

Gallagher Technology Choice



High or lower security access points, upfront and lifetime costs, access control only or multi-purpose cards...Which card and reader technology is right for my organization? What's the difference between Mifare Classic, Plus and DESFire? Why choose Mifare over 125 kHz? What are my options for encoding? Should I migrate to smartcard? What's the best way to do it?

The range of considerations is significant when implementing access control for the first time or migrating from one technology to another, but a step by step approach will enable you to make an informed decision that's right for your business.

Gallagher offers a range of options to suit different sites, varying in cost, security levels and interoperability among many other considerations.

There are numerous factors to consider when choosing a card technology. Each site has different needs and priorities.

Questions to Ask When Choosing a Card Technology

Below is an overview of things to think about, to help you choose the right card technology for your organization.

> Security

- Does the card technology protect against the latest card hacking threats?
- Is card security an important issue for my site?

> Cost

- How much do I want to pay for my cards?

> Availability

- Do I have choices on who I buy my cards from to ensure a competitive price / alternate supply options?

> Read Range

- Is the distance the card is read by the reader a concern for my site's cardholders?

> Future proofing

- Is the card technology at an early stage in its life cycle (i.e. likely to become more popular, reduce in cost per card) or nearing the end of its life cycle (i.e. may become harder to source / increase in price / become susceptible to attack)?

> Card Reader support

- What card readers support the technology?
- Are these readers likely to be available in the future when upgrading my site?
- Are there multi-technology reader options available to help me migrate from my existing cards to a new card technology?

Card security is only as good as the weakest link in the chain. Gallagher readers support a wide range of technologies and protect the card data between the reader and controller.

> Interoperability

- Do I want to store information on the card for use by other applications?
- Is the card technology supported by third party products with which I also wish to use the card (e.g. photocopiers, wire-free locks, vending systems etc.)

> Card Encoding

- Which applications support encoding data onto the chosen card technology?
- Do I want a third party to encode these cards/do they have the ability to encode using this technology?

Gallagher provides options for customers to encode their own cards on all supported card technologies, or to have these supplied pre-encoded.

> Physical transponder options

- Does the card technology and associated reader support keyfobs/tags, or is it available with multi-technology cards?

Contact your Gallagher Channel Partner or a Gallagher Business Development Manager to discuss your specific needs in detail.

Key Technology Benefits

Different technologies provide different benefits:

Mifare Classic

- > Widespread usage
- > Interoperability with other systems (eg photocopiers, vending machines, mass transit systems)
- > Low cost

Mifare Plus

- > Same security benefits as DESFire
 - X Card
- > Independently verified/tested
 - EAL4
- > Site specific keys
- > Greater future proofing

Mifare DESFire EV1

- > More established than Mifare Plus
- > Latest card security
 - Independently verified/tested
 - EAL4
- > Site specific keys
- > Greater future proofing
- > Medium cost

125kHz

- > Great read range
- > Low cost
- > Historically widely popular format

GALLAGHER T10 READER



GALLAGHER T11 READER



GALLAGHER T12 READER



Gallagher Card Technology Options

Gallagher supports the Mifare contactless smartcard range for the following reasons:

- > Mifare contactless chips are manufactured by NXP, and are the most popular contactless smartcards for physical access smartcard worldwide
- > Mifare contactless smartcards provide an increased level of card security than previous generation access cards
- > Mifare contactless smartcards can be used by multiple applications, allowing them to be read by different systems on a site, or to be used between different sites.
- > Mifare smartcards are produced by a wide variety of card manufacturers, providing a contestable and resilient supply chain for the cards.

Gallagher supports three variants of the Mifare smartcard in the latest Gallagher T series range of card readers, Mifare Classic, Plus and DESFire EV1. This provides an easy upgrade path for sites wishing to migrate from Mifare Classic to the newer Mifare card technologies in the future ie. future proofing.

Mifare Classic

Mifare Classic is a contactless smartcard technology that was developed in 1994 by NXP. Mifare Classic is the world's most popular smartcard for physical access control.

- > Key benefits:
 - Widespread popularity means that the format is supported by many different systems, delivering interoperability benefits
 - The cost of Mifare Classic cards are low compared to other smartcard technologies
 - Mifare Classic provides a modicum of security beyond that of earlier generation access cards, however, more recent contactless smartcards better protect against the latest card hacking attacks. Gallagher provides the option to implement a Mifare Enhanced Security mode for Mifare Classic cards, which can help protect these cards from card cloning attempts.

Mifare DESFire

Mifare DESFire is a high security contactless smartcard, developed in 2002 by NXP. Gallagher T series readers support the latest version of DESFire, EV1 (Evolution 1).

- > Key benefits:
 - Secures against the latest card hacking attacks. Card security independently verified by independent University research teams, and certified to the Common Criteria EAL4+ for security correctness and robustness by independently certified testing.
 - Established card technology means more likelihood of interoperability with other systems
 - Flexible card applications structure, which may be beneficial for third party applications stored on the card
 - Gallagher allows customers using Mifare DESFire EV1 cards to set site specific keys, so the customer maintains sole full control of their system security keys.



Mifare Plus

Mifare Plus is a high security contactless smartcard, developed in 2008 ago by NXP. Gallagher T series readers support the latest version of Mifare Plus encoded to Security Level 3 (the highest level of Mifare Plus card security).

