Experience the future of safe healthcare with NFC

Protect against counterfeits and enhance user experience

www.infineon.com/nfc-solutions

Combating the threat of counterfeit healthcare products

Counterfeit pharmaceutical and healthcare products may pose a serious threat to global health and safety. Not only do they undermine public trust in the healthcare system, but they also put patients at risk of receiving ineffective or even harmful products. Counterfeit medicines are often made from sub-standard or even toxic ingredients, which can lead to serious health problems or even death. The proliferation of counterfeit healthcare products also undermines efforts to treat and control diseases, such as the spread of malaria and the COVID-19 pandemic.

In today's fast-paced and complex healthcare landscape, it is critical to take proactive measures to protect against counterfeit products, check the authenticity and enable safety of every purchase.

The use of NFC (Near Field Communication) technology in healthcare can help to curb this growing problem by providing an intuitive and secure way for consumers to verify the authenticity of their purchases, and to protect against counterfeit products.

How NFC technology enhances healthcare product authentication

The utilization of NFC tags by manufacturers can enhance the authenticity, safety, and efficacy of healthcare products for patients. NFC tags can be used to authenticate prescription drugs, medical devices, nutritional supplements and diagnostic products.

An NFC tag is a small electronic device that can store data and transmit it to an NFC-enabled device, such as a smart phone or a tablet. These NFC tags can be scanned by consumers to verify the authenticity of the product.

Kick-start your NFC experience with a tap

The process to read the NFC tag is straightforward. The wayfinding mark system shows users that an item includes NFC, and guides the consumer where to tap.

According to the World Health Organization (WHO), it is estimated that up to 10% of all medical products in circulation are counterfeit. This amounts to a staggering global market worth billions of dollars, potentially putting millions of lives at risk.

1 Source: World Health Organization (WHO) (2019), "Counterfeit medical products"

10%

of all medical products in circulation are counterfeit[1]

Expanding realm of NFC applications

NFC is transforming healthcare by enabling an omnichannel experience, whilst opening up new possibilities for both the healthcare providers and consumers. It enables multiple application possibilities, which can be customized and integrated into existing applications. Below are some of the applications where NFC technology is making an impact.

Product authentication
The implementation of NFC tags can help prevent the circulation of counterfeit or expired drugs, helping patients to receive safe and effective treatments.

Medication management
NFC tags can be attached to medication bottles to provide important information, such as dosage instructions and expiration date. Patients can use their smartphones to scan the tag and access this information, improving their ability to manage their medication effectively.

Patient healthcard for controlled access to medical records
Controlling access to medical records is crucial to protect patient privacy and confidentiality, as unauthorized access can lead to legal and ethical consequences. NFC tags offer secured and efficient solution for controlling access by encoding patient identifiers and setting access control parameters. Authorized medical personnel can access medical records using an NFC-enabled reader, configured to only allow access to specific devices. This approach ensures compliance with data protection regulations such as HIPAA, protecting patient privacy and confidentiality.

Patient wristbands for accurate identification and monitoring
Patient wristbands with NFC tags stores patient information and can be read using an NFC-enabled device. They are used for accurate patient identification and in addition to monitor vital signs. By using these wristbands, healthcare providers can reduce errors, enhance patient safety, and streamline workflow.

Our OPTIGA™ Authenticate secured NFC tags (NFC4TCxxx family) provision a wide range of memory options starting from 304 bytes and scaling all the way to 4 kilobytes, to securely store data and build custom applications.

Healthcare industry benefits

Counterfeit prevention
Helping patients to receive safe and effective medications

Patient safety
Provide instructions for use, information on side effects, and any necessary precautions

Data collection
Valuable insights for research and development

Supply chain traceability
Track medicines or medical devices using the Unique ID

Patient benefits

Secured communication with healthcare providers
Safely share information such as medical history, treatment progress, and any side effects

Real-time access to information
One-tap access to important information

Easy tracking of treatments
Medication dosages and scheduling

Improved safety
Help to eliminate fake products

Secured NFC benefits the brand and the end consumer

Secured NFC tags are gaining traction across a growing number of healthcare applications as they offer many compelling advantages.

Our secured NFC tags provide the following benefits:

Clone protection and robust security
Secured NFC tags feature advanced cryptography algorithms.

Advanced anti-counterfeiting
Reliable check for product authenticity. Protection of revenues thanks to easy identification of product sales in unauthorized markets.

Enhanced user experience
NFC tags are intuitive – all the consumer needs to do is tap the product with their phone to read the tag and authenticate their purchase.

Unobtrusive design
NFC can easily and subtly be embedded into the brand graphics or packaging so the technology has no impact on the brand esthetics or design.

Maximise ROI by using the same chip for multiple applications
The same chip supports complementary use cases such as enabling consumer engagement or track and trace functionality along the supply chain, thus increasing return on investment.

Why secured NFC tags?
Secured NFC tags are built with a chip that enables advanced cryptography features, especially suited to the protection of high-value assets. They are particularly beneficial for healthcare brands since plain NFC tags are often easy to clone, thus compromising the brand integrity.

The entire NFC4TCxxx family of NFC tags is designed to deliver the highest levels of security, thereby instantly and reliably establishing authenticity. The NFC4TCxxx tag is built on an open standard security architecture based on AES-128 symmetric key cryptography. It provides inherent resistance to physical attacks like differential power analysis (DPA) and differential fault analysis (DFA).

Rich portfolio of NFC tags for all use cases

Infineon offers a broad portfolio of NFC tags to support different protection requirements. The tags come in varying levels of security – scaling from basic password-based tags to more secure cryptography-enabled tags.

Features:

- Contactless interface to ISO/IEC 14443 Type A, NFC Forum Type 4 Tag
- Up to 4 KB user memory for data storage
- Built-in command set based on ISO/IEC 7816-4/-9
- Fully configurable file system based on ISO/IEC 7816-4
- Certified to the CIPURSE™ open standard

So how do our NFC tags work?

Our NFC4TCxxx tags work on the principle of symmetric cryptography. The 128-bit AES master key is stored in the backend cloud server and a corresponding derived key is stored in each tag. This key is unique to each tag. Whenever the user taps the NFC app on a product featuring an NFC tag, the unique ID and an authentication command (derived from the crypto keys) are exchanged between the tag and the cloud server.

If the keys are correct, the mutual authentication process is successful and the user can read out the data from the tag. Cloned tags that do not have the correct crypto keys would result in a fail in the mutual authentication process.

Kick-start your NFC anti-counterfeit project

Our NFC2Go starter kit is designed to fast-track your standalone brand protection development project.

Kit contents and support tools:

- 8 NFC4TCxxx stickers (round and rectangular form)
- NFC verifier app: Free app available on iOS and Android store
- Infineon secured NFC tag IDE: A PC personalization tool to personalize the tags
- Backend cloud authentication software
- Sample codes available on GitHub repository

With the app and PC personalization tool, you can rapidly prototype your anti-counterfeit application by personalizing the keys and customizing the brand content. You can program the tags with your company website, product details, service information, and more. In addition, the kit allows solution providers to easily access and download the reference code for cloud deployment and smartphone app development, so they can quickly build solutions or integrate them with their own apps.

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