MIFARE Cards: Figure it out

Having resolved to upgrade to a MIFARE card, there is still one decision left to make. With a variety of blank MIFARE Cards on the market, it can be confusing to decide which is the most appropriate for your needs. This can vary from industry to industry, and is dependent on requirements for quantity, security and capacity for stored data. To make it as easy as possible for you to choose the right product we have created this helpful guide with everything you need to know.

Let's start by explaining exactly what a MIFARE Card is.

Mifare is a 13.56 MHZ contactless card technology which is owned by Phillips. All MIFARE cards comply with the ISO14443A industry standard requirement and are powered by an internal antenna which reacts once the card moves into a magnetic field.

Key benefits of a Mifare card?

The MIFARE Card range has a number of benefits which are listed below:

- Multiple application uses
- Enhanced security encryption makes it extremely difficult to duplicate a MIFARE card
- The MIFARE chip is not limited to cards and can be embedded into key fobs or even watches.
- Mifare cards do not need to be inserted into a reader, instead, they only need to be visible within the range of the card reader.
- Unique serial number for each card

What Can MIFARE Cards Be Used For?

- Automated fare collection system
- Staff ID Cards
- Access Management
- Campus / Student cards
- Loyalty cards (reward points)
- Tourist cards
- Micropayment (Mobile wallet, contactless payment, cashless payment)
- Road tolling
- Transport ticketing
- Event ticketing
- Mobile ticketing
- Citizen card
- Membership cards
- Parking
- Library cards
- Fuel cards
- Hotel key cards
- NFC Tag (NFC apps, MIFARE4Mobile)
- Taxi cards
- Smart meter
- Museum Access Cards
- Product Authentication
- Production control
- Health cards
- Ferry Cards
- Car rentals
- Fleet Management
- Amusement parks
- Bike rentals
- Blood donor cards
- Information services
- Interactive exhibits
- Interactive lotteries
- Password storage
- Smart advertising
- Social welfare
- Waste management

The MIFARE Family

With four families of MIFARE Cards available, the first task is to identify which type best suits these needs.

The next section of our post will look more specifically at each member of the family.

MIFARE Classic

A trailblazer in the industry, the Classic range targets those industries where a multi-use card is favourable. The Classic range is fully compliant with ISO/IEC 14443 and is available with a 1KB and 7KB memory.

Each pack of Classics is of the EV1 generation, associated with strong levels of durability and an optimal range for contactless capability. Electronic toll collection, loyalty cards and a variety of ticketing needs, from event entry to public transportation and car parking, amongst other uses, all require the degree of electrostatic discharge robustness offered by these cards. However, it is worth noting that developments in technology have rendered it inadvisable for this range of cards to host any security-relevant applications.

Target Applications for the MIFARE Classic are:

- Public transportation
- Electronic toll collection
- Loyalty cards
- Event ticketing
- Car parking

MIFARE DESFire

The DESFire, on the other hand, best serves those looking for a device that can transmit data with maximum speed and security. It is often used to offer a combination of applications; the ultimate in smart card solutions. Cards integrating the capacity to make contactless micro-payments with, for instance, a form of identification, access control, and membership, would benefit greatly from the DESFire's privacy protection and communication security.

Soon, the EV2 upgrade will also become available for this range, boasting improved flexibility in application management and data protection. Simply put, this is the most sophisticated of the MIFARE cards available, and ideal for storing sensitive information and making secure transactions.

Take a look at the video for all you need to know about the DESFire EV2

The popularity of the DESFire continues to grow and this infographic below shows the full evolution of the DESFire card since production in 2002.

Key applications for the MIFARE DESFire EV2 are:

- Advanced public transportation
- Access management
- Closed-loop micropayment
- Campus and student ID cards
- Loyalty programs

MIFARE Ultralight

With significantly less memory than the Classic and DESFire, MIFARE Ultralight cards are an ideal option for low-cost, high-volume card production. The EV1 also includes anti-counterfeit protection; it works with NXP's 'originality check' system to minimise the risk of cloning.

In terms of industry utility, therefore, they are most suitable for disposable ticketing. Sporting events, entry to exhibitions, limited use public transport tickets and loyalty cards are all appropriate uses for the Ultralight family. With reduced costs in upgrading and maintenance, they provide true value —perfect for replacing existing systems with contactless solutions.

MIFARE Plus

The MIFARE Plus has been developed to bring benchmark security to all mainstream contactless card applications. A key benefit to the Plus is that it is the only mainstream IC compatible which offers an upgrade path for existing infrastructure and services. Available in two versions users have the choice between the MIFARE Plus X and MIFARE Plus S.

The MIFARE Plus S is the standard version for straight forward migration of MIFARE Classic systems and is configured to offer high data integrity.

Key Applications for the MIFARE Plus

- Transport ticketing
- Access control
- Road tolling
- Car parking

Additional Options For A MIFARE Card

Once you've chosen the most suitable family of MIFARE cards, there are the additional options you will need to consider.

Memory

It is important to base your choice of memory capacity on the requirements of the applications you wish to upload to the card.

Simply put, the greater the complexity of the end-product, the higher the storage capacity that will be required. This is reflected in DESFire range, where greater memory options are available.

Equally, for cards intended for limited use —disposable transportation tickets, for instance—4k memory would be overkill.

Magnetic stripe

Whilst Ultralight cards are completely contactless, the Classic and DESFire families offer the option of magnetic stripes. This feature aids ease of integration - equipment is cheap and little training is required to integrate magnetic strip readers into existing services.

Add an extra layer of convenience, with proven reliability and longevity, to keep things nice and simple.

3UP

For a combination of applications that do not require the same level of protection as the DESFire, the Classic family offers the additional option of a 3-in-1 fob-solution. Suitable for integrated functionality
such as access, loyalty and cashless catering, 3UP is a great way of simplifying and uncluttering the workplace.

We hope you have gathered the information you require to make the right purchase. Don't forget as official NXP MIFARE partners we stock the complete range of MIFARE Cards which can be seen on our website or to speak to a member of the team please call 0800 588 4000.