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A U.S. PAYMENTS FORUM WHITE PAPER

# Consumer Experience at the Contactless Point-of-Sale

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**U.S. Payments Forum**

4680 S Downing St.  
Englewood, CO 80113

[www.uspaymentsforum.org](http://www.uspaymentsforum.org)

## About the U.S. Payments Forum

The U.S. Payments Forum is a cross-industry body focused on supporting the introduction and implementation of EMV chip and other new and emerging technologies that protect the security of, and enhance opportunities for payment transactions within the United States. The Forum is the only non-profit organization whose membership includes the entire payments ecosystem, ensuring that all stakeholders have the opportunity to coordinate, cooperate on, and have a voice in the future of the U.S. payments industry. Additional information can be found at <http://www.uspaymentsforum.org>.

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## 1. Why Is the Consumer Experience at the Contactless POS Important?

One of the most tangible ways that consumers interact with the merchant, and therefore one of the merchant's best opportunities to shape the consumer experience, is the checkout experience at the POS.

As the U.S. implements contactless payments, merchants, issuers, terminal vendors, and other payment providers should be aware of the following consumer experience best practices:

- Consumers should be informed that they can tap through clear and consistent signage.
- The POS terminal should communicate when and where to tap during the transaction.
- Consumers should receive confirmation that their card was read and whether the transaction was approved or declined.
- Retail cashiers should be familiar with the experience for contactless payments to help consumers as they transact.

If all of these best practices are followed, merchants will be able to offer consumers a fast, easy, and trusted checkout experience that delivers on consumer expectations of seamlessness and convenience and leaves consumers with a favorable impression of their shopping experience.

## 2. Consumer Experience Best Practices

### 2.1 How Does a Consumer Know Contactless Can Be Used?

Merchants can use several methods to communicate to consumers that they accept contactless payments.

1. A merchant best practice is to display the EMVCo Contactless Symbol (Figure 1) prominently on the terminal and/or during the checkout experience if contactless payments are accepted. The symbol should be displayed *before* the consumer begins the checkout experience, because consumers usually decide on their payment type before the payment process starts.
2. Merchants can also leverage the terminal display screen to communicate contactless acceptance by prompting consumers to "Tap/Insert/Swipe" during the checkout experience.



**Figure 1. The EMVCo Contactless Symbol for Merchant Acceptance**

Additionally, many merchants already display mobile wallet acceptance marks. While these marks do indicate that consumers can tap, consumers do not associate these symbols with the acceptance of contactless-enabled cards. The EMVCo symbol is inclusive of both cards and mobile wallets, and is recommended to be displayed as the baseline for contactless acceptance, regardless of other acceptance marks.

To ensure consumers are tapping at the proper location, terminal vendors and merchants should position the EMVCo Contactless Symbol at the optimal location on the terminal (i.e., the location that is best for reading the contactless device). The optimal point varies depending on terminal manufacturer and even models from the same manufacturer. Merchants should work with their terminal vendor or acquirer to determine the appropriate location for the EMVCo Contactless Symbol on their acceptance device.

Merchants that do not accept contactless transactions should not display the EMVCo Contactless Symbol since this would lead to significant consumer confusion. Note that some payment terminals are being sold to merchants with the EMVCo Contactless Symbol on the body of the terminal; in these cases, a merchant should cover the symbol if they do not accept contactless transactions to reduce consumer confusion.

## 2.2 When Should a Consumer Tap?

While integrations vary among merchants, two implementation methods are generally used that influence when consumers can tap for contactless payments: Traditional EMV and Faster EMV.<sup>1</sup> In both implementations, it is best practice that the terminal should prompt consumers to tap and be ready to receive the tap at the same time when all other acceptance interfaces (insert/swipe) are also prompted and ready to be accepted.

