



NXP IC solution for contactless limited-use tickets

Mifare[®] Ultralight

NXP MIFARE Ultralight is the perfect solution for system operators wanting to implement completely contactless automatic fare collection systems. Step-by-step, traditional low cost ticketing media are being replaced by disposable, non-reloadable contactless cards or tickets.

Key applications

- ▶ Limited-use tickets in public transport (e.g.: single trip tickets, multiple trip tickets, tourist weekend passes)
- ▶ Event ticketing (stadiums, exhibitions, leisure parks, etc.)

Key features

- ▶ 100% compatible with existing MIFARE infrastructure
- ▶ Real anti-collision supported
- ▶ Operating distance up to 10 cm
- ▶ 106 kbits/s data transfer rate
- ▶ Unique 7 byte serial number (ISO 14443A, cascade level 2)
- ▶ High data integrity – 16 bit CRC, parity per byte, bit coding, bit count check
- ▶ 512 bit EEPROM, organized in 16 pages of 4 bytes
- ▶ 32 bit one-time programmable (OTP) area
- ▶ 384 bit read / write area for user data
- ▶ Field programmable 'Read only' locking function per page
- ▶ DESFire SAM based security methods supported

Tickets based on NXP MIFARE Ultralight ICs can act as single trip tickets in public transportation networks, loyalty cards or even day passes at big events. They are the ideal replacement for conventional ticketing solutions such as paper tickets, magnetic-stripe tickets or coins.

As the usage of contactless proximity smart cards becomes more and more common, transport operators are beginning to switch to completely contactless solutions. The introduction of the new contactless MIFARE Ultralight IC for limited-use tickets will lead to a reduction of system installation and maintenance costs. Terminals will be less vulnerable to damages and mechanical failures caused by ticket jams. MIFARE Ultralight can easily be integrated into existing schemes and even standard paper ticket vending equipment can be upgraded.

In addition, this solution for low cost tickets helps transport operators to reduce fraud and the circulation of cash within the system.

As frequent travellers and commuters normally use a high end contactless smart card (e.g.: based on MIFARE DESFire) for their regular trips, MIFARE Ultralight enables occasional travellers to benefit from the same advantages. It significantly improves boarding times and helps to experience quicker travel and easier movement between buses, trains and other means of transportation.

The mechanical and electrical specifications of MIFARE Ultralight are tailored to meet the requirements of paper ticket manufacturers. Issuing smart paper tickets based on MIFARE Ultralight only requires a minor upgrade to standard Edmonson / Eurosize ticket vending terminals. This can be achieved by fitting a simple contactless reader for ticket initialization.

MIFARE Ultralight operates according to the ISO 14443A standard. Meaning cards or tickets based on MIFARE Ultralight can be used at a distance of up to 10 cm with true

anti-collision properties and without the need for a battery. Last but not least, MIFARE Ultralight is fully compatible with all existing MIFARE infrastructures and can therefore be easily integrated in current transportation schemes.

The MIFARE pedigree

NXP MIFARE interface platform is the industry standard for contactless ticketing solutions. With more than 5 million reader core components and 500 million card ICs sold, MIFARE is a proven and reliable technology, which represents the largest installed base worldwide.

Compliant with the ISO 14443A international standard, MIFARE ensures that today's infrastructure can easily be upgraded. It enables service providers to expand their transportation networks and to integrate additional services such as payment systems for taxi fares, cinema and theatre tickets, loyalty programmes, access control and parking. And all while reducing the total costs of operations.

Ultralight products

Type	Interface	Command set	ResCap
MF0ICU10	ISO 14443A	MIFARE	16.9 pF
MF0ICU11	ISO 14443A	MIFARE	50.0 pF

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