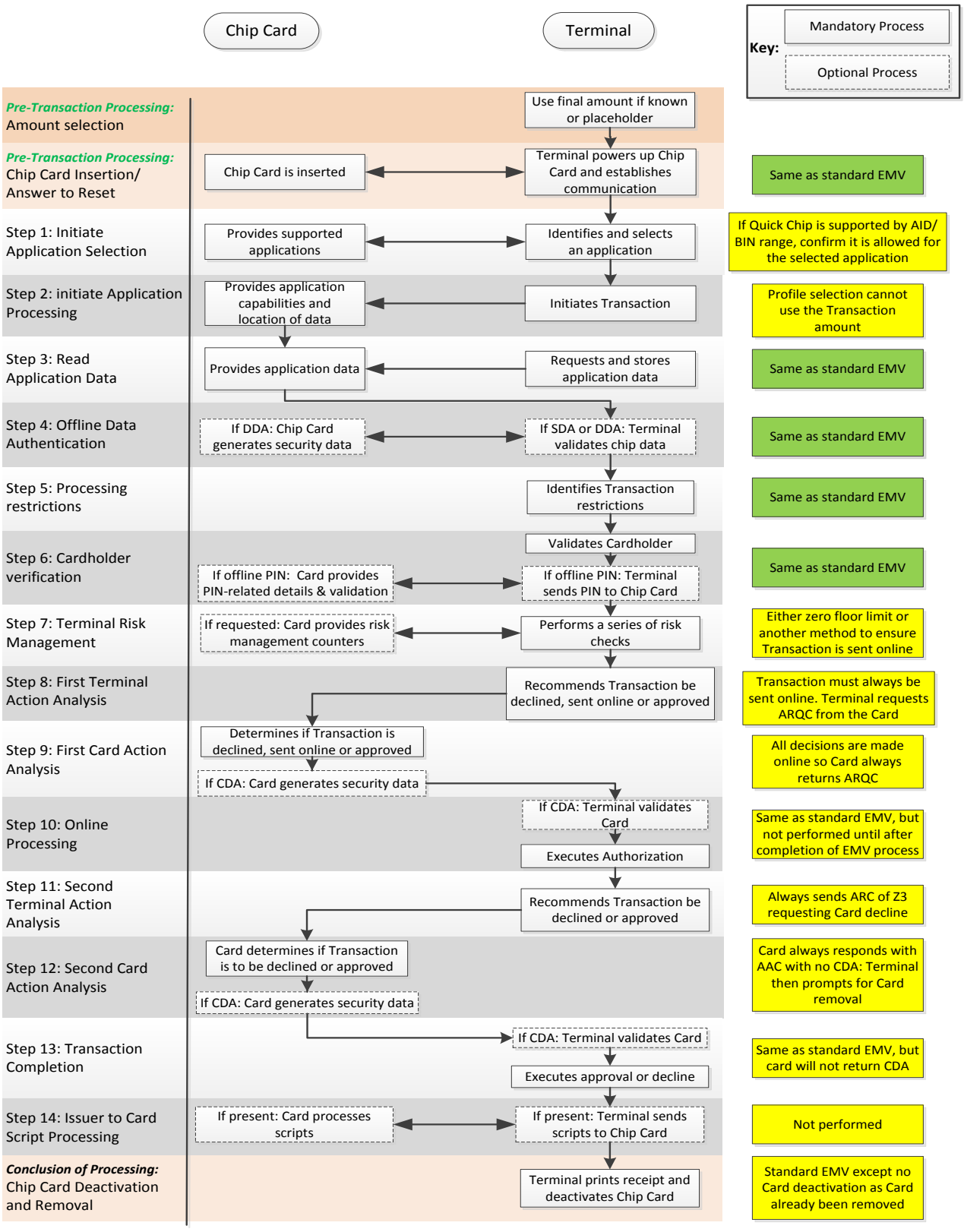
For Discover Quick Chip Transactions there are:

- No Card updates
- No final cryptogram
- No possibility of offline approval if online Authorization not possible
- No support at ATMs.

In addition, all offline CRM processes that use Transaction amounts are based on the placeholder Chip Card Transaction amount, not the final Transaction amount.

