



## Partner use case

# Using SECORA™ Blockchain in a recycling and warranty & service process for electric vehicles and portable batteries

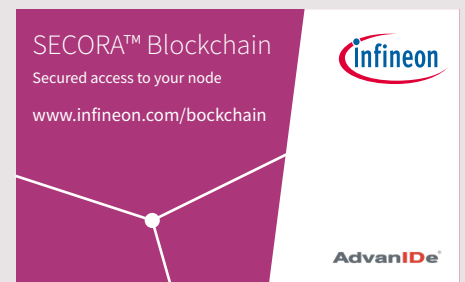


How can a customer track the life cycle of electric vehicles and portable batteries? How can a battery manufacturer enable new service concepts and bring transparency to the supply chain? A blockchain warranty process and product lifecycle can support the authentication of a product and the upselling of services to the customer.



## Products

### SECORA™ Blockchain



# Use case

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## Application context and security requirement

Blockchain is available in the market for many use cases. It helps to solve problems by closing information gaps and can securely store data of the value chain. The technology enables a full battery life cycle traceability across the supply chain, supporting responsible and efficient re-use and recycling of electric vehicles and portable electronics batteries.

Just using the serialization process in manufacturing creates only a number for each item, which is not appropriately secure and transparent for the partners and users.

Companies want to create something more useful and more secure such as tamper-resistant cryptographic seals. With such offerings companies can track the progress of a product from the manufacturer all the way to the consumer. They can verify through blockchain-based proofs where the product has moved in the supply chain.

When a product is manufactured, the manufacturer creates a record of it as a digital twin in the cloud and on the blockchain. The movement of the product is verified and recorded at each touchpoint until a consumer purchases it. This process will now be enhanced by the warranty process and life cycle management of the product in the blockchain.

When an end customer checks the product, the warranty partner or company can check the record to see if there is reliable and proven path from the manufacturer through to the consumer. If so, they have received proof of the product authenticity.

Counterfeit products can be dangerous for anyone in the supply chain. To keep them out of the supply chain benefits everyone including the manufacturer's brand and the distributor's reputation.

The service/warranty partner is protected from fraudulent claims on counterfeit items. The retailer has an additional value proposition to upsell customers on a warranty service level.

Once the supply and product identities are registered to blockchain, warranty claims can happen transparently and in just a few seconds. This saves a lot of time and costs for such a process.

## Challenge

In order to meet the above mentioned security requirements it is necessary to implement a common criteria certified integrated circuit (IC) which is more secure than a standard near field communication (NFC) IC in a label product for a service warranty and in addition to implement a recycling solution which is supported by blockchain data elements.

## Use case

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### Implementation

AdvanIDe has partnered with Verisium a well known partner in the blockchain industry to address this market need and meet the challenges.

As an ECO system partner Verisium has created an online cloud service and blockchain solution using Infineon SECORA™ Blockchain IC in different form factors such as cards, labels or tags which are powered by AdvanIDe and its customer base.

Infineon's extensive security expertise provides the layer of security required to protect private blockchain keys. The integration of hardware-based security into blockchain applications, such as tokens, hardware modules and smartcards, makes private keys much more robust against attacks. This security fundament is the base for our solution which was introduced by Verisium.

Verisium is a marketing IoT platform and has created the cloud analytics and blockchain for item handling. Regardless of sales channels and geography by embedding security ICs, NFC-chips/ quick response-codes (QR-codes) into or on products. The product life cycle and service concept can be used by any service company or original equipment manufacturer (OEM) who manufactures or sells batteries for example in automotive or portable batteries supply chains.

### User benefits

Independent on the service level, customers can check the supply chain and recorded data of the various partners through the value chain.

- › Manufacturers and their service partners can implement new service concepts to create new upselling to end customers.
- › Service level data can be stored in the cloud and blockchain such as sales data, customer service data, extended warranty, repair data, warranty, images and videos.
- › Protection against fraudulent claims or counterfeits is achieved as the manufacturing and service data is linked to the product in a more secure way.
- › Customers can gain full visibility over a battery's location, condition, health, and which metals could be recycled for use in new batteries.

