

MASTERCARD° AND MAESTRO° CONTACTLESS PAYMENTS

Contactless Toolkit for Merchants

DECEMBER 2016



19.7%

The Global Contactless Payment Market is poised to grow at a CAGR of around 19.7% over the next decade to reach approximately \$33.3 billion by 2025.

Report Linker Global Contactless Payment Market Analysis & Trends – Industry Forecast to 2025 We live in a rapidly evolving digital world, a world in which consumers are always connected. Increased connectivity is changing consumer expectations. They want faster and more secure seamless payment experience. You can meet these changing expectations by accepting Mastercard contactless payments.

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The term "payment device" refers to a plastic card, mobile phone or any other form factor used for payment, and "cardholder" refers to the user of the payment device.

The term "reader" refers to the equipment which the consumer taps, whether integrated into the POS terminal or connected to it.

Purpose of this Toolkit

This Contactless Toolkit for Merchants is designed to help merchants successfully implement a Mastercard contactless program and adopt best practices.



What is Contactless Payment?

In this complex and rapidly changing digital commerce environment, it is important we all have a common understanding of the role contactless payments plays in the digital landscape. This document describes the role of contactless payment within the digital ecosystem.

Merchants can benefit from the growth of digital commerce by preparing to accept digital payments across channels—e-commerce, in-app payment and at the point-of-sale with contactless payment.

Contactless payment acceptance is proven to bring many benefits for merchants, including faster checkout, increased transaction volumes, higher spend, and reduced cash handling costs. It also enables a new generation of mobile payments. Contactless acceptance is particularly applicable to high throughput, low value retail environments where cash is currently the predominant payment method. For such merchants, adding contactless capability through terminal upgrades or through simple plug-in devices will make sense at any stage of your POS lifecycle.



6.5 million

Mastercard or Maestro contactless cards or devices can be used at over 6.5 million merchant locations in 78 countries around the world.

Mastercard Data Warehouse, 3Q2016

WHAT IS CONTACTLESS PAYMENT?

Contactless is a payment method that gives your customers the convenience of making payments without swiping or dipping a payment card.

Instead, the customer simply taps their contactless-enabled payment device onto a contactless-enabled reader.

The chip and antenna in the payment device securely transmit payment details wirelessly to a contactless reader, either integrated within or connected to a merchant's point-of-sale (POS) system. For lower value payments, the customer will normally receive payment confirmation immediately and can be on their way. The transaction details are subsequently cleared through the same acceptance network used for traditional payment card transactions.

A Mastercard contactless payment is very similar to a contact chip payment in terms of its functionality and security. Both types of payment are generated by M/Chip and protected by EMV security.

Contactless cards look similar to standard Mastercard and Maestro cards. But embedded inside them is a computer chip that stores and processes the payment account data and a connected antenna that typically runs around the perimeter of the card. Similar chip and Near Field Communication (NFC) technology powers contactless payments made by mobile phones and other form factors.

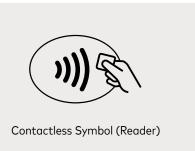
Contactless capability is denoted by the universal **Contactless Indicator** which is present on all contactless cards and form factors or should be displayed on the screen of contactless mobile devices.

A **Contactless Symbol** is present on all contactless readers to indicate compliance with EMV Contactless Communication Protocol, and the Contactless Symbol should also be used to indicate the "read area" on the reader where the payment device should be tapped.

Any payment device with a Contactless Indicator will work on any reader with a Contactless Symbol. This global interoperable acceptance is an important part of the Mastercard contactless payment proposition.



Contactless Indicator (Payment Device)



CARDHOLDER VERIFICATION

Traditional payments normally require some Cardholder Verification Method (CVM) such as PIN or signature. For low-value contactless payments below the "Contactless CVM Limit," no CVM is required—the customer can simply tap & go." Note that the Contactless CVM limit varies from country to country,

Cardholder verification is required for contactless card transactions above the CVM limit (e.g., by online PIN using the merchant PIN pad or signature). You are liable for contactless transactions above the CVM limit that have no cardholder verification.

A new form of CVM called Consumer Device Cardholder Verification (CDCVM) is available with mobile contactless devices. In this case, the customer enters a PIN (or biometric) on the mobile device. Two versions are supported:

- **Early CDCVM.** The customer provides the cardholder verification before the tap (typically while waiting in the line or queue).
- **Two-Tap.** The customer taps their device onto the reader to start the transaction, moves their phone away for CDCVM when prompted, and taps again to complete the transaction.