The following diagram shows the detailed steps for a standard EMV Transaction. The right hand column indicates the functions that are performed differently by Chip Card Terminals that support Discover Quick Chip.

Figure 2 – Standard EMV versus Discover Quick Chip Transaction Processing Flow



2.3 Other Features of Discover Quick Chip Transactions

2.3.1 Online Authorization

Discover Quick Chip Transactions are authorized online. If the Issuer does not approve the Transaction, or if no response to the Authorization Request is received, the Terminal declines the Transaction.

2.3.2 Support for Discover Quick Chip by AID

Chip Card Terminals may be configured to support Discover Quick Chip by Application Identifier (AID) to avoid interoperability issues when a Chip Card is presented that does not work with a Quick Chip Terminal.

2.3.3 Cash Over Transactions

Discover Quick Chip may be used for cash over ('cash back') Transactions, subject to the standard rules in the Agreement [AGR] and Operating Regulations governing these Transactions, and provided such functionality is supported by the Card settings.

3 Discover Quick Chip Transaction Processing

This section describes the steps in a Discover Quick Chip Transaction.

3.1 Transaction Amount Selection

Before beginning a Discover Quick Chip Transaction, the Terminal determines whether to use the final Transaction amount or a placeholder.

- If the actual Transaction amount is known at the time the Card is inserted in the Terminal, the Discover Quick Chip Transaction is completed using this amount.
- If the actual Transaction amount is not known, a placeholder amount is used.

The placeholder amount is used to generate a cryptogram and is also included in Field 55, Tag 9F02 (Amount, Authorized). The placeholder amount should be greater than the Terminal floor limit to ensure that all Discover Quick Chip Transactions are sent online for Authorization, unless a certified proprietary method is used to provide online authorization.

3.2 Initiate Application Selection

DFS recommends that Chip Card Terminals support Discover Quick Chip by AID, with the Terminal default settings indicating that Discover Quick Chip is not supported.

Before starting a Transaction, the Chip Card Terminal must perform the following steps:

1. Determine which AIDs are supported by both the Card and the Chip Card Terminal.
2. Select the application to be used in the same way as standard EMV, including processing of the U.S. Common Debit AID if present and applicable.

   Application Selection may be performed using either the directory or the “List of AIDs” method, although the Directory method is recommended to add additional processing efficiency if supported by the Card.
3. Confirm that Discover Quick Chip is allowed for the selected AID.

   If Discover Quick Chip is not allowed, the Transaction must be restarted using the standard EMV Transaction flow once the final Transaction amount is known. During the Transaction restart, the Chip Card Terminal should not prompt the user to remove the Card.

3.3 Read Application Data

This step is performed in the same way as standard EMV Transactions.

3.4 Offline Data Authentication

This step is performed in the same way as standard EMV Transactions.

3.5 Processing Restrictions

This step is performed in the same way as standard EMV Transactions.

3.6 Cardholder Verification

Discover Quick Chip may use any of the following CVMs that are available for use in standard EMV Transactions:

- Online PIN
- Offline PIN
- Signature
- No CVM

CVMs are processed as follows:

- If PIN is the chosen CVM but the final Transaction amount is not yet known, the PIN entry device must not display a Transaction amount.
    - If Offline PIN is the chosen CVM, the Cardholder is informed of the result by the PIN entry device.
    - If Online PIN is the chosen CVM, the PIN entered is encrypted into a PIN Block for inclusion in the Authorization Request, in accordance with the Payment Card Industry PCI PED requirements.
- If Signature is the chosen CVM, the Transaction amount must not be printed or displayed by the Chip Card Terminal until the Authorization Response is received.

Note: If the CVM list includes rules based on Transaction amount and a placeholder amount is used, CVM selection is based on the placeholder amount, not the final Transaction amount.

3.7 Terminal Risk Management

This step is performed in the same way as standard EMV Transactions.

The Terminal floor limit should be set to zero to ensure that online Authorization is performed for the Chip Card Transaction. If the Terminal floor limit is set to an amount other than zero (for example, the Acquirer or Merchant has implemented non-zero floor limits for non-Discover Quick Chip EMV Transactions), the Terminal may use a certified proprietary method to ensure that online Authorization is performed for the Quick Chip Transaction.

