

CONTACT + CONTACTLESS

OVERVIEW SMART CARDS

SMART CARDS

A smart card, or chip card, is defined as any pocket-sized card with embedded integrated circuits.

CONTACT SMART CARDS

Contact Smart Cards have a **chip** with small gold contacts on the top of it, about 1.5 cm in diameter. When inserted into a reader, the chip makes contact with electrical connectors that can read information from the chip and write information back. The cards do not contain batteries, as energy is supplied by the card reader. They are ISO/IEC 7816 and ISO/IEC 7810 regulated. These standards essentially refer to physical and mechanical characteristics, the position of the chip, the protocols used and the rules for initialising and encoding the card.

Contact Cards subdivide in **2 main categories** each with completely different features:

- * **Microprocessor Cards**
- * **Memory Cards**

Microprocessor Cards

These cards can be compared to a small desktop computer, not only capable of storing data, but also of processing information. Besides the EEPROM, other secure devices and encryption logic units, these cards feature an embedded microprocessor, a real operative system dedicated to elaborating data and implementing a file system. Microprocessor Cards offer therefore the possibility to manage simple operations of writing and reading, and also a wide range of commands for the access to the memory. Furthermore, several customers' applications can run on it, adapting to specific uses.

It is like a PC in your wallet!

Memory Cards

A Memory Card is a data storage device. It is just like a floppy disk or an hard disk on which it is possible to store data. Memory Cards can just be read or written, but cannot process information as the cards with microprocessor.

Different kind of memories for storing your data:

Free Memory

not protected by a pin - or password, for any operation of writing or reading. Anybody can write and read the stored data. This device is basically made up by a simple non-volatile memory (EEPROM)

Protect Memory

protected by a pin - or password, for any operation of reading and/or writing. The pin prevent any unauthorized access to the stored data. Protect memories are basically made up by an EEPROM and a Password Verification Unit.

Crypto Memory

protected by a pin - or password, just as a protect memory, but it's the most safe memory device as the information to be stored, first is ciphered by a crypto logic unit and then is written on the EEPROM. Crypto memories are basically made up by an EEPROM, a Password Verification Unit and an Authentication Encryption Unit.

TYPICAL APPLICATION

CARDS WITH HIGH SECURITY FEATURES

CARD

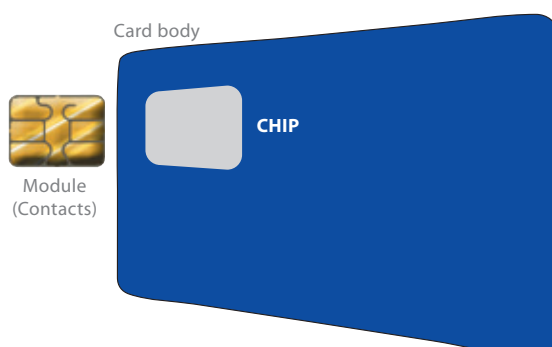
PVC, PVC ABS, PET, PET-G, LAMINATED OR MONOLAYER

ISO 7810 STANDARD CARD SIZE

CHIP POSITION AND ENCODING ACCORDING TO ISO 7816

TYPICAL APPLICATION

LOYALTY CARDS



DUAL INTERFACE SMART CARDS

This kind of card features just one chip that has both a contact interface and a contactless one. This means that the chip can be accessed either through an antenna *contactless*, or through electrical contacts *contact*.

CONTACTLESS SMART CARDS

The second main group of Smart Cards is represented by the contactless ones. These cards use a **transponder** (chip + antenna) communicating with the card reader through RFID induction technology (Radio Frequency at data rates of 26 to 848 kbit/s). These cards require only close proximity to an antenna to complete transactions. They are often used when transactions must be processed quickly or hands-free, such as on mass transit systems, where smart cards can be used without even removing them from a wallet. Contactless Cards subdivide in **2 main categories** on the base of the frequencies mostly used by the transponders:

- * **LOW Frequency Cards 125 KHz**
- * **HIGH Frequency Cards 13,56 Mhz**

LOW Frequency Cards
125 KHz Contactless Cards basically feature a transponder that either is made up by a memory that can only be read (**Read Only RO**), or by a memory that can be both read and written (**Read&Write RW**).

