

Case study

Turning eCharging stations into secure hubs for customer loyalty

Authors: Dariusz Kafka and Carl Fenger, LEGIC Identsystems Ltd

Contactless eCharging service ecosystem with Multi-Application Support

Summary

Thanks to LEGIC's mobile credentialing platform, Hardy Barth's eCharging stations provide end-to-end security while supporting multiple complementary customer loyalty services to make the eCharging experience even more attractive.

Delivering a customer-friendly eCharging service

In response to the EU's [strategy](#) to phase out fossil-fueled cars, the electric car market in Europe is forecast for strong growth, from 2.9 million vehicles in 2023 to over 5.5 million vehicles in 2027 (source: [Statista](#)). To service this expanding market, eCharging stations for both home and businesses will experience even faster growth, reaching 56 billion dollars by 2029, an impressive CAGR of over 30% during 2022-29 (source: [Businesswire](#)).

To facilitate this market, eCharging stations should not only support customer authentication, secure ePayment and bi-directional communication with the service provider's cloud, they must also support complementary customer-loyalty services such as discounts on eParking, mobility services, public transport, car wash, food and drink, etc. via the same branded smartcard or mobile app.

In many business cases, eCharging stations are an add-on service to existing business models that already support contactless payment such as car parks, grocery, retail and mobility rental services. This means that integrating eCharging capabilities to existing mobile or smartcard-based services must be quick, easy and seamless.

To support this growing ecosystem around eCharging stations, [eCharge Hardy Barth](#), a provider of eMobility solutions based in Germany, has partnered with LEGIC to create eCharging stations that support secure user authentication, ePayment, monitoring as well as multi-application capability that easily integrates customer loyalty services on the same smartcard or Android/iOS mobile app.



Contactless eCharging service ecosystem with Multi-Application Support

Secure & versatile thanks to LEGIC

Based on LEGIC's Security Platform, Hardy Barth's eCharging stations provide total security via end-to-end managed encryption, real-time user authentication, secure ePayment, monitoring of station status as well as supporting multiple complementary applications that make eCharging services even more attractive. The platform supports mobile app via the trusted service [LEGIC Connect](#) and smartcards which are securely managed via LEGIC's Master-Token System-Control, or [MTSC](#). Customer interaction is contactless and operates both online and offline – all interaction is done via RFID, NFC or Bluetooth between mobile app or smartcard and a [LEGIC SM-6310](#) Security Module with Secure Element embedded in each station.

Security benefits:

- Absolute security for customers based on the most secure encryption available (AES) and Secure Element for storage of encryption keys and other sensitive data
- Security ownership for mobile app integration and in-field station commissioning thanks to LEGIC Orbit's Versatile Configuration Packages (VCPs)
- VDE compliance-in preparation

- Realtime authentication of customers and maintenance staff both online and offline
- Optional two-factor as well as biometric authentication supported via mobile app
- Total security ownership during initialization and smartcard population management thanks to LEGIC's unique Master-Token System-Control ([MTSC](#)): no dependence on external parties required
- Secure management and monitoring of stations via the cloud based on encrypted wired or wireless communications

Flexibility and convenience:

- Supports smartcard as well as mobile app (Android/iOS)
- Supports up to four simultaneous and individual eCharging sessions
- Remote monitoring of eCharging status via smartphone
- Easy integration of multiple simultaneous customer-loyalty services to create an attractive service ecosystem around each eCharging station
- Open and closed loop ePayment options supported
- Convenient, contactless operation both online and offline



Getting started with LEGIC's mobile credentialing platform for eCharging applications

To enable eCharging services such as these, mobile credentials need to be easily and securely provisioned to users anytime and anywhere. Encryption keys must also be securely distributed to eCharging stations and subsequently managed from the cloud. Such a service is [LEGIC Connect](#) which now provides end-to-end mobile credentialing services to over 14 million end-users in over 200 countries.

Provided as a trusted, cloud-based Software as a Service (SaaS), LEGIC Connect creates and securely deploys mobile credentials to Android and iOS smartphones anytime and anywhere in the world. Encryption keys are also securely deployed and remotely managed at each station. Users include large companies, international hotel chains, large campuses, governments and hundreds of system integrators who leverage mobile credentials to create useful and innovative mobile-based products and services.