3.8 First Terminal Action Analysis

This step is performed in the same way as standard EMV Transactions.

The result should always be that the Terminal requests an Authorization Request Cryptogram (ARQC) from the Card.

The Transaction amount that is sent to the Card in the GENERATE AC command is either the final Transaction amount or the placeholder amount (see Section 3.1).

3.9 First Card Action Analysis

This step is performed in the same way as standard EMV Transactions.

The Chip Card may return an ARQC or an Application Authentication Cryptogram (AAC).

The next step depends on the result of the First Card Action Analysis:

- If the Chip Card returns an AAC, the Chip Card Terminal must decline the Chip Card Transaction and prompt the Cardholder to remove the Card.
- If the Card returns an ARQC, the Terminal stores the ARQC and associated data in preparation for creating an online Authorization Request, and proceeds to the Second Terminal Action Analysis step.

3.10 Second Terminal Action Analysis

Unlike a standard EMV Transaction, a Chip Card Terminal that supports Discover Quick Chip performs the second Terminal and Card Action Analysis steps before requesting online Authorization.

In the Second Terminal Action Analysis step, the Chip Card Terminal terminates the Discover Quick Chip Transaction so that the Chip Card can be powered down and removed from the Terminal. It does this by sending an Authorization Response Code (Tag 8A) with a value of Z3 (Unable to go online/Offline Declined) to the kernel. The kernel will send a second GENERATE AC command to the Card containing an Authorization Response Code (ARC) set to Z3.

Note: The use of Z3 does not mean that the Terminal was actually unable to perform online Authorization for the Chip Card Transaction. Instead, Z3 is used to force the Chip Card to issue an AAC and terminate the Chip Card Transaction.

3.11 Second Card Action Analysis

The Card returns an AAC.

The Chip Card Terminal completes standard EMV processing and prompts for the Chip Card to be removed from the Chip Card Terminal.

3.12 Online Authorization

Online Authorization is required for all Discover Quick Chip Transactions. It is performed by the Chip Card Terminal once the final Transaction amount is known, and after the Chip Card is removed from the Terminal.

The amount that was used to generate the ARQC is sent in Field 55, Tag 9F02 (Amount, Authorized) of the Authorization Request. All other tags in Field 55, as specified in CDOL1, contain the data used to generate the cryptogram in the First Card Action Analysis step.

The final Transaction amount is sent in Field 4 (Transaction Amount) of the Authorization Request.

If online Authorization is not possible, the Chip Card Transaction must be declined. The Terminal should display the same message to the Cardholder as it would in other cases where online Authorization is not possible.

3.13 Transaction Completion

This step is performed in the same way as standard EMV Transactions.

If Signature was the chosen CVM during EMV processing, the Cardholder should be prompted to sign the receipt or use the electronic signature capture device once the Issuer Authorization has been received. The receipt can then be printed, showing the final Transaction amount.

The rules for signature verification are the same for Discover Quick Chip as for other signature-based Chip Card or magnetic stripe Card Transactions. Please refer to the relevant Agreement and Operating Regulations for details.

3.14 Issuer Authentication, Card Status Updates and Issuer Scripts

Because the Card was withdrawn from the Terminal, it is not available to process Issuer Authentication (Authorization Response Cryptogram - ARPC), Card Status Updates (CSUs) or Issuer scripts.

Issuer Authentication is not required for Discover Quick Chip Transactions, because the Transaction is approved or declined according to the Issuer's decision in the Authorization Response Message.

The Chip Card Terminal application must ignore any Issuer Authentication Data or Issuer Scripts that appear in the Authorization Response.

3.15 Chip Card Terminals with Non-Zero Floor Limit

This section describes implementation requirements for Chip Card Terminals with a non-zero floor limit.

If Discover Quick Chip is implemented at a Chip Card Terminal with a non-zero floor limit, one of the following alternatives must be applied:

- Set the Terminal floor limit to zero for all Transactions
- Set the Terminal floor limit to zero for Discover Quick Chip Transactions, if permitted by the Terminal application

- If the floor limit cannot be set to zero, ensure that the placeholder amount exceeds the floor limit
- Use a certified proprietary mechanism defined by the Terminal vendor to ensure that Discover Quick Chip Transactions are sent online.