- Traditional EMV requires the final total amount to be sent to the terminal before consumers can tap or insert.
- Faster EMV allows consumers to tap or insert before or in parallel with the tender being totaled. This is referred to as a pre-tap or pre-insert. Please note: the placeholder value used in pre-tap (determined by the merchant subject to payment network rules) can impact which application identifiers (AIDs) and cardholder verification methods (CVMs) are available to the merchant. Some terminals require cashier action before consumers are able to pay (i.e., the terminal needs to be in an active state). As implementations may vary, it is beneficial for the consumer experience and a best practice to have all payment interfaces (magnetic stripe, contact, and contactless) enabled at the same time, rather than requiring a separate action to enable the contactless interface.

Certain scenarios may call for different methods. For example, in self-checkout implementations, a common practice is to allow a tap after the total is known, since the consumer is also executing the checkout process. In a scenario with pre-authorization, such as petro, pre-tap should be used to initiate the order. Some self-service scenarios allow the customer to initiate the order with a tap. This is common when paying at a vending machine.

## 2.3 What Do Cashiers Need to Know?

Cashier training is crucial to a successful contactless implementation; training should be simple and easy. It is important that cashiers understand when, where, and how to properly execute a contactless transaction based on the merchant's implementation in order to minimize consumer confusion and provide a seamless and convenient checkout experience. First, retail cashiers should be aware of the

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<sup>1</sup> "Optimizing Transaction Speed at the POS," U.S. Payments Forum white paper, October 2017, <http://www.uspaymentsforum.org/optimizing-transaction-speed-at-the-point-of-sale/>. Both EMV and magnetic stripe contactless can support pre-tap and traditional transaction processes. EMV contactless is the recommended best practice; merchants should consult their requirements for new and existing implementations.

EMVCo Contactless Indicator (Figure 2). If this indicator appears on the front or back of a credit or debit card, the card is contactless-enabled and can be tapped to pay.



*Figure 2. EMVCo Contactless Indicator for Card Enablement*

### **When**

Both cashiers and the payment terminal should be able to tell consumers when they are able to tap during a transaction. The timing of a consumer's tap depends on the contactless implementation (as described in Section 2.2).

### **Where**

Cashiers should also be able to describe where consumers should tap on the terminal. The location should be clearly presented on the terminal. While the terminal should clearly indicate where to tap a device or card, the cashier will often need to help direct the consumer. As described in Section 2.1, the EMVCo Contactless Symbol should be placed to indicate the optimal read (antenna) location on the terminal. There are typically three places a consumer may tap:

- On the terminal: screen
- On the terminal: other location
- On a separate, contactless-specific device

### **How**

Cashiers should receive training on how to execute contactless transactions with both cards and mobile wallets. Cashiers should also be aware of the Cardholder Verification Method (CVM) options, including the Consumer Device Cardholder Verification Method (CDCVM)<sup>2</sup> for mobile transactions.

## **2.4 What Are Best Practices for the Consumer Transaction Flow?**

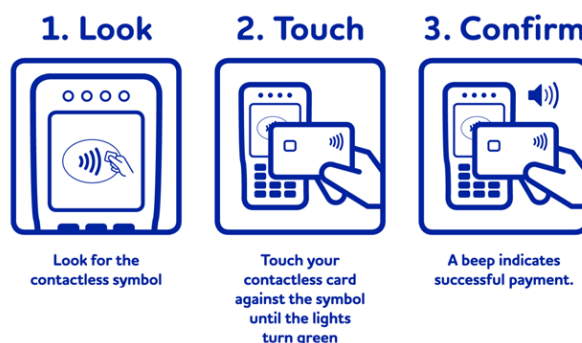
The optimal consumer experience will vary across merchant implementations and market segments. For example, checkout at a grocery store looks very different from checkout at a quick-service restaurant. However, several contactless best practices apply regardless of the merchant or segment.

1. The consumer is alerted to the fact that the merchant accepts contactless by the presence of the EMVCo Contactless Symbol before the checkout process is initiated, as described in Section 2.1.
2. At the appropriate time in the checkout process, the terminal prompts the consumer to "Tap/Insert/Swipe," as described in Section 2.2.
3. The terminal display is designed, and the cashier is trained, to help the consumer follow the prompts to complete the transaction.

