

## What is Near Field Communication?

For many years traditional plastic cards have been used to both identify the cardholder and manage entitlements. Over time, the cards became more sophisticated primarily to address security issues. This resulted in the development of smart cards, which incorporated a secure module or chip.

There are several degrees of sophistication regarding this embedded chip, from basic memory up to multi-processor modules. Regardless of the actual chip that may reside within a smart card, there are two methods of terminal-to-card communications, they are:

**Contact:** The card is inserted into a reader, which makes a physical connection with the chip via the rectangular contact plate visible on all contact smart cards. A small DC voltage then powers the chip and enables secure terminal-to-card communications to commence.

**Contactless:** The card is placed within five centimetres of a terminal that emits a short wave radio signal; this powers the chip by induction, which enables secure terminal-to-card communication. The dominant protocol in this type of smart card is MiFare.

In recent years, smart cards have proliferated. They are used in many different transaction types from financial to promotional. Smart cards have come to be regarded as a secure media or token, albeit that most applications are variations on a theme of either ID or entitlement.

Near Field Communication (NFC) is a connectivity technology that allows contactless interconnection among devices within a range of approximately 10 to 20 centimetres. Fast and easy operations, together with a high security level, make the technology suitable for secure communications such as monetary transactions, data collection, ticketing and generic information exchanges.

NFC opens up a new world of convenience for the public, whereby their NFC enabled phone or tablet can carry out a range of secure transactions simply by having a resident application (financial, promotional, membership etc.), and the means to communicate with a wealth of new devices using the NFC protocol.

The technology deployed in Near Field Communication enabled devices is very similar to the MiFare communications protocol as used in contactless smart cards. The mobile phone will be the intelligent terminal or 'initiator' They will communicate either with other 'initiators' (active mode) or with relatively basic devices with antennae such as tags, stickers or key fobs. These are known as 'targets' (passive mode).

## *Passive mode*

As with MiFare, the NFC enabled devices operate using short wave wireless, which generates an inductive RF field sufficient to power the passive device or “target”. Once the target ID or content is read, an application can be triggered within the “initiator” to activate a reward, check an entitlement, or verify an ID.



## *Active mode*

This is normally a peer-to-peer mode between two NFC enabled devices. Both 'initiator' NFC devices communicate by alternately generating their own fields. One initiator deactivates its RF field while it is waiting for data from the other initiator. In this mode, both devices typically have built-in power and the RF field is the communication medium. Active mode will be used for more sophisticated transactions, such as a monetary exchange or contactless payment, which would require both devices to have embedded intelligence.



The advantages of Near Field over 'Bluetooth' is that it has a faster set up time when communicating and uses significantly less power. NFC's main advantage is its intrinsic security level, ensured by the limited communication range of the technology that, together with a single point-to-point connection, will limit any interception possibilities. On top of the intrinsic security, NFC technology supports advanced coding methods, which makes NFC-based systems suitable for financial and other kinds of secure transactions.