

EMV CARD READER EVALUATION FOR USE WITH PARABIT SYSTEMS ATM LOBBY CARD ACCESS CONTROL SYSTEMS

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OVERVIEW

For 20 years, Parabit has been successfully providing reliable Magnetic Stripe Card ATM Lobby Card Entry Access Control and will continually update our solution to stay ahead of our financial clients' needs. The introduction of Contact EMV Technology (<u>E</u>UROPAY, <u>M</u>ASTERCARD and <u>V</u>ISA) as a new U.S. standard, creates a challenge of evaluating the use of the Contact EMV Card Reader as a reliable Access Control media for card readers installed outdoors within storefronts for ATM Lobby/Vestibule Card Entry Access Control.

Most if not all countries outside the US that support Contact EMV are also supporting Contactless EMV technology. Most cards issued outside the US are cards with a Contact EMV Chip, Contactless EMV Chip, and a Magnetic Stripe. (*NOTE: Contact EMV and Contactless EMV, when combined on a card, is referred to in industry as "Dual Interface" – for the purposes of this white paper, Parabit will refer to Contact EMV, Contactless EMV, and Magnetic Stripe Cards as "Tri-Media Cards"*).

Contactless EMV is being used as a small value chip loaded with a daily purchase limit of 20 to 100 Euros used for quick convenience store purchases.



Source: https://www.emvco.com/



INTRODUCTION TO EMV

The EMV standard defines the interaction between the EMV cards and EMV card processing devices for financial transactions at the physical, electrical, and application levels. The (Contact) EMV standard was created in 1989, first as a value loaded chip, and then several years later the technology was modified to support real-time transaction authentication for ATM and Debit Card transactions.

There are two types of EMV card technology:

- 1- Contact EMV
- 2- Contactless EMV

Images of the two types of Contact EMV Card Readers; Pin with a Card Lock and Sled with reliance of the user to leave the card in the reader until the card has negotiated and has permitted the card reader circuit to query the card:



Images of the two types of Contact EMV Card Readers; Pin with a Card Lock and Sled with reliance of the user to leave the card in the reader until the card has negotiated and has permitted the card reader circuit to query the card.



NOTE: "Landing" readers have been invented as another way to read Contact EMV Cards. These are unreliable due to mechanical error and debris build up.



CONTACTLESS EMV CHIP TECHNOLOGY

Contactless EMV chip technology utilizes radio frequency (RF) waves to communicate with the EMV card reader. The transfer of data between the EMV card and the EMV card reader is achieved through electromagnetic induction between the antenna of the EMV card reader and the antenna embedded into the EMV contactless card.

Most if not all ATM/Debit Cards issued outside the U.S. are Tri-Media Cards; Contactless EMV Chip, Contact EMV Chip and Magnetic Stripe.

Contactless EMV Chip Card technology sample antenna and chip layout:



Examples of "Tri-Media Cards" (Contact EMV, Contactless EMV and Magnetic Stripe)





SHOULD A CONTACT EMV CARD READER BE UTILIZED FOR ATM LOBBY/VESTIBULE CARD ACCESS CONTROL?

The main considerations in avoiding the use of a Contact EMV Chip card reader within our New Multi-Media Contactless EMV/NFC and Magnetic Card Reader (MMR) with SkimGard[™] technology are as follows:

- **1- OUTDOOR ENVIRONMENT**
- 2- WEAR AND TEAR
- **3- EASE AND SPEED OF USE**
- 4- FORWARD COMPATIBILITY/USE
- 5- DESIGN OF CONTACT EMV CHIP READER HEADS
- 6- ABILITY TO SKIM CONTACT EMV CHIP TECHNOLOGY
- 7- ABILITY TO SKIM CONTACTLESS EMV CHIP TECHNOLOGY

1. OUTDOOR ENVIRONMENT

Since its inception in 1995, Parabit has been at the forefront of outdoor ATM Lobby/Vestibule Card Entry Access Control. In partnership with its vast number of financial institution clients, Parabit has continuously reengineered its product to provide the most reliable outdoor Card Access Control Solution.