CDCVM can also be supported through biometric technology, if the mobile device is fitted with a fingerprint reader for example. Other verification methods may be supported in the future like pattern and vein recognition.

CDCVM is designed to work with new versions of the Mastercard contactless terminal, known as "Contactless Reader v3.0" or "MCL 3.0." These are being rolled out globally and Mastercard has mandated that all new contactless terminals are MCL 3.0 compliant.

For contactless transactions below the CVM Limit, a receipt is not required unless the customer requests it. For transactions above the limit, a receipt must always be provided.



CONTACTLESS MODES

Contactless payments may be Magstripe mode or EMV mode.

In countries which have not yet migrated to EMV chip, the majority of contactless transactions will be Magstripe mode. Contactless magstripe cards contain a chip as well which generates the same data as that generated by swiping the card, with the addition of a code, the dynamic CVC3. In order to authenticate this code, all Magstripe mode contactless transactions should be authorized online by the issuer. This in turn means that contactless terminals must be installed with authorization connections.

In countries which have migrated to EMV chip, the majority of contactless transactions will be EMV mode. In this case the chip may support Mastercard's M/Chip payment application which is capable of authorizing transactions offline, without the need for an online transaction to the issuer. Such off-line authorization is faster than online authorization and is therefore normally employed, especially in environments with high throughput or less connectivity. For added security M/Chip makes use of counters for risk management. An issuer can set these counters to require a contact rather than a contactless transaction whenever the number or cumulative amount of contactless transactions has reached certain limits.

Contactless transactions initiated by mobile devices may optionally support other risk management features:

- "No-CDCVM Counters" (sometimes referred to as "Lost & Stolen Counters")
 which periodically force CDCVM after a certain number or amount of No-CDCVM
 transactions.
- Payment Activation ("Say When I Want To Pay") which allows the customer to switch on mobile payment only when they want to use it, and switch it off the rest of the time.
- Amount Acknowledgement ("Confirm Amount I Want To Pay") which is the process
 of obtaining a positive action by the customer, typically a single press or CDCVM,
 to confirm that they approve the transaction amount.



1 CVC: Card Verification Code



Frequently Asked Questions

How will accepting Mastercard Contactless benefit my business?

Contactless acceptance is proven to bring many benefits for merchants including:

- Faster checkout time
- Reduced costs related to cash handling
- Increased payment transactions
- Higher average spend
- Support for mobile NFC payments

What types of merchants can benefit the most from contactless acceptance?

Contactless acceptance is an excellent choice for any merchant, especially in environments where speed and convenience are valued and cash is currently the dominant payment method, such as, supermarkets, quick-service restaurants (QSRs), drive-thrus, convenience stores, vending machines, tollbooths, taxis, parking venues, fuel pumps and public transport. Contactless payment is recognized as the only realistic option for ticketless mass transit systems.

How safe are these transactions?

Mastercard has put in place a number of measures which mean that contactless payments are highly secure:

- Every contactless transaction is protected by a unique code which proves that the payment device is genuine and means the transaction cannot be fraudulently replayed.
- Below the CVM Limit all EMV mode transactions are either authorized off-line subject to offline risk management, or are authorized online. All Magstripe mode transactions are authorized online.
- Above the CVM Limit the customer will be prompted to use PIN, signature or CDCVM.
- The POS Entry Mode field in all contactless transactions is set as "contactless" to verify that transactions properly originate at a contactless terminal.
- With mobile devices, a variety of additional security measures are possible, and issuers may also choose to use "tokens" instead of "real" card account numbers (PANs) in a process called "tokenization."
- The customer keeps possession of the payment device throughout a contactless payment transaction.
- Transactions are conducted only if the merchant has initiated the transaction and usually when the device is about 2 cm from the reader.

Does contactless acceptance change the payment guarantee for the merchant?

If a contactless payment is authorized, online or offline, the merchant still receives a payment guarantee, even for transactions below the CVM limit with no cardholder verification.

How does pricing work for merchants—do contactless transactions cost more or less than traditional credit and debit transactions?