> Key benefits:

- Secures against the latest card hacking attacks. Card security independently verified by independent University research teams, and certified to the Common Criteria
- Card data is stored in a similar manner to Mifare Classic cards, allowing easier migration of third party Mifare Classic card applications to Mifare Plus

- ‘S’ card variant provides standard high security features, expert ‘X’ card variant provides advanced card data privacy and attack protection
- Cards are available at a mid-range price, providing high card security for a reasonable cost
- Gallagher allows customers using Mifare Plus cards to set site specific keys, so the customer maintains sole full control of their system security keys.

125kHz Contactless Cards

125kHz contactless card technology has been widely used for physical access control applications for the past 20 years.

> Key benefits:

- 125kHz card technology provides a very good read range, longer than contactless smartcards
- 125Khz cards are available at a low cost per card, providing very affordable card access control
- Several Gallagher T series readers are available in 125kHz / Mifare Multi Technology variants, providing sites using 125kHz cards with an easy future upgrade path.

CARD TECHNOLOGY MATRIX

	Security	Cost	Interoperability	Flexibility	Read Range
Mifare Classic	Medium	Low	High	Medium	Medium
Mifare DESFire EV1	High	High	Medium	High	Low
Mifare Plus	High	Medium	Medium	Medium	Low
125 kHz	Low	Low	Low	Low	High

Migrating To Smartcard Technology

Why should I consider migrating from non-smartcard technologies to Mifare Plus or DESFire?

The introduction of Mifare Plus and DESFire card technology allows sites using older card types to leap a generation of smartcard technology, and gain the benefits of the latest in physical access card security. Additionally, Gallagher provides a multi technology version the Gallagher T11 and T12 card readers, allowing sites using 125kHz cards to replace their readers, then gradually replace their 125kHz cards with Mifare Plus or DESFire cards.

How can I move to Mifare Technology?

If you are a Gallagher customer, with Gallagher non-Mifare access readers – you can now trade selected readers in for Mifare readers. If you have readers of any of the technologies listed below, Gallagher has a special trade-in offer for replacing these with Mifare technology:

- > Cardax III
- > Cardax IV Smart Swipe
- > Cardax Magnetic Swipe
- > Cardax (TIRIS)

To find about our offer, please contact your Gallagher Certified Channel Partner or a Gallagher Business Development Manager.

Migrating from Mifare Classic to Mifare Plus or DESFire card technology

Mifare Classic smartcards, produced by NXP, are the most popular smartcards used for physical access control worldwide. Gallagher Mifare card technology has been historically based on the Mifare Classic card format. Recently, Mifare Classic cards have become susceptible to attack due to advances in encryption cracking and cloning techniques. NXP have produced new Mifare formats to thwart these attacks, and future-proof the card and reader investments of Mifare technology users. With the release of the Gallagher T series reader range, Gallagher supports two of these new formats: Mifare Plus and Mifare DESFire EV1. Customers currently using Mifare Classic card technology should consider upgrading firstly their readers, then their cards, to the more secure Mifare Plus or DESFire card technologies.

Best Practice Migration of Card Technologies and Readers

If you want to migrate to the Gallagher T series readers and Mifare Plus / DESFire EV1 cards you should replace your readers first, then your cards. You can then gradually install new Gallagher readers while continuing to use your existing Mifare Classic or 125 kHz cards, due to the multiple technology support of Gallagher's T10, T11 and T12 readers. Once all readers have been changed over, you can then gradually swap out your old cards for Mifare Plus or DESFire EV1 cards.

Please refer to Gallagher's Cards, Keyfobs & Encoding datasheet for information on Gallagher card technologies and encoding options available.

Technical Considerations

The Gallagher T10, T11 and T12 readers can accept both high security cards (Mifare Plus, DESFire) and the older Mifare Classic and 125 kHz cards. Once I change all my cards to high security ones, how do I stop the older, lower security cards working on my readers?

The ability to enforce only the acceptance of high security cards (Mifare Plus and DESFire EV1 cards) will be supported in Command Centre v7.00 onwards, scheduled release Q4, 2011. A reader selection will be available in Command Centre for high security card acceptance only, which will automatically stop the reader accepting Mifare Classic and 125 kHz cards. To help sites ensure they have not missed any readers and left a potential security hole, the Find Tool will also be updated to allow searches on readers that still allow access via the older, lower security card types.

I want to move to Mifare Plus / DESFire card technology, but I have a card printer / third party reader / other product I plan to keep that does not support the new technology. What can I do?

Third party hardware may be able to be upgraded to support Mifare Plus or DESFire EV1 cards, or may need to be replaced. Please contact your third party product supplier for their plans on supporting these increasingly popular card technologies. Please also note that some product suppliers may claim Mifare Plus support, but only support at the SL1 level (i.e. Mifare Classic emulation), rather than the full SL3 support, required for Mifare Plus Gallagher installations.

For third party products supplied by Gallagher, please contact your Gallagher Business Development Manager or Technical Account Manager. While

some third party products may support Mifare Plus / DESFire EV1, please be aware that additional work in Gallagher Command Centre encoding may be required to support encoding third party card data.

Where can I go for further information and advice?

For more information and assistance in making your decision about reader and card technologies please contact your Gallagher Certified Partner or a Gallagher Business Development Manager.

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