



## ingenico

*Ingenico is the global leader in payments acceptance solutions. Their best-in-class terminals, solutions and services enable the global ecosystem of payments acceptance. The company specializes in EMV, NFC, and hardened payments security. Their commitment to custom local solutions and strict compliance has made them the strategic partner of choice for merchants, banks, acquirers, ISVs, payment aggregators, and fintech organizations worldwide.*



### AT A GLANCE:

- ▶ 40+ years in business
- ▶ Headquartered in Paris, France
- ▶ Operates in 170 countries
- ▶ 1000 Banks and Acquires
- ▶ 40+ million terminals deployed

The terminal will have been injected with encryption keys for this purpose. The card data is then transmitted through a series of banks, payment gateways, and card networks. The merchant's processor uses a copy of the same key to decrypt the card data before sending it to the cardholder's issuing bank to authorize it for payment.

## Ingenico case study

### A partnership of complementary strengths

Ingenico began its partnership with Futurex ten years ago during a pivotal time. In its dedication to advanced payment security, and to better serve the needs of its customers, the company needed to expand its service offerings while getting ahead of emerging compliance requirements. Meeting this goal would require an enterprise key management and key injection solution that surpassed normal requirements. Ingenico was aware of Futurex and its cryptographic solutions through partnerships with mutual distributors. The two companies would form a technology partnership based upon their complementary specialties – point of sale (POS) terminal technology on Ingenico's part and encryption key management on that of Futurex.

In advance of upcoming changes to PCI PIN compliance, Futurex and Ingenico combined their expertise to develop the industry's first key injection protocol that eliminates clear-text key material. This cutting-edge technological advancement allowed the mutual customers of Ingenico and Futurex to stay ahead of the compliance curve while streamlining the key injection process. In addition, the key management solutions that Futurex brought to the partnership helped Ingenico expand its service offerings in the global payments marketplace.

## Enterprise key management

Organizations that need to secure sensitive data rely on encryption, and therefore on encryption keys. Encryption keys are created by algorithms to encrypt and decrypt data. During the payment process, encryption keys play a complex role. The process starts when someone makes a purchase with their payment card. The POS terminal captures their card data and encrypts it with an encryption key.

## Project goals

Organizations like Ingenico, which manufacture and