The use of the contactless technology has no bearing on pricing. Pricing still depends on the underlying, existing payment product.

What are the costs involved?

Costs will vary depending on the selected solution. To accept contactless payments, you can choose to implement a plug-in peripheral reader or a fully integrated system.

What type of technology is used for contactless?

In keeping with the overall Mastercard strategy to create globally interoperable payment solutions, contactless payments are compliant with all relevant industry standards including EMV.

How are contactless readers identified?

To use a contactless payment device, consumers must look for the universal Contactless Symbol as described above. You should make sure the symbol is displayed on the read area of all contactless readers. It is also best practice to display appropriate signage alerting consumers

to the availability of contactless payment and encouraging them to use it.

How is accepting mobile payment different from cards?

To the merchant, mobile payments will look like contactless card payments, except the consumer may verify their identity using a PIN or biometric on the mobile device.

In the longer term, it is expected that mobile payments will enable a range of new opportunities such as sophisticated loyalty schemes, GPS alerts, or customers scanning QR coupons in-store, or from a PC or poster and GPS alerts.





Five Steps to Implementation

1. PRE-ACCEPTANCE PLANNING

Successful initiatives don't just happen, they are planned. That's why we recommend taking the time to develop a comprehensive contactless project plan. Gather the right resources and stakeholders to discuss the project in its entirety to help ensure a successful implementation.

Like any important initiative, contactless implementation requires good project management and this involves appointing the right project manager, involving all stakeholders from the outset, and above all, agreeing on a plan which addresses all key issues now and in the future. And like any POS terminal project, it is important to work closely with your acquirer, choose the best equipment from reputable vendors, and consider carefully the layout of equipment in stores and how you will roll out over multiple locations, if applicable. Certain considerations are particularly important for contactless implementation projects, and deserve special attention at the planning stage, including the following:

- Think hard about the future. Contactless payment is likely to be the first step in a larger global adoption of mobile payments which could provide imaginative, innovative merchants with significant business opportunities in the future, as explained earlier.
- Make sure you understand any special rules and practices which apply to your local market such as CVM limits, offline authorization policies, EMV migration status, and so on. Your acquirer will help but it may also be worth talking to a national payments authority if one is available.
- Plan how to maximize the benefits of your move to contactless, through first class staff training in particular, but also through effective communications with customers more generally and possible rewards and other incentive schemes. Tier 1 merchants with their own co-branded cards in countries such as Canada and France have very successfully launched simultaneous contactless card and acceptance programs.
- Consider the best strategy for coordinating contactless implementation with
 existing POS equipment lifecycles. Should you use plug-in readers or upgrade to
 new, fully integrated terminals? In the US, the migration to EMV is likely to be a good
 opportunity for a more comprehensive terminal upgrade strategy.

Best Practices



Work closely with your acquirer to make sure you fully understand local market conditions and rules.



Treat contactless implementation as just part of a larger POS strategy.

2. IDENTIFY REQUIREMENTS AND ORDER EQUIPMENT

Now it's time to make sure you have the infrastructure in place to accept contactless at your merchant locations so you can order the right equipment.

Conduct a Site Survey

Just as you do when purchasing any new equipment or accessories for your merchant location, you'll want to take a careful look at your floor plan with your acquirer. If the layout is different at each site, examine each separately, taking into account such considerations as where the electrical outlets are, how much counter space is available, and the locations of data ports. Anticipate and plan for the differences that each site implementation may present.

Remember that each site may present unique challenges—such as the location of underground conduits for drive-through solutions or special cabling requirements for reader integration to standard terminals.

Best Practices



Contactless readers should be customer facing.



Customers should not need to tell the cashier how they intend to pay.



The contactless reader should always be switched on and ready to use; the cashier should not need to switch

it on.



The cashier should not need to enter the amount twice; it should be automatically displayed on the reader.



Avoid positioning readers close to electrical equipment or metal objects which might interfere with operation.

Determine POS Requirements

You'll want to first determine with your acquirer whether you'll be implementing an overall POS upgrade to an integrated POS solution; or whether existing equipment can support plug-in contactless-enabled readers and the appropriate terminal application.

Ensure that the operational procedure at the point of sale is optimized to reap the benefits of contactless acceptance. After extensive review by Mastercard the best practice guidelines set out above are recommended.