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<sup>2</sup> Also known as the On-Device Cardholder Verification Method (ODCVM).

4. The terminal indicates a payment confirmation when the tap has been accepted. Often this confirmation is a message on the screen, but it could also be audible (e.g., a “beep”) or visual (e.g., a “green light”).
5. The terminal communicates that the transaction is complete. When the authorization response is received, the approved or declined result is displayed.



*Figure 3. Contactless Payment Process for Enabled Cards*

## 2.5 Cardholder Verification Method (CVM)

This section summarizes the impact of the CVM on contactless transactions.

In the U.S., CVMs, such as Signature, no CVM required, and PIN are supported with contactless, so a cardholder may tap and optionally sign or enter an online PIN when above the CVM limit. Currently, if merchants choose to process the transaction using the global AIDs, the CDCVM indicator shall be set when using a mobile wallet. CDCVM can be inferred if using the U.S. Common Debit AID for all networks.

**Contactless Transaction Limits.** A contactless transaction limit is a terminal configuration setting above which a contactless transaction cannot be performed. Some payment networks provide merchants with the option to set these limits; merchants should check with their acquirers for additional information. A contactless transaction limit is not the same as a CVM limit. There are no contactless transaction limits applied by networks that limit the acceptance of contactless tap for transactions over a limit. In the U.S., transactions of any amount may be completed with a contactless tap.

**CVM Limit.** A CVM limit must be set to determine when CVM processing is required to take place (signature or PIN). For transactions below the CVM limit, no cardholder verification is performed. This outcome is achieved either by using No CVM below the CVM limit or by skipping the CVM process altogether, depending on the related network requirements. However, for mobile wallet implementations, on-device cardholder verification may occur in order to activate the wallet, before the mobile device is tapped, and regardless of whether the transaction is over or under the CVM limit.

CVM limits are intended to simplify and speed up low-value, low-risk transactions.

Merchants are also reminded to ensure that signature is supported in the contactless kernels (where applicable), even if the merchant has opted out of requiring customers to sign. This will increase the number of instances where a card may be tapped above the CVM limit.

**CVM Processing for U.S. Debit Cards.** In the U.S., merchants may choose to route debit transactions to the network of their choice. To implement this choice for contactless transactions, the U.S. Common

Debit AID may be selected for processing.<sup>3</sup> If the U.S. Common Debit AID is chosen, the terminal may prompt for online PIN,<sup>4</sup> process as No CVM, or skip CVM processing, depending on the merchant's implementation and the transaction amount. Merchants that have specific routing preferences or offer cashback may want to automatically prompt for online PIN if supported, even if CDCVM is performed. Merchants should consult with their acquirers regarding the availability of the CDCVM for the U.S. Common Debit AIDs they support and their requirements for enabling online PIN prompting (in addition to CDCVM).

## **2.6 Contactless and CVM best practices at the automated fuel dispenser (AFD)**

Contactless best practices at an AFD can be trickier as they are unattended and may perform a \$1.00 authorization/status check followed by an adjustment/completion transaction. Thus, CVM limits and PIN Opt-Out require special attention to ensure an optimal experience at the AFD.

Some payment networks require an implemented solution to provide a mechanism for PIN Opt-Out. PIN Opt-Out allows a cardholder to transact with their qualified U.S. debit cards if they don't know their PIN or are unwilling to enter a PIN, while others may have issues with credit cards where the cardholder does not know or remember their PIN. For this reason, the following recommendations or best practices should be considered.

1. Support signature as a CVM or via "no CVM required", even though an AFD is considered to be an unattended device. Supporting signature does not require either signature prompting or signature capture, same is true for "no CVM required". It is purely to facilitate interoperability over the CVM limit when a limit has been set.
2. Consider using a pre-authorization amount that is consistent with network CVM limit requirements and the merchant's preferred terminal behavior.
  - a. If the merchant's preference is for the terminal to prompt for PIN for all contactless transactions, set the CVM limit below the pre-authorization amount.
  - b. If the merchant's preference is for the terminal not to prompt for PIN for contactless transactions, set the CVM limit above the pre-authorization amount.
3. If the merchant's preference is to encourage PIN entry, the CVM limit should be set to zero on the U.S. Common AID and online PIN must be supported.