LEGIC Connect comprises an OWASP-ASVS audited Trusted Service hosted on AWS, a Mobile SDK to jump-start development of branded mobile apps plus LEGIC Security Modules which include an ARM processor, RF transceiver (Bluetooth, NFC, RFID) and tamper-proof Secure Element ([SM-6300](#), [SM-6310](#)). These modules are embedded in infrastructure-devices such as electronic locks, eCharging stations or IoT sensors.

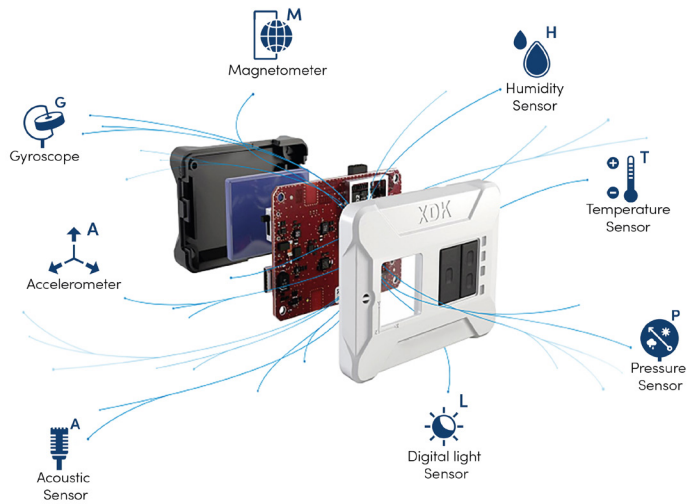
Together, these components establish a cryptographically secure, bidirectional channel from backend administration system

About LEGIC

For over 30 years, Swiss-based LEGIC IdentSystems has enabled companies from around the world to deploy solutions with demanding security requirements. Based on key management, trusted services and secure, contactless semiconductors, the LEGIC Security Platform provides end-to-end security for smartphone- and smartcard-based access, mobility, shared resource and industrial IoT applications. www.legic.com

About eCharge Hardy Barth

The Hardy Barth success story began in 1997. While still finishing his studies, the young entrepreneur founded a part-time business focused on electrical engineering services he named "Elektrohandel Hardy Barth". Three years later it became a full-time business which he renamed as "EDV- und Elektrotechnik Hardy Barth". Today, Hardy Barth is a successful engineering company located in Birgland, Germany. With over 60 employees, the company currently specializes in products and services for the IT, Building Management, Energy Systems, eMobility and ePlanning sectors. www.echarge.de



to smartphone to infrastructure. In addition to credentials, any data needing secure distribution to end devices such as firmware, cryptographic keys, whitelists or certificates can be transported via LEGIC Connect.

Jump-start designs based on mobile credentialing with LEGIC XDK

The LEGIC XDK Secure Sensor Evaluation Kit is the "The Swiss army knife of IoT solutions". It is a universal programmable sensor device & prototyping platform ideal for applications such as eCharging stations, industrial sensors, building control and logistic supply chains.

It's a toolkit containing state-of-the-art sensor technology and ready-to-use software packages. There is no need for component selection, hardware assembly, or deployment of a real-time operating system, or a development environment.

The kit comes with a wireless sensor device XDK110 to enable rapid prototyping of sensor-based products and applications. It also comes with a LEGIC Extension which enables seamless integration with

LEGIC Connect mobile credentialing platform for secure operation with Android and iOS devices. It gives users a step in-between the first hardware prototype and series production, or simply as the first compact prototype. Equipped with embedded security module with integrated Secure Element for storage of cryptographic keys/whitelists and wireless communications (RFID, NFC, Bluetooth), it enables rapid prototyping of highly secure, touchless, sensor-based products and applications while offering developers the freedom to rapidly create basic to advanced solutions.

The device includes a full array of Micro-Electromechanical sensors (MEMS: Accelerometer, Magnetometer, Gyroscope, Humidity/Temperature/Pressure, Acoustic Noise Sensor, Digital Light Sensor). The kit dimensions are: 60 mm x 42 mm x 22 mm. Weight: 43g

For more information about LEGIC XDK, visit <https://www.xdk.io/> or download the [product flyer](#).

For more information about eCharge Hardy Barth's eMobility solutions, visit: <https://www.echarge.de>