Select Hardware

Based on the results of your site survey, you'll need to select appropriate numbers of readers from reputable vendors. Acquirers and payment service providers can help determine which solutions will work best for your environment.

All readers must be approved by Mastercard; ask for proof of this when procuring contactless-enabled terminals or readers.

Order Equipment

Your Acquirer can provide you with a list of approved contactless products.

Ask your vendor or acquirer about the time frame for delivery. Most vendors or acquirers need a minimum of 6–8 weeks for delivery, depending on the size of the order.

Make sure to order readers with the decals, cables, brackets, and pedestals or stands needed for your POS installation. Decals should be affixed by the hardware vendor prior to shipping.

In countries which have not yet migrated to EMV chip, Mastercard strongly recommend that contactless be installed with high-speed authorization connections, since Mag Stripe mode contactless transactions must all be authorized online, as mentioned earlier. Delays caused by slow telecommunication systems do not deliver the desired consumer experience at the POS and can limit the merchant's ability to realize the benefits of contactless. All major acquirers can provide high-speed network transaction processing solutions.

Note that Mastercard now requires migration of all contactless-enabled terminals to Mastercard Contactless Reader Specification version 3.0 (MCL 3.0) (formerly called *PayPass* version 3.0). MCL 3.0 readers are required in order to support cardholder verification of mobile device payments above the CVM limit and bring several other important benefits.

Identify Software Needs

Whether, or to what extent, you require software modifications will depend to a large extent on whether you are upgrading to new, fully integrated POS solutions with contactless functionality already built in, or whether you are using existing POS equipment. If the latter, then it is important to ensure that you and your acquirer have addressed all contactless requirements, including, in particular, the coding of contactless transactions and contactless chargeback rules.

Transaction Coding

In order to manage risk and properly track contactless usage, acquirers and processors need to be able to identify contactless transactions and monitor contactless terminal capability. This identification is accomplished through coding of Data Elements within authorization request and clearing messages. Once identified via coding, contactless transactions are considered Data Element, or DE, compliant.

New values have been identified for certain existing data elements in the Mastercard-defined authorization and clearing records. Payment terminals and all intervening systems and messages must be able to identify the "POS Entry Mode" and "POS Terminal Input Capabilities" to allow these new values to be populated. Your acquirer will make these coding changes.

To measure the impact of contactless payments, you can request contactless transaction reports from your acquirer if available. Acquirers can help determine a merchant's analytical needs and recommend reports.

Chargebacks

In general, transaction liability for contactless transactions remains the same as when a payment is made with a regular payment card. A notable difference however is for contactless transactions where the amount is at or below the CVM limit. For these transactions, you are not required to obtain a CVM.

3. TEST

The importance of testing all aspects of your contactless solution before deployment cannot be overstated. Testing is your opportunity to uncover and fix any errors that may have occurred during development.

As with any POS development, thorough testing is a key success factor for contactless deployment. While testing is mainly your acquirer's responsibility, following strict Mastercard procedures, you as a merchant need to be fully engaged and ensure that adequate time and resources are allocated to this critical step.

Certify Software and Equipment

To help ensure that all transactions follow your transaction process map correctly, certify your software and equipment with your acquirer and processor before your pilot or deployment.

Request Cards and Devices for Testing

Test cards are available to help conduct testing. Make sure your acquirer orders a full set.

Increasingly, it will be important to also test that contactless mobile payments work as expected. To ensure integrity and interoperability, all elements of an M/Chip Mobile implementation are required to be Type Approved by Mastercard. Make sure your acquirer provides examples of type approved mobile devices and helps you test operations under a variety of configurations.

Conduct Testing

Acquirer Testing

Mastercard strongly recommends that you contact your acquirer to conduct compliance testing for your systems and for each new terminal type or version using test payment devices. Your acquirer will carry out a number of different tests including Network Interface Validation (NIV), Mastercard Terminal Integration Process (M-TIP) and an End-To-End-Demonstration (ETED).

Laboratory Testing

Mastercard recommends that your acquirer test contactless in a controlled laboratory environment before installation at a live site.

End-to-End (Live) Testing

Once lab testing and installation are complete, an end-to-end set of test transactions should be conducted across all planned deployments, including pilot locations, rollout locations, and future locations. Your acquirer will perform the following:

- Check for accurate tactical deployment of hardware and that appropriate DEcompliant software is running.
- Perform an audit by using live test cards and other devices to perform transactions covering all types of payment products.

