



INTERNATIONAL

Ecma/TC32-TG19/2005/013  
(supersedes 2004/028)

## Near field communication (NFC)



- Easy to use wireless communication interface for the last few centimeters
- Easy to use target selection, by simply holding two devices close to each other

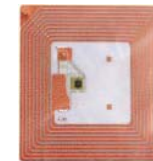
**NFC is as easy as....**



**... a touch**

## Wireless Short Range Communication Technology

- *Based on RFID technology at 13,56 MHz*
- *Operating distance typical up to 10 cm*
- *Compatible with today's field proven contactless RFID technology*
- *Data exchange rate today up to 424 kilobits/s*



RFID object



## Wireless short range communication technology

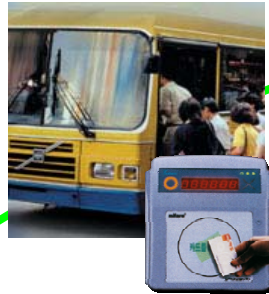
- *NFC is designed for short distance wireless communication*
- *Allows intuitive initialization of wireless networks*
- *NFC is complementary to Bluetooth and 802.11 with their long distance capabilities*
- *NFC also works in dirty environment*
- *NFC does not require line of sight*
- *Easy and simple connection method*
- *Provides communication method to non-self powered devices*



# Near Field Communication Applications

## Smart Key

- for mobile local payment



Peer to Peer communication,  
Virtual Connector

- either directly or by establishing wireless links



Low cost solution to  
distribute info / services  
-e.g. by passive loops  
embedded in paper media

NFC enables a unique blend of valued applications

## ECMA-340: NFCIP-1 Interface and protocol (ISO/IEC 18092)

### Key points:

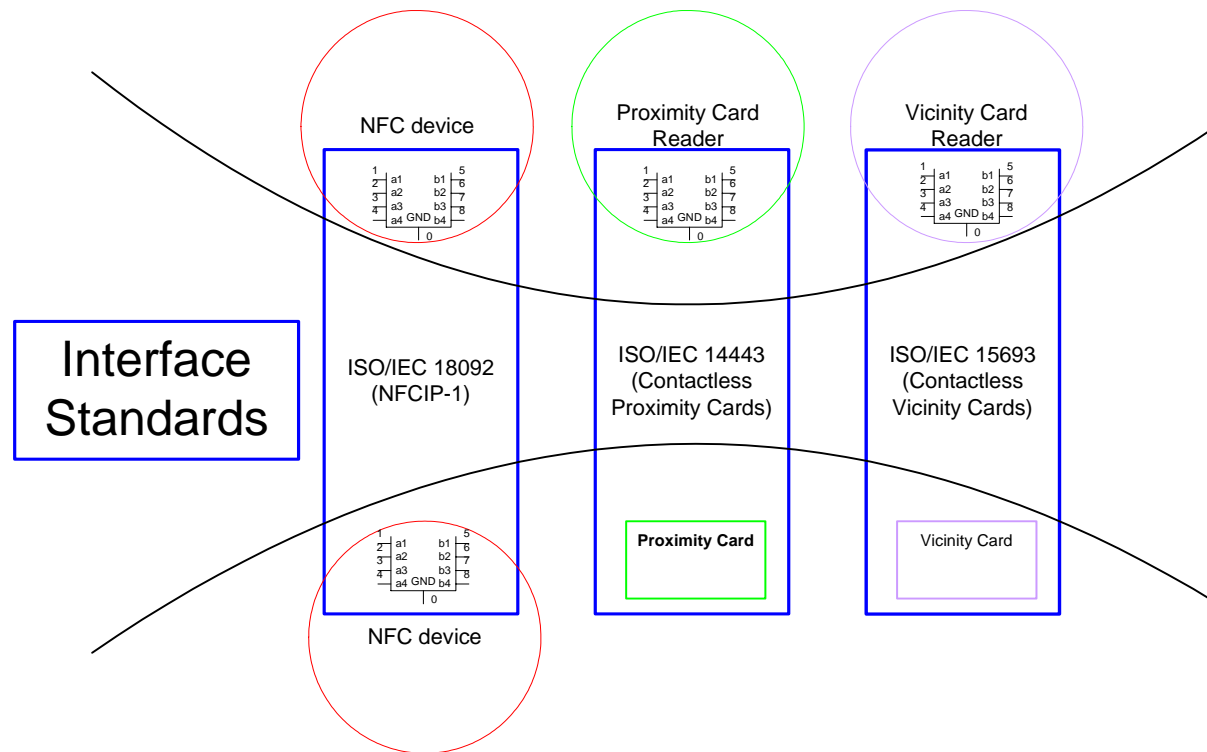
- *The NFC communication is based on an inductive RF link on 13.56 MHz*
- *Active and passive NFC mode at different transfer speeds from 106 to 424 kbps*
- *Backward compatibility with RFID systems*
- *Allows communication between*
  - **Two powered devices**
  - **Powered and non self-powered devices**
- *Standardization of*
  - **Communication signal interface**
  - **General protocol flow**



## ECMA-352: NFCIP-2 Interface and protocol (ISO/IEC 21481)

### Key points:

- Gateway between
  - *ECMA-340*
  - *ISO/IEC 14443 PCD mode*
  - *ISO/IEC 15693 VCD mode*



## ECMA-356: NFCIP-1 – RF interface Test Methods (ISO/IEC 22536)

### Key points:

- *Basic standard to ensure interoperability on the RF interface for ECMA-340 devices*
- *Description of test equipment and procedures to perform interoperability tests on the RF interface*
- *Description of the tests to be performed on Initiator and Target side*

## ECMA-362: NFCIP-1 - Protocol Test Methods (ISO/IEC 23917)

### Key points:

- *Basic standard to ensure interoperability of ECMA-340 devices for:*
  - **the initialization**
  - **the single device detection**
  - **the transmission protocol**
- *Description of test equipment and procedures to perform tests*
- *Description of the tests to be performed on Initiator and Target side*

- *A mapping of NFC to other communication protocols including the Internet Protocol (IP), GSM and Bluetooth*
  - **Advanced Logical Link Control with addressing and segmentation support**
- *Support for Data Link and end-to-end security and key management*
- *Air-to-wired interface specification*
- *Application extensions in NFCIP-1*
  - **Power control as an example application extension**

**The following Ecma International member companies have nominated representatives to TC32-TG19:**

- *Avaya-Tenovis, Ericsson, Hitachi/Mitsubishi Electric, Hewlett Packard, Innovision, Philips, Samsung, Siemens, Sony, Texas Instruments*

**Convenor: Reinhard Meindl , Philips Semiconductors**



Rue du Rhône 114  
CH-1204 Geneva  
T: +41 22 849 6000  
F: +41 22 849 6001

[www.ecma-international.org](http://www.ecma-international.org)