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<sup>3</sup> See the U.S. Payments Forum publication, "U.S. Debit EMV Technical Proposal," available at <http://www.uspaymentsforum.org/u-s-debit-emv-technical-proposal/>, for additional details on implementation.

<sup>4</sup> Note that some issuers cannot support online PIN for tokenized transactions due to the lack of Track II discretionary data available for the real primary account number (PAN) after detokenization. This may impact issuer verification of the cardholder.



There are several methods for enabling PIN Opt-Out for contactless transactions:

- a. Setting CVM limits and pre-authorization amounts to obtain desired outcome.
- b. Presenting the cardholder with a Debit Y/N question is also an option, where N simply disables the PIN prompt.
- c. The merchant can also PIN prompt and use the Green or Enter button to continue without capturing PIN, but do **NOT** alter the TVR at all, specifically the PIN Entry Bypass TVR bit.

For clarifications on acquirer and network level rules, please consult your acquirer and/or network.

## 3. Common Technical Challenges

When implementing contactless payments, merchants may run into several common technical challenges. Typically, the challenges fall into two categories: technical interaction challenges and sources of customer confusion.

### 3.1 Terminal Interaction and Configuration Challenges

The most common issues involve either the consumer interaction with payment terminal, the mobile device/card interaction with payment terminal, read/interoperability conflicts at payment terminal, or some combination of these.

#### 3.1.1 Challenges with Consumer Interaction with the Payment Terminal

This issue occurs when the consumer taps, the cashier waits for payment, and the consumer needs to tell the cashier that a tap was performed. This issue may be caused by the consumer tapping before the payment terminal is available to accept contactless payment, requiring the consumer to tap again later. When this situation occurs, the cashier may be able to perform a function on the POS system, and then ask the consumer to tap again.

Options to prevent this issue include clearly communicating the preferred tap timing and programming the terminal to open all interfaces (i.e., tap/insert/swipe) at the same time.

#### 3.1.2 Challenges with Mobile Device/Card Interaction with the Payment Terminal

Section 2.1 discussed the importance of placing the EMVCo Contactless Symbol at the optimal read point on the terminal to ensure that the contactless card or mobile device contactless transmission is read effectively. In addition, mobile devices may have the contactless transmitter in different locations. If these variations in the mobile transmitter cause read challenges, the current best practice is to attempt another contactless read at the read point on the terminal that is optimal for contactless.

#### 3.1.3 Challenges with Read/Interoperability at the Payment Terminal

While the exception, merchants currently experience several types of read-method conflicts. The conflicts result from the various contactless-read methods supported by the terminal (i.e., magnetic stripe data (MSD) contactless and EMV contactless). These conflicts are expected to lessen as EMV contactless becomes more prevalent, and networks sunset MSD contactless. Examples of these technical conflicts include the following:

- Terminals may pick up the contactless signal while the card is being swiped due to the proximity of the magnetic stripe reader to the contactless antenna, and the consumer motion in moving

the card over the terminal to get to the magnetic stripe reader. This issue is most common on smaller devices and mobile POS (mPOS) systems. This issue could also occur with a card insert but is less likely, since the card is farther from the contactless interface during an insertion and the consumer will generally hold their card farther away from the terminal as they insert.