# Solution



## Business process

### 1. The manufacturer embeds the smart label or tag with the battery and registers it in the system

The manufacturer has an account in the Verisium portal. The manufacturer creates a battery description and chooses a command which registers the battery in the system. After this, the manufacturer must scan the smart label or tag inside or attached to the battery. This operation binds the tag with the description. It stores the unique identifier (UID) in the blockchain, it generates a key pair in the SECORA™ Blockchain product, and saves the public key in the internal database.

### 2. The manufacturer creates accounts of the partners

Dealers and service stations authorized by the manufacturer receive access to the system.

### 3. Dealer sells an electric car or electric bicycle with the battery and the service concept

An authorized dealer enters information about a customer and registers him as a client in the system. The client's account is chosen and the SECORA™ Blockchain product is scanned. As a result, the client is bound with a particular battery and becomes the owner.

### 4. Service station adds information about the maintenance or disposal

The service stations can log into the system, add information about the maintenance, comment about battery conditions, and scan the SECORA™ Blockchain product. The added information will be linked with the battery.

### 5. The service stations or regulators get information about the battery

It is necessary to log into the system and scan the SECORA™ Blockchain product. After scanning, all information is shown. With this step the SECORA™ Blockchain product was registered in the system till the last scan.

### 6. Marketing or informational communication with the end customer

Using the analytical instruments provided by Verisium, the manufacturer or the service center communicates with the customer. Provides promo codes or invitations to events, reminds of the upcoming maintenance, etc.

## Technical details

### 1. SECORA™ Blockchain registration

We read the SECORA™ Blockchain IC as a tag or any other form factor and get the UID. We run the command to generate a key pair and get information about the public key. We save the UID in the blockchain and bind information with the public key to it. An object is also associated with the UID, which contains the entire description of the battery and all the necessary instructions.

### 2. Adding information about the maintenance

Each scan of the SECORA™ Blockchain product is a transaction that we sign using the previously generated private key and store this transaction in the database. The transaction consists of information about the scan (time, location), information about the user (account), and information that was linked by the user to the scan.

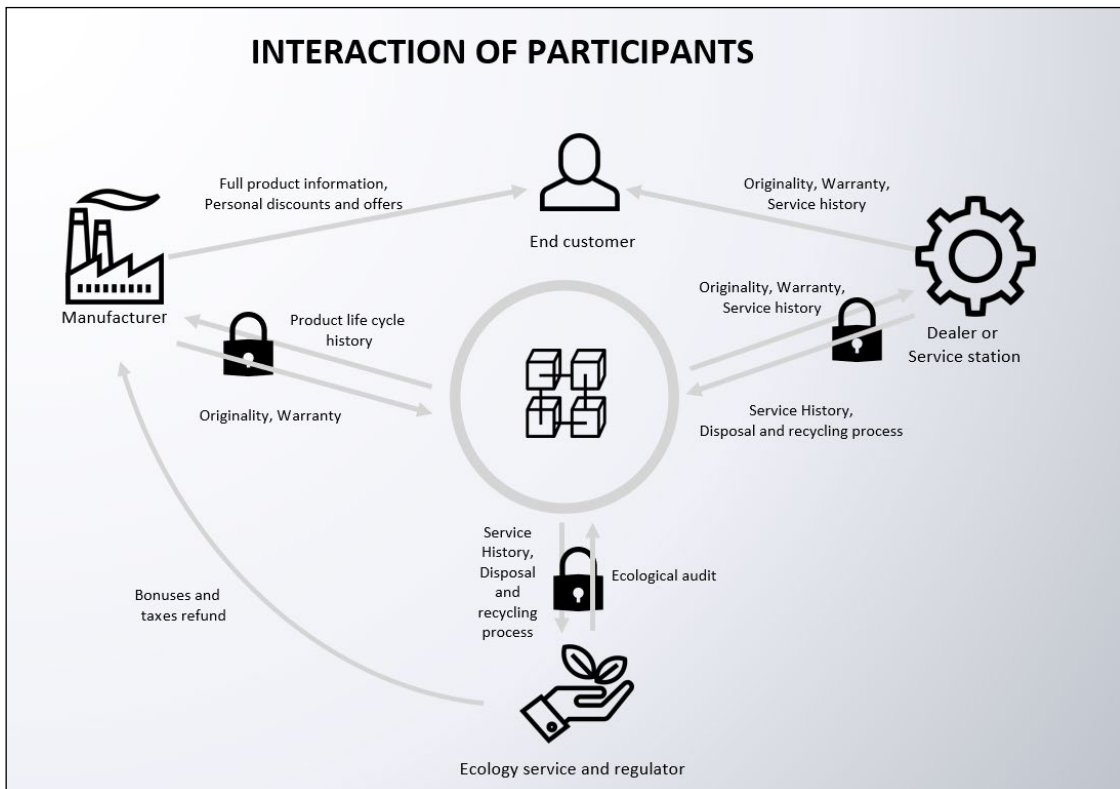
Service partners in the system are created by the manufacturer. Customers are added by the service partner. This increases control and protection against unauthorized access.

