



## CASE STUDY

### Have a Safe Ride with smart paper tickets!

*In the recent years, there has been a clear trend towards the adoption of contactless technology also in limited-use environments such as Public Transportation single trip tickets, event ticketing and gift cards and vouchers. As the infrastructure acceptance of contactless cards increases over time, the adoption barriers for complete contactless implementations are reduced significantly.*

Contactless technology has substituted technologies like magnetic stripe and/or barcode due to advantages in terms of convenience and performance, but also economically solution providers and transport operators recognize the benefits of contactless technology. In a first step, contactless smartcards are used for media with long-term use. Once the penetration of contactless infrastructure increases, the cost for replacing magnetic stripe tickets is relatively low. When the infrastructure to accept contactless media is already in place, the cost to upgrade the infrastructure does not involve any changes in the hardware of contactless installations. Changes, if any, can be implemented by updating the firmware in the reader infrastructure.

All of the applications use contactless technology operating at 13.56MHz based on ISO / IEC 14443 A. The ISO / IEC 14443 Standard today is used globally in a vast number of applications, like Public Transportation, Banking and Government and ID markets.

#### Why do public transport agencies want to use contactless technologies for their ticketing applications?

When looking purely the cost of the ticket, the smart paper ticket is much more expensive than a standard magnetic stripe ticket. However, instead of considering the price of a ticket only, it is more useful to consider the total cost of ownership of a system, taking into account:

- Maintenance costs
- Operational costs
- Fraud rate
- Ticket cloning

#### Maintenance costs

Conventional magnetic stripe interface contains mechanical parts used during the ticket validation, which overtime increase the risk of part failures. The contactless technology on the other hand, creates a magnetic field which powers the IC during the ticket operation. As there is no direct contact between ticket and reader, the risk for part failures can be reduced. Examples report that the allocated amount of a maintenance budget for contact interfaces can be as high as 30% of the total maintenance budget - depending on the size of an installation.

## Operational costs

Besides the benefit of reducing maintenance cost, contactless smart paper tickets help to streamline the operation of ticketing infrastructures by increasing the transparency of how users employ a system. This can be best explained by looking at the opportunities that contactless smart paper ticketing brings to its users:

- An operator would be able to collect detailed information on the degree of capacity usage of its trains.
- A system using smart paper tickets can collect information where tickets are used based on the unique identifying number (UID) which is stored on each limited-use IC.
- Whereas the data collection possibility of traditional payment media like coins or paper tickets is close to zero, a contactless system can store at which locations the UID has been used.
- By analyzing the use patterns and by tracking the entrance and exit locations of UIDs used in the system, the operator gets a clear picture when routes are used.

The result is an optimized routing in terms of headway, number of trains, length of trains, etc. resulting in a reduced operation cost.

## Fraud

Fraud can be associated with different ways of fare evasion. When using simple paper tickets, barcode or magnetic stripe tickets, it becomes easier for fare dodgers to copy the ticket either with a color copy machine and/or a magnetic stripe reader.

Smart paper tickets help to contain the threat of fare dodging for various reasons:

First, it is difficult to copy the data from a contactless IC. Even though fare dodgers might be able to copy the design of the ticket, but copying the content of a contactless IC is a different matter. Second, the newest generation of contactless smart paper ticketing ICs further improves the safety measures when integrating new security features. These features include protected data access with 3DES, 16-bit counters and cloning protection, effectively preventing users from copying content from one ticket to another.

## Confidex and smart tickets

Since 2006 Confidex has been supplying contactless smart tickets in all continents. The uncompromised quality of the products combined with volume supply capability has made Confidex the trusted partner for the contactless system suppliers and transit agencies.

Confidex products offer contactless convenience not only for season ticket holders but also for occasional travelers. Passengers enjoy improved service, new payment options, comfortable and fast transactions without waiting in line. Passengers and visitors will experience reduced boarding times as well as the convenience of cashless payment.

## What is Confidex's latest product offering?

Confidex introduced "**Confidex Saferide**" ; contactless high security ticket in March 2009 – the world's first low cost contactless ticket equipped with standardized open crypto IC, Mifare Ultralight C. *Confidex Saferide* complements Confidex's family of Limited Use Tickets for public transport. By selecting *Confidex Saferide* operators benefit from the option to implement a cloning protection, which enables them to reduce fraud and tampering with tickets throughout their systems.

The newly implemented counter allows solution developers to tailor the limited use segment according to their needs: the solution provider can decide to implement the 16-bit counter as a transaction counter, as value counter in prepaid environments or simply as trip counter depending on the setup of each individual system.

*Confidex Saferide* increases the reliability & efficiency of different systems by increasing transparency of statistical user data. The data can be used to optimize routing and required capacity at certain hours (e.g. peak times). In the end, the data collected helps to decrease maintenance costs and operational expenses.

*Confidex Saferide* enables solution providers and Public Transport operators to extend their services to their customers based on extended memory of the Ultralight IC platform. The ticket can hold a joint application (e.g. a Park & Ride application, combining low value Transportation with different services linked to Public Transportation). Thus, the integration/expansion effort is relatively low compared to new applications and the connected revenue streams for solution providers.

## Conclusion

*Smart paper ticketing is gaining momentum for good reasons and it is the perfect fit to convert existing contactless installations to fully contactless systems and harvest the full benefits of contactless technology. By adding more security and flexibility at lower cost, smart paper ticketing can be the perfect fit for transportation operators and solution providers wanting to extend their service offerings expand their customer base and increase the cash flow.*