Years of experience has shown Parabit that effects of the outdoor elements on electro mechanical contacts (Magnetic Stripe Card Reader Head) prove to reduce Card Reader reliability due to:

- ✓ Build up Dust / Debris / Vehicle Exhaust
- ✓ Water, Humidity and Ice
- ✓ Extreme Temperatures and Extreme Temperature Changes

The Magnetic Stripe Read Head is a smooth single curved surface. When Dust, Debris and Vehicle Exhaust builds up on a magnetic stripe read head, cards that are inserted into the reader tend to "polish" (remove dust and debris) from the magnetic stripe read head. In addition the Magnetic Stripe Read Head is a single track two read head. Magnetic Stripe Card Readers are also easy to clean with a magnetic stripe read head cleaning card.

Contact EMV pins are smooth, curved surfaces, gold plated to remain smooth with use. However, debris tends to build up under the collapsible contact readers, and cards cannot be fully inserted, and/or cards get stuck, and/or there is a faulty card read.



Parabit's opinion on use of Contact EMV for ATM Lobby Card Access Control in an Outdoor Environment:

Considering Contact EMV Chip cards have 6 to 8 (and sometimes, 10) contacts dramatically increases the probability that if one pin does not make contact with the EMV Contact Chip, the client will not gain access to your ATM Lobby/Vestibule.

Decreasing the reliability of Card Access Control to your ATM Lobby/Vestibule by utilizing Contact EMV Chip technology will increase the cost of maintaining reliable ATM lobby access control, decrease ATM interchange/surcharge revenue as well as provide a negative customer experience using your ATMs.

Note: <u>Contactless</u> EMV technology is a better design to help mitigate the effects of an outdoor environment.

2. WEAR AND TEAR

Parabit's opinion on use of Contact EMV for ATM Lobby Card Access Control related to Wear and Tear:

Contact EMV cards have 6 - 8 conductive contact pads embedded on the surface of the card. The Contact EMV Card Reader needs to make a connection to **all** 6 - 8 pads to inquire and transfer card data from the Contact EMV Chip. Wear and tear on a single or a few contact pad(s) has a great effect on the reliability of the contacts, thus decreasing reliability of the access control system reader being able to read the card.

Decreasing the reliability of Card Access Control to your ATM Lobby/Vestibule by utilizing Contact EMV Chip technology will increase the cost of maintaining reliable ATM lobby access control, will decrease ATM interchange/surcharge revenue, and will provide negative experiences for customers using your ATMs.

Note: <u>Contactless</u> EMV technology is a better design to help mitigate the effects of Wear and Tear.

3. EASE AND SPEED OF USE

Parabit's opinion on use of Contact EMV for ATM Lobby Card Access Control related to Ease and Speed of Use:

A Contact EMV Card Read requires seconds to first charge the EMV Chip to wake up to operate, then interrogate the EMV Chip to obtain the issuer ID, then launch the Kernel to request the Bank BIN # and the Primary Account #.

EMV CARD READER EVALUATION – WHITE PAPER



However, Contactless EMV technology was developed to increase the speed of the EMV reaction time to a Contactless Readers card wake up and interrogation of the card issuer and bank BIN and PAN. Contactless EMV technology offers a faster therefore more convenient customer experience. Contactless EMV Chips provide a 15-30% faster read response compared to the Contact EMV Chip card read process.

Note: <u>Contactless</u> EMV technology is a better design to help mitigate the slower Contact EMV Chip read process.

Magnetic Stripe Card Reading is faster than Contact EMV and Contactless EMV which provides for a better customer experience when accessing the ATM Lobby Vestibule.

4. FORWARD COMPATIBILITY/USE

Parabit's opinion on use of Contact EMV for ATM Lobby Card Access Control related to Forward Compatibility/Use:

Mobile payment solutions are being developed and adopted all over the world and its use is expected to exponentially increase year by year. Mobile device compatibility with EMV Contactless applications highlights our priority of development of the Contactless EMV/NFC Card Reader feature within our MMR (Multi Media Reader – Magnetic Strip, Contactless EMV, and Mobile Phone Medias).