The solution is based on Ethereum instance for blockchain.

# Solution

**AdvanIDE**

	Pure NFC + Database	Blockchain Security 2GO + Verisium IOT Platform
Authentication Check	Yes	Yes, vivid
Product life cycle history	Yes, Cloud database	Yes within blockchain
Brand authentication against counterfeiting and fraud	Limited, AES encryption	Yes PKI, Private key is created in the Chip, CCEAL 6+
Protected service history	No	Yes
Customer loyalty and motivation	No	Yes, the whole platform solution including blockchain



## Main benefits of the Infineon product

SECORA™ Blockchain is a fast, easy-to-use Java Card™ solution supporting best-in-class security for blockchain system implementation. It makes the application more secure and easier to design for customer's blockchain system. By providing a safe "vault" for user credentials, SECORA™ Blockchain can reduce the final user's commercial risk and helps to increase trust in the blockchain system. SECORA™ Blockchain is common criteria certified EAL6+.

# Partner

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Partners from the Infineon Security Partner Network help you secure your devices and applications: understand which threats can undermine your business, propose solutions that will protect your business, build and implement such security solutions and, when relevant manage their operation. They have been selected by Infineon on the basis of their system security competence and ability to design and deliver strong and trustworthy security solutions. Their activities are diverse and include security consulting, security solution provision, electronic design, systems integration and trust services management. For some, offers are off-the-shelf; while for others, offers are custom-built.

## AdvanIDe

AdvanIDe – Advanced ID Electronics – is one of the leading semiconductor providers focused on components and value-added services and products that are typically being used in Radio Frequency Identification (RFID) transponders and readers, chip cards, security access modules, NFC and IoT devices. AdvanIDe works with leading card manufacturers, security and state printers, transponder manufacturers, OEMs and system-developers.

AdvanIDe has been a long-term partner of Infineon since 1996.

## AdvanIDe's contribution to the Infineon Security Partner Network

Infineon's and AdvanIDe's partnership will broaden the range of blockchain applications for both companies.

AdvanIDe's capability with consulting and bringing partners up to speed on customized antennas and form factors for any object or package as well as configuration support will help to rollout solutions efficiently.

AdvanIDe is well positioned to support with value-add products and services like wearables, industrial tags and custom labels for brand protection, service maintenance in industrial application or any other verticals.

Being a preferred security partner of Infineon, AdvanIDe will continue to focus on the secure blockchain applications within the different market verticals, and keep bringing value-added products and services with Infineon.

Published by  
Infineon Technologies AG  
81726 Munich, Germany

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Date: 02/2021

### Additional information

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