

Mifare® 1K, 4K and DESFire cards and tags



Mifare® card in ISO 7810 size & Mifare® proximity tag

Mifare® technology

When fast transport of large amounts of data, a high security level for the stored information and multiple applications on a single card or tag are required, Mifare® is the technology of choice. Integrated Engineering offers the following types of Mifare® cards and tags:

- Mifare® classic with 1K memory;
- Mifare® classic with 4K memory;
- Mifare® DESFire.

ISO 14443

Mifare® is an implementation of the ISO 14443A standard for contact less smartcards. Mifare® classic complies with level 3 of the ISO 14443A standard, DESFire complies with level 4 of this standard. For this reason, Mifare® cards can be read with every ISO 14443A compliant contact-less smartcard reader.

Mifare® classic features

Mifare® classic is characterised by its high data transaction speed. The Mifare® chip contains 16 or 40 separate sectors for storing information (depending on card memory). The first sector is typically used for storing directory information. The remaining sectors can be used for storing for instance access control or balance information. As each sector is locked with its own security keys, each sector can be used for a different application. The advanced security features prevent unauthorised reading of card data, brute force attacks and record and playback of transmitted data. Because of this Mifare® is exceptionally suitable for payment applications.

What is DES?

DES stands for Data Encryption Standard. It is a widely used, secure standard to encrypt data. 3DES ('triple DES') applies the same algorithm three times making it even more secure. DES encryption is commonly used for data that is stored or sent over a line or through the air.

Multifunctional

One and the same card can be applied for several applications; the number of applications depends on the type of Mifare® transponder. A few examples are: access control, time and attendance, vending machines, paid parking, public transport, loyalty schemes and the storage of biometrics data.

Mifare® DESFire features

Featuring DES and 3DES encryption on all data traffic, Mifare® DESFire adds even more security to your application. An unique feature of DESFire is the flexible file system, allowing more efficient use of the card's 4K of memory. One DESFire card can hold data for 28 different applications. Each application can hold 14 files, each file with its own security key.

Cards

Integrated Engineering's Mifare® cards comply with the ISO 7810 credit card size. The cards are of course very suitable for printing with text, a logo and/or a photo. If required the cards can be supplied with a HiCo magnetic stripe on the backside of the card.

Tags

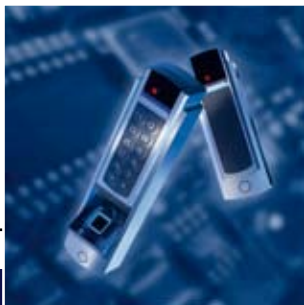
The small size of the Mifare® transponder permits it to be used into tags. The black epoxy tags are very robust and have the advantage that they can be worn on a key ring. The tags are only available as Mifare® classic. Various other shapes and sizes are available upon demand.

Long lifecycle

As a result of contactless reading and writing the chances of failure due to wear are very limited. The applied CMOS technology of the card and tag transponder ensures 100.000 writing cycles and a 10-year data retention under normal operating conditions.

Readers

Integrated Engineering offers a range of different readers for Mifare® and DESFire cards and tags. Please contact us if you wish to know more about our ISO 14443A compliant readers.



Mifare® classic family		Mifare® DESFire	
1K card	1K tag	4K card	4K card

Memory

EEPROM size	1 kByte	4 kByte	4 kByte
Memory organisation	16 sectors of 64 bytes	32 sectors of 64 bytes 8 sectors of 256 bytes	flexible file system
Max. number of applications	15	38	28
Number of keys per appl.	2	2	14
Access conditions	per sector	per sector	per file
Multi application	supports MAD*	supports MAD2*	supports MAD3*

Other features

Unique serial number	4 bytes	4 bytes	7 bytes, cascaded
Random Number Generator	YES	YES	yes, according to FIPS 140-2
Mifare® classic security	YES	YES	
DES & DES3 security			MACing / Encipherment

Interface

Compliance	ISO 14443A-3	ISO 14443A-3	ISO 14443A-4
Operating frequency	13.56 MHz	13.56 MHz	13.56 MHz
Communication speed	106 kbit/s	106 kbit/s	106 to 424 kbit/s
Reading distance (contactless interface)	up to 100 mm (3.94 inch), antenna dependent	up to 100 mm (3.94 inch), antenna dependent	up to 100 mm (3.94 inch), antenna dependent
Transaction time	164 ms	140 ms	105 ms

Physical

Temperature range	-35 - 50 °C -31 - 122 °F	-40 - 85 °C -40 - 185 °F	-35 - 50 °C -31 - 122 °F	-35 - 50 °C -31 - 122 °F
Relative humidity	10 - 90%	10 - 90%	10 - 90%	10 - 90%
Size	ISO 7810: 85.6 × 54 × 0.76 mm	31,5 × 24.5 × 1.5 mm	ISO 7810: 85.6 × 54 × 0.76 mm	ISO 7810: 85.6 × 54 × 0.76 mm
Life cycle	100.000 writing cycles, with 10-year data retention under normal operating temperature conditions.			
Material	PVC	Epoxy EP 121	PVC	PVC
Color	white, glossy	black	white, glossy	white, glossy
Suitable for printing / Photo ID	YES		YES	YES
Optional HiCo 3800 öerstedt Magstripe	YES		YES	YES

*MAD: Mifare® Application Directory.

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