What better customer experience can be provided to the customer who is walking down the street with what is so commonly in the hand of the modern consumer? Waving one's Mobile device over a reader to gain access to an ATM Lobby is the ultimate convenience, and is more safe and secure. Developing a card reader that supports mobile devices keeps customers from opening their wallets in the street to gain access to your ATM Lobby/Vestibule.

As we move forward in this age of evolving Mobile Technology, the onus is on the financial institutions to allow consumers to interact with them (including the ATM) the way they want to — with simplicity, swiftness, convenience, and as few restrictions as possible. Consider what the use of Mobile Devices NFC can bring to your customer experience at the ATM Lobby Card Access Control System and your ATMs.

- PIN Entry on the Customers Phone instead of the ATM. PIN capture devices have been very hard if not impossible to detect on the ATM.
- The Mobile Phone offers multiple communication platforms to authenticate a transaction:
 - NFC
 - Text
 - Email
 - Bluetooth



 Most customers are married to their phones, so what better experience than not having to reach into your wallet/purse to pull out your ATM card to enter the ATM Lobby.
Wave your phone over the Card Reader to gain access.

Parabit's Contactless EMV/NFC and Magnetic Stripe (MMR) with SkimGard[™] technology will offer a convenient and faster way to access an ATM lobby through the use of Mobile devices that implement Mobile payment and ATM transaction authentication applications.

Parabit's MMR will support Mobile payment applications such as:

- ✓ Apple Pay
- ✓ Samsung Pay
- ✓ Google Wallet

5. DESIGN OF CONTACT EMV CHIP READER HEADS

Parabit's opinion on use of Contact EMV for ATM Lobby Card Access Control related to Design of Contact EMV Chip Reader Heads:

Contact EMV cards have six (6) or eight (8) conductive contact pads (only 6 are supported at this time) embedded on the surface of the card and the Card Reader makes direct connection to these pads for the transfer of data. To make the direct connection, the EMV card is inserted into the EMV card reader where the 6 or 8 (a) Pin EMV Chip Reader (Card Locked in Reader) or (b) Sled EMV Chip Reader (Card must stay inside the Reader) contacts charge the EMV Chip to wake it up, so the EMV Contact Chip Card Reader may begin an authentication process with the chip on the card and then read the BIN and PAN of the EMV Contact Chip.

Note: <u>Contactless</u> EMV technology is a better design to help mitigate the slower speed of the Contact EMV Chip read process.

6. ABILITY TO SKIM CONTACT EMV CHIP TECHNOLOGY



Shimmer Contact EMV card skimmers are now being found within ATMs, where the skimmer is a thin layer of circuitry that can be inserted into a Card Reader; this contains a pass-through circuit that listens in on the communication of the reader to permit capture of the BIN and PAN of the card. Most ATM card reader slots are large enough to permit the insertion of the Shimmer:

Parabit's SkimGard[™] Readers slot only supports an opening to allow a card to be inserted into the card reader. If a Shimmer was

inserted into a SkimGard[™] reader, a card would not be able to be used and an alarm will trip.



7. PREVENTING ABILITY TO SKIM CONTACTLESS EMV CHIP TECHNOLOGY



RFI interceptors have been created where someone holding the interceptor circuit within approximately 4 inches from someone's wallet can charge someone's Contactless EMV Card and then interrogate the card to capture the cards BIN and PAN.

Parabit's MMR (Contactless EMV/NFC and Magnetic Strip Card Reader) contains an RFI detector so if an RFI Skimmer is placed

within 3 – 4 inches of the reader, the ACS-1E panel will send an RFID Overlay Event Message.

CONCLUSION:

The required migration to Contact EMV Chip technology in the US will be a slow process because of the costly investment required to convert ATM/Debit and Credit Cards to Contact EMV Chip with a Magnetic Stripe in addition to the technology required to support Contact EMV Chip on the ATM's. The mandatory conversion to a 25 year old technology that provides a single point of authentication to process a transaction, similar to the Magnetic Stripe, is a bad investment into trying to protect customer data.

