RFID UHF Technology – System Solution for ETC, AVI, ITS & EVR Applications – Mobility & Parking

▪ ETC: Electronic Toll Collect
▪ AVI: Parking Infrastructure
▪ ITS: Intelligent Transportation Systems
▪ EVR: Electronic Vehicle Registration

As a result of an increasing global population, it is becoming more and more difficult to live in urban areas, where space is often limited. This is also true for mobility and parking. Fortunately, the Internet of Things (IoT) acts as a solution to this limitation of living and parking spaces. Access control systems for parking lots will get smarter, thanks to a new generation of Internet of Things (IoT) gateways. The detection of vehicles is carried out by means of wireless RFID technology, which allows accurate identification of vehicles and vehicle users over a distance of several meters. For this IoT gateway purpose, respective vehicles receive a clearly identifiable RFID UHF ISO 18000-63c transponder integrated within the vehicle or in a personal ID card.

These passive transponders work without batteries and fulfil the highest security standards, such as ISO/IEC 29167-10, which is based on an AES 128bit high-security encryption. In the past, barriers were managed by a simple controller board. These can now be replaced with new IoT gateways that have already proven themselves in IoT and Industry 4.0 applications.

In order to ensure the IT security of the employed transponder data, the cooperation partners rely on UCODE DNA, the latest generation of hi-security transponders from NXP Semiconductors. The decryption takes place directly between the transponders and the Kathrein readers. These are a new kind of combined RFID reader-writer and IoT gateway, as it is called. This means that the data can be loaded directly into a Cloud and then used from there.

Car Identification Project for parking (AVI) and mobility (ETC) applications started in 2011, from Kathrein & Avnet Silica initiative to speed up RFID UHF market penetration as a cheaper and more effective solution than video and/or active tag – battery biased tags – systems. This solution is based – as main "actors" - on NXP UCODE DNA and Impinj Indy reader family. Both semiconductor suppliers are part of Avnet Silica Line card.

As a biz differentiator versus competition, Avnet Silica is working very close with EU RFID System Integrators like Tönnjes for end-customer expectations, adding Hardware team know-how into the final solution.
After many years of intensive work & cooperation, we succeeded to make this solution real & reliable, finding additional partners who support our project.

The RRU 4500, Kathrein's latest generation of RFID reader, has a read range of up to 20 metres and enables the reliable identification of vehicles in freely moving motorway traffic up to a maximum speed of 250 km/h. Tönnjes uses RFID technology in two systems: One is the IDePLATE®, a vehicle licence plate with an integrated RFID chip. The other is the IDeSTIX®, a windscreen sticker containing a data chip with an encrypted ID number.
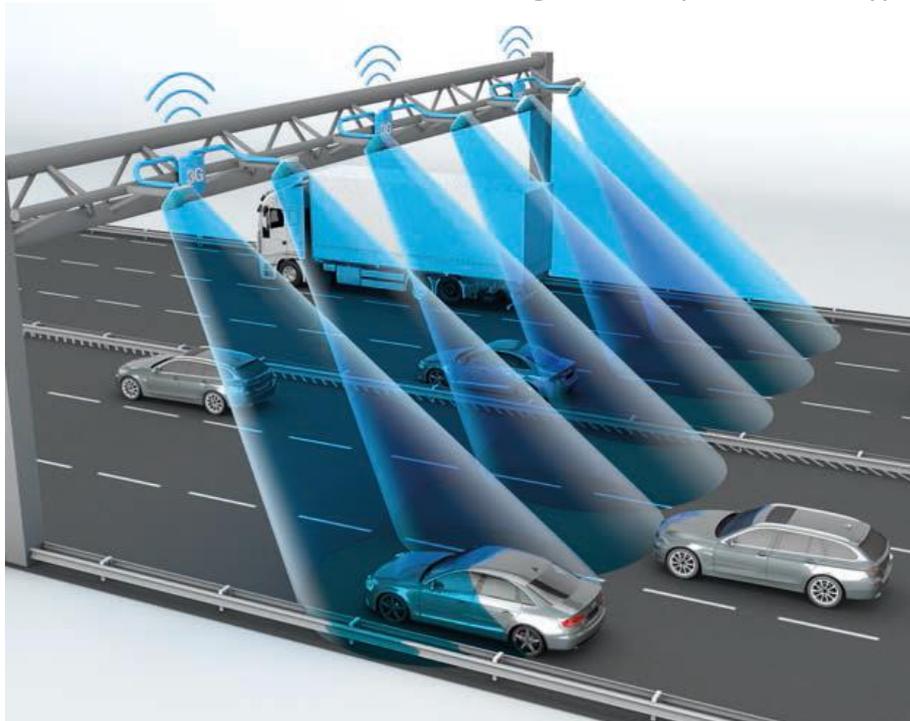
Sixt, based in Germany, operates 2,200 branches worldwide and has a total fleet of 144,000 rental vehicles. One of the key challenges for this large organization is streamlining the process of allocating cars to customers and ensuring they don't have to wait too long to get the car they want. Not only would this make the company more efficient but it would increase customer satisfaction and retention.

With the new RFID solution in place, Sixt has a much better view of exactly what cars it has in stock and the current location of the car keys. Previous to the implementation of the solution it could take up to three minutes to find a key, whereas now it only takes 20 seconds – at a busy airport branch that can deal with more than 600 rentals a day this is a huge potential time saving.

RFID readers are even installed in key trays for freshly cleaned cars. Staff at the rental office now know which cars are out, which are in and which vehicles are cleaned and ready for rental. The improved speed of service and availability of desired vehicles has already reduced the number of customer complaints by 30 per cent. Disputes about the exact time of returned vehicles have also dropped as RFID can provide accurate time information.

About Kathrein

Kathrein is a specialist for reliable, high-quality communication technologies. The company is driving innovation and technology in today's connected world. Its ability to provide solutions and services enables people all over the world to communicate, access information and use media, whether at home, at the office or on the road. The business covers a broad spectrum: from mobile communication, RFID and special solutions, to satellite reception and broadcast technology, to transmission and reception systems in vehicles. As a hidden champion and family-owned enterprise, Kathrein has been working on the technologies of tomorrow since 1919. The company takes pride in its dedicated employees and passion for customers and quality. Find out more about Kathrein at www.kathrein.com.

About J.H. Tönnjes E.A.S.T. GmbH & Co. KG

Tönnjes E.A.S.T. is a leading provider of security licence plates, offering its customers vehicle identification solutions to meet a wide range of requirements. Its RFID products, the IDePLATE (RFID licence plate) and IDeSTIX (RFID windscreen sticker), are used to protect against manipulation, fraud and theft. Equipped with state-of-the-art technology, the company develops modular systems and end-to-end solutions for the production and distribution of licence plates to meet security, organisational and logistical specifications.

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