Best Practices



Don't skimp on testing. Effort spent on this step will save time and money during later deployment.



Allow plenty of time. Acquirers and card schemes will be dealing with multiple entities so schedule generous testing slots well in advance.



Make sure you are populating the POS Entry Mode identifier correctly.



Test for as many use cases as possible, including:

- Mag Stripe mode and EMV mode cards.
- Mobile payment devices configured in a variety of ways.
- Payment devices issued to foreign customers.



4. TRAIN STAFF

Extensive staff training is vital to the success of a contactless payment implementation. In this section, you'll find the information needed to create training materials, in order to ensure all staff understand what contactless payment involves and how to deploy it to maximum advantage.

Training is one of the most critical aspects of contactless implementation. It is extremely important for your cashiers and other staff to understand the differences between contactless and traditional payment methods, and the way contactless payments are processed.

Employee training that instills confidence in the technology and encourages use by customers is critical to a successful deployment. Training must be consistent and ongoing so employees know how to use it and can explain it to customers. Employees should learn to prompt customers to use their contactless-enabled payment device to encourage activation and usage.

Be sure to cover these key points in your training:

Variety of Forms

Contactless payments are available to consumers in a variety of forms and factors, including cards, key fobs, mobile stickers, and mobile phones.

Identification

There will be contactless identification in the form of the Contactless Indicator on a contactless card or form factor, and there should be a Contactless Indicator on the screen of a mobile device, as well as a Contactless Symbol on the reader.

Card Verification

Contactless is ideal for low-value payments, but high-value payments are also possible in most countries. For purchases above your region's CVM limit, signature, PIN or Consumer Device Cardholder Verification (CDCVM), and receipt printing is required. In EMV markets, for added security a contact card PIN-verified transaction may be required occasionally as explained earlier.

Security

Some customers will be nervous about the security of contactless payments. Explain to staff why contactless is actually highly secure so that they can reassure customers.

Signage

The most effective merchants display POS collateral that lets customers know contactless payments are accepted. Consider also including information about contactless acceptance in your marketing and advertising materials. This will help to build awareness of contactless payments, encourage use, and strengthen customer satisfaction.

Best Practices



Create a training program for employees and store managers:

- Keep it current.
- Take advantage of available materials from Mastercard.
- See Sample Curriculum below.



Communicate the benefits of contactless to your customers:

- Encourage staff to promote contactless as advocates and educators.
- POS signage.



Conduct refresher training:

- Keep employees engaged.
- · Onboard new employees.
- Consider "train the trainer" programs.

Sample Employee Training Curriculum

1. Describe contactless payments—what they are, how they work, form factors

- Contactless devices can be anything that can hold a chip and antenna: credit card, key fob, wristband, mobile phone.
- Works the same way as a regular payment card. The only differences are that
 the customer retains the card or device during payment of the transaction and
 taps the card or device onto the reader.
- Can be used in stores around the world at any merchant category. Examples include:
 - Convenience/drug stores
 - Fast food restaurants
 - Gasoline/petrol stations
 - Stadiums
 - Supermarkets.

2. How to recognize a contactless card or other contactless device

• If the customer's card or form factor is enabled with contactless there will be the Contactless Indicator shown here.



- In the case of a mobile phone the Contactless Indicator should appear.
- If the customer's mobile phone is enabled with contactless there should be a Contactless Indicator on the screen.
- Your contactless terminal will have a similar Contactless Symbol indicating where the customer should tap:



3. How transactions work

- Walk through an end-to-end transaction:
 - Enter the transaction.
 - Total the transaction.
 - The customer will tap their payment device on the reader. The reader will light up and beep as the card is read. On the display window of the payment terminal itself, it will say that the transaction is being processed (unless it is not an integrated reader).
 - If the merchant has set up their system to supply a receipt, one is printed if the transaction was processed successfully. A receipt may not be required for transactions less than the CVM limit (regional CVM limits apply).
 - There is no signature or PIN required for transactions below the CVM limit.
 - If contactless transactions above the CVM limit are allowed, the customer
 will be prompted to enter a PIN on the reader PIN pad, sign a receipt, or use
 CDCVM (PIN or biometric such as fingerprint entered on the mobile phone)
 if using a mobile phone.
 - Customers paying with a mobile phone may use "Early CDCVM" or "Two Tap" sequences, and may be required to activate their device or confirm the transaction.
 - Occasionally, customers may be forced to carry out a contact transaction, or if using a mobile device, may be forced to use online PIN as an additional CVM. This is for their security.
 - Below the CVM limit, no receipt is required unless the customer requests it.
 Above the limit, a receipt is required.