In our opinion, supporting Magnetic Stripe, Contactless EMV, and NFC (Mobile) – what we refer to as Multi Media in our new Reader and Access Control Product - is a better investment. Supporting Multiple Medias to process a transaction allows Banks and Credit Card companies to offer a multi-tiered approach to transaction authentication and processing.

Ultimately, what are most customers walking down the street with in their hands? Their Mobile Device. What better security could be provided than where a customer can wave a phone over a reader to gain access to an ATM Lobby, or to start a transaction on an ATM or POS terminal, enter their PIN on their Phone via an app, and then wave their Contactless EMV card over the same reader to complete the transaction authentication process (The old "Dual Control" security measure).

The use of the SkimGard[™] Card Reader provides Skimming Detection for magnetic stripe card users, which has mitigated costs associated with skimming at over 10,000 ATM Lobby/Vestibule installations. For the purposes of ATM Lobby/Vestibule Card Entry Card Access Control, the current Magnetic Stripe and the future Contactless EMV/NFC Card Read technology shows overwhelming evidence that these technologies are best suited to provide Magnetic Stripe or Contactless EMV Card/NFC Mobile Access Control to your ATM installations. Contact EMV Chip Cards show to be *less desirable* for an Access Control solution due to the time a Contact EMV Reader takes to read a card and the possible card reader failures that may arise from debris collected on the 6 to 8 pins/sled card reader heads obstructing successful card reading of the multi contact (6 to 8 pin) EMV chip layout.



ARTICLE ON ATM WITHDRAWALS/PURCHASES VIA MOBILE APP

<u>Royal Bank of Scotland/NatWest announce that customers can now withdraw cash from an</u> <u>ATM without using their debit card:</u>

First it was contactless payments, now you don't even need a card to get cash. The cardless cash machine has become a reality after <u>Royal Bank of Scotland/NatWest</u> announced that customers can now withdraw cash from an ATM without using their debit card. The innovation, called "GetCash", allows customers to send a code via their mobile phone to someone else, such as a relative, friend or tradesman, which they can then use to withdraw cash from any RBS or NatWest ATM.

The two banks already operate an emergency cash facility, and this service is being made available to the 2.4 million people who have the RBS and NatWest banking app on their phone. Customers can request the cash on their mobile and a six-digit pin is generated. This code is entered at an ATM in the normal way, and the customer – or the recipient of the code – then withdraws the specified amount.

The most that can be taken out using the service is £100, and customers can use GetCash as many times a day as they wish, provided they don't exceed their daily withdrawal limit. "GetCash will offer customers an easy fix for lost or forgotten cards, a way to get cash quickly to family members or friends in need, or a choice of leaving their wallet at home in favour of their mobile phone," a bank spokesman said.

A number of pilots have been launched that feature the use of contactless payments:

- In New York City, MasterCard and Citibank are working with the Metropolitan Transportation Authority–which operates the NYC transit system–to conduct a contactless payment trial at subway turnstiles to pay for access directly on the train.
- Cingular Wireless, Nokia, <u>JPMorgan Chase</u>, Philips, Visa and ViVOtech recently completed a pilot in Atlanta, Georgia, where contactless payment was implemented using mobile phones powered by Near Field Communication (NFC) technology–an RF technology that is compatible with that used in American Express, MasterCard, and Visa contactless payment devices. The system was used at Philips Arena, home of Atlanta area basketball and hockey teams. According to Visa, trial participants overwhelmingly embraced the technology and expressed that the mobile device and applications significantly improved their arena experience.
- MasterCard, in partnership with Nokia and 7-Eleven, is now conducting a consumer trial in Dallas, Texas, of NFC-enabled mobile phones with MasterCard PayPass capability. Participants from the 7-Eleven Speak Out[™] wireless program will get NFC-enabled Nokia 3220 mobile phones and instructions on how to wirelessly enhance them with MasterCard PayPass payment functionality. The phones can then be used to make purchases at any of the merchant locations worldwide that accept MasterCard PayPass.

Source: http://www.smartcardalliance.org/publications-contactless-payments-what-who-why/