4 Acquirer and Merchant Certification Requirements

D-PAS Host certification for Acquirers and Merchants is not impacted by Discover Quick Chip. Discover Quick Chip is certified at the Terminal level.

The Discover Quick Chip Terminal Certification Test Plan contains fewer test cases compared with standard EMV Chip Card Terminal certification. When Acquirers or Processors choose to support Discover Quick Chip, they will need to evaluate how to adapt their certification processes to support the Discover Quick Chip test plan in addition to the existing certification processes for standard EMV.

Merchants and Acquirers can support both Discover Quick Chip and standard EMV processing.

4.1 New EMV Deployments

For deployments of new Chip Card Terminals that will support only Discover Quick Chip Transactions, DFS has created a streamlined Terminal End-To-End test plan. This test plan contains fewer test cases than the plan for Chip Card Terminals supporting full EMV functionality.

Please refer to the [DFS CT D-PAS: CG] for details on certification.

4.2 Previously-certified Deployments

Discover Quick Chip does not impact EMVCo Level 1 or 2 approval.

For Chip Card Terminals already certified to support standard EMV, regression testing should be conducted when implementing Discover Quick Chip. DFS has created a test plan that includes regression testing and Discover Quick Chip-specific tests that should be performed before Terminal deployment.

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5 Issuer Considerations

Chip Cards issued on any of the Discover AIDs may be used at Discover Quick Chip Terminals. Issuers do not need to do anything to enable Chip Cards for Discover Quick Chip. However, this section highlights some potential impacts on Issuers when Chip Cards are used at Discover Quick Chip Terminals.

5.1 Transaction Amount

The Amount, Authorized (Tag 9F02) value in Field 55 of the Authorization Request Message received by Issuers may be different from the Transaction amount in Field 4. To prevent problems processing Discover Quick Chip Transactions, Issuers should confirm that:

- The Amount, Authorized value in Field 55 is used only for cryptogram validation and not for financial Authorization
- The value in Field 4 of the Authorization Message is used for financial Authorization
- Any mismatch between the Amount, Authorized and Field 4 should not be the sole reason for declining Authorization Requests for Chip Card Transactions.

Corresponding amounts will also be different in clearing messages that contain Field 55 data. If the Issuer validates the ARQC in a clearing message, they must do so using the Amount, Authorized value in Field 55. Any processing that reconciles clearing and Authorization messages must use the Transaction amounts in other fields and not the Amount, Authorized value.

5.2 Issuer Updates to Cards

This section outlines processing changes applicable to Discover Quick Chip that impact Card update processing.

5.2.1 Issuer Scripts

Discover Quick Chip Transactions do not support Issuer scripts because the Chip Card is removed from the Chip Card Terminal before the Authorization Response is received. Issuers therefore cannot rely on scripts being transmitted to their Cards during every Transaction. As Chip Card Terminals will vary in support of Discover Quick Chip, Issuers should be aware that their risk management controls will not be consistently applied.

At a Discover Quick Chip Terminal, all functionality managed with scripting will be affected. Issuers cannot, therefore, rely on scripts to block Cards that are reported as lost or stolen being supported at all Chip Card Terminals. Issuers should use the script counter along with the “Issuer Script Received” and “Issuer Script Failed” indicators in the Card Verification Results (CVR) to determine when a script was successfully processed by the Card.

5.2.2 Card Status Update (CSU)

Because the Chip Card is removed from a Discover Quick Chip Terminal before receipt of the Authorization Response, any updates to the Card contained in the CSU (for example, reset of offline risk management counters, update to PIN Try Counter) will not be processed at Chip Card Terminals supporting Discover Quick Chip.

Issuers may need to resend the same CSU in multiple subsequent online Authorizations, to ensure that updates are processed.

5.3 CVM Selection

If the CVM list includes rules based on Chip Card Transaction amount and a placeholder amount is used, CVM selection is based on the placeholder amount, not the final Transaction amount.

5.4 Cardholder Experience

As some Merchants may not implement Discover Quick Chip, Cardholder experience will vary from place to place when using the same Card. This difference may result in call center activity and require additional customer service representative training.

Issuers may want to make Cardholders aware of the changes that Discover Quick Chip introduces, and the impact it may have on Chip Card Transactions.