HIGH Frequency Cards
13,56 Mhz Contactless Cards essentially differentiate from the 125 KHz cards in the range of functioning distance and in the memory capacity. Compared to Low Frequency Smart Cards, the High Frequency ones typically have more memory capacity and either allow a faster data transfer (ISO 14443), or work at a greater operating distance (ISO 15693):

TYPICAL APPLICATION

ACCESS CONTROL

CARD

PVC, PVC ABS, LAMINATED

ISO 7810 STANDARD CARD SIZE

CARD THICKNESS 0,79 ÷ 0,84 MM

CONTACTLESS LIGHT CARD

TYPICAL APPLICATION

HANDS-FREE ACCESS CONTROL

Proximity Cards ISO 14443
ISO 14443 is the international standard that defines the characteristics (communication protocol, modulation methods, encoding schemes) of this kind of cards. In this family, **MIFARE** transponders are worldwide known and the most widely used to be embedded in contactless smart cards. Thanks to their low cost and reliability, these cards are widely used for electronic wallet, security access control, payment system, transportation or stadium ticketing.
Operating distance: up to 10cm
Transaction time: < 100ms

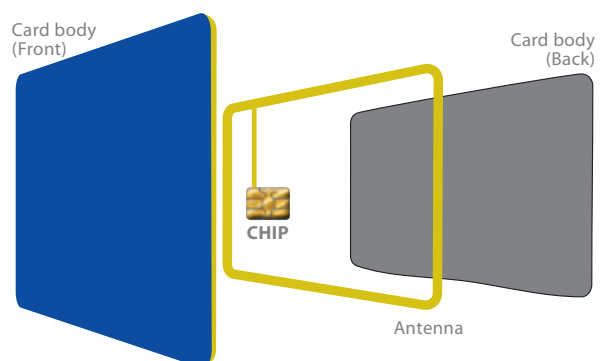
Vicinity Cards ISO 15693
ISO 15693 is the international standard that defines the characteristics of the Vicinity Cards. These cards can be read from a greater distance if compared with Proximity Cards, and are ideal for large scale access control. Designed to serve mass markets with many millions of labels needed per year, **NXP** (founded by **Philips**) Semiconductors' **1-CODE** ICs represent the state-of-the-art in 15693 technology, offering a low-cost, reprogrammable and disposable solution for source tagging, automatic data capture, theft protection and data storage.
Operating distance: up to 1,5 m
Transaction time: < 300ms

LEGIC
Everybody knows that a system with an absolute security cannot be realized. Anyway, bypassing the security features of LEGIC system is almost impossible. LEGIC systems feature the most safe security devices today available on the market, and are therefore mainly used for applications such as strict access control.

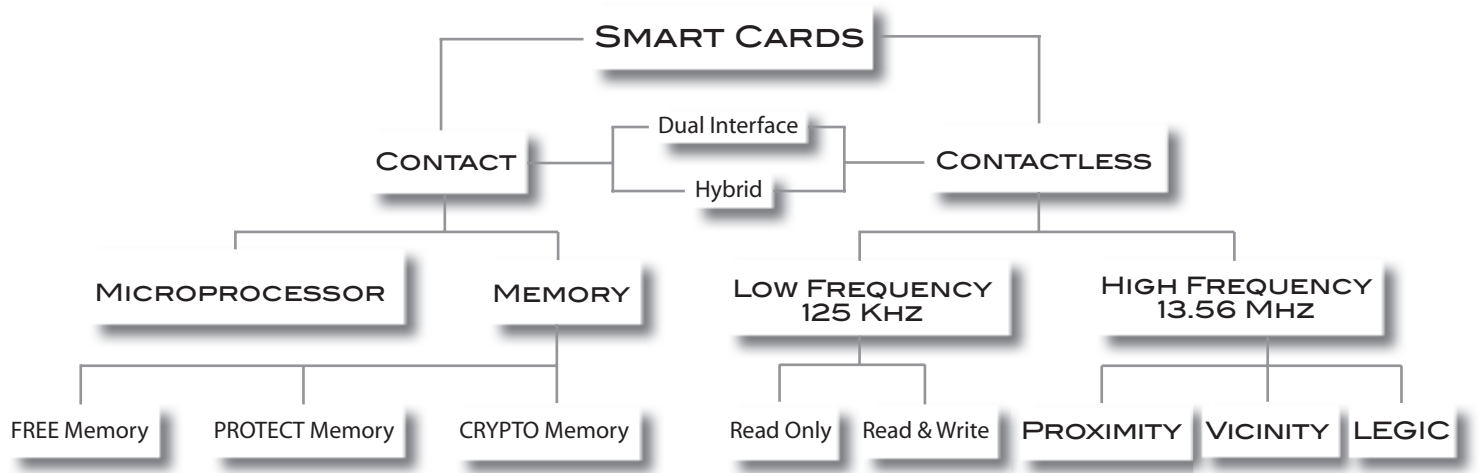


HYBRID SMART CARDS

This kind of card has got both a transponder (chip + antenna) and a contact chip on the same body. It is possible to have also more transponders and more contact chips on the same body.



SMART CARD WORLD



Please, contact our Sales Department for complete information about all the smart card types available

...A WORLD OF SERVICES

PRINT

Offset and / or screen print.

PERSONALIZATION

Thermal transfer, ink jet, embossing, tipping, hologram, mag stripe encoding, memory personalization, signature panel, scratch off label / panel.

PACKAGING & FULFILMENT

Single card wrapping with customized or standard transparent flow pack, bag chain; customized card supports, card affixing and mailing.



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