4. Set up a mock terminal workstation

- Having an actual workstation at the training session is extremely helpful in demonstrating how transactions work with contactless.
- Demonstrate how accepting contactless is similar to accepting any other card, with the key differences being:
 - Not taking the card from the customer. The customer will tap the payment device against the reader, no need to swipe/dip it.
 - No signature, PIN or CDCVM required for transactions at or below the CVM limit.
- All contactless payment devices, not only Mastercard contactless, will work on the reader device.

5. Role-playing

• With the mock terminal set up, allow employees to enter transactions to see how the contactless transaction works in a training setting.

Note that Mastercard now offers an e-learning platform which can be used to form part of a merchant's employee training program.

5. PUT CONTACTLESS TO WORK

If you have followed all the steps outlined in the previous phases, you're just about ready to start offering the speed and convenience of contactless to your customers. This section offers information on deployment, with or without a pilot, along with suggestions for postimplementation management.

Develop Deployment Schedule

Your deployment schedule should take the following considerations into account:

- Need for a Pilot—Consider whether you need a pilot project before full rollout.
 Contactless technology is now fairly mature so for smaller merchants in regions where contactless payments are already established a pilot is probably not required.
 For merchants that are pioneering contactless acceptance in their local markets, or for larger merchants with multiple locations, a pilot is recommended.
- Locations—Select the number of locations and determine the order in which installations will take place; decide whether and where to pilot; and decide who will install the equipment.
- Timing—Optimize the timing of your pilot and rollout.
- Testing—Identify how testing will occur throughout the pilot and rollout process.
- **Training**—Identify the training tools and processes that will be provided to each store as contactless payments are deployed.

Conduct a Pilot (if Required)

A pilot will help ensure that cashiers are adequately trained, software and hardware are working correctly, and your site is set up correctly before you move to wider deployment. Here are the key steps:

- Install equipment.
- Perform training.
- Perform an audit of the pilot site.
- Observe and record problems, solutions, and opportunities at the pilot location(s).
- Adjust processes as necessary and integrate best practices before initiating a full rollout.

Implement and Monitor Rollout

After a successful pilot, you'll be able to confidently roll out your software and hardware to all designated locations. To help ensure that your customers have a positive contactless payment experience at your stores, you need to continuously monitor and actively address any issues that arise during and after implementation.

POS Signage

Merchants have experienced success with POS signage that clearly and simply illustrates how to use contactless. Consider simple signage on, near, or surrounding the readers.

Usage Campaigns

Getting contactless-enabled cardholders to activate and establish the tapping habit can be done effectively through usage incentives like a "tap & get" promotion.

Prominent promotion displays, especially near the POS, should be used so that consumers know the functionality and the reward.

Audits

Quality audits performed regularly are critical to deployment success. They can help to:

- Increase the number of installed readers and decrease the number of disabled readers.
- Resolve technical issues and answer questions about how and where to tap on the reader.



Ensure Ongoing Success

You and your customers are most likely to benefit from contactless if you make an ongoing effort to ensure success by taking the following steps:

- Create a team responsible for ongoing maintenance and support of the contactless infrastructure. Among other things, the team should make sure that POS software upgrades do not affect acceptance or Data Element compliance.
- Identify all ongoing support needs—from technical specifications to documentation and test facilities.
- Remember to schedule future implementations to account for your sales cycle and avoid disruptions at peak periods, such as the holiday season.
- Make sure any and all program changes are fully planned and documented.
- Prominently display Mastercard contactless POS signage to let consumers know that Mastercard contactless is proudly accepted.

Best Practices



Make sure staff are fully trained, engaged with the rollout, and encourage customers to tap and go.



Focus on making sure customers are aware of the contactless payment option and have a positive experience.



Profit from experience and don't be afraid to fine-tune deployment based on lessons learned.



For more information, contact your Mastercard customer representative or email contactless@mastercard.com