- Terminals can sometimes pick up a contactless signal from an unlocked mobile device that is below the terminal on the counter. While the terminal may not process payment using the nearby mobile device, the persistent attempts by the terminal to capture the mobile device's contactless signal can cause interference and delay its ability to read a card. In this case, a terminal stand is recommended to increase the distance between the countertop and any nearby phone.
- If a merchant's POS terminal supports only MSD contactless, processing issues may arise with contactless transactions at the POS. While mobile wallets are generally backward compatible with MSD, cards and wearables may support only EMV contactless transactions. This incompatibility can result in a technology mismatch at the POS; the contactless antenna in the terminal detects a contactless card, but the POS application is unable to process the data from the chip. The result is that incorrect transaction data may be sent to issuers, leading to lower approval rates than for EMV contactless transactions. Most POS terminals manufactured over the last few years have included EMV-capable hardware, which includes support for contactless EMV.<sup>5</sup>

MSD Contactless functionality is advised to be removed or disabled on the Merchant POS. Failure to do so may result in compliance actions from some networks.

## 4. Mobile Device vs. Card Considerations

Mobile devices, wearables, and contactless card form factors are increasingly being used to make contactless payments in the U.S.<sup>6</sup> Merchants should be aware of important differences between the form factors.

Because the same technology is used for mobile NFC and contactless card transactions, terminals that support mobile device transactions also support contactless card transactions; the reverse is also true. Cashiers should be aware of this fact and should not believe only a particular contactless payment type is accepted when contactless is enabled.

In general, NFC-enabled mobile devices transact in a very similar manner to contactless cards, with a few notable differences. First, the mobile device may require consumer authentication on the phone, and cashiers should be aware of this. In some cases, a PIN may still be required at the POS, even if the customer has performed device authentication. The second notable difference is that the mobile device may play a sound and provide a visual confirmation on the screen that the transaction was successful.

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<sup>5</sup> "Contactless Payments: Proposed Implementation Recommendations," Secure Technology Alliance Payments Council white paper, Section 2.2.1, January 2018, <https://www.securetechalliance.org/publications-contactless-payments-proposed-implementation-recommendations/>.

<sup>6</sup> U.S. Payments Forum Market Snapshot, December 2021, <https://www.uspaymentsforum.org/us-payments-forum-market-snapshot-continued-contactless-growth-buy-now-pay-later-takes-hold-and-chip-supply-challenge-persists/>

Regardless of this mobile device feature, the POS acceptance device should also provide an audible and/or visual confirmation of a successful tap.

Another difference is the account information used for processing the payment transaction. NFC-enabled mobile payments are tokenized (i.e., the payment card number is replaced with a different value). As a result, the merchant will not have the funding account number (including the last four digits of the card number) when processing the payment. Tokenization may impact loyalty functions, dispute processing, and debit routing. In addition, each device requesting a token for the same underlying card number will get a different token, further complicating the merchant's ability to provide services, like cross-channel returns, to consumers. Contactless cards, on the other hand, are not tokenized and allow access to the funding account number to be maintained as allowed by Payment Card Industry Data Security Standard (PCI DSS) rules.<sup>7</sup>

## 5. Conclusions

Contactless is the preferred payment method in many parts of the globe. Contactless payments are poised for mass adoption due to maturing acceptance, increasing availability, and growing consumer preference. Contactless payments provide a seamless consumer experience at the point of sale, serve as a fundamental offering for issuers and merchants, and drive cash conversion opportunities. Additionally, contactless is the underlying infrastructure that is required for new and emerging innovations in ways to pay including wearables, mobile devices, and beyond.

This white paper has described best practices for contactless implementation at the point of sale to ensure contactless payments maximize the speed and convenience they offer. Everyone in the payments chain should work to ensure that:

- Consumers know that they can tap through clear and consistent signage and use of the EMVCo Contactless Symbol.
- The POS terminal should communicate when and where to tap during the transaction through clear messaging and communication that directs the consumer to tap at the optimal read location.
- Consumers should receive confirmation that their card was read and whether the transaction was approved or declined.
- Retail cashiers should be familiar with the experience for contactless payments to help consumers as they transact.

If these practices are implemented properly, contactless will be more likely to deliver on its value proposition of making the checkout experience faster.

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<sup>7</sup> For more information on Payment Card Industry Data Security Standard (PCI DSS) rules, visit <https://www.pcisecuritystandards.org/>

## 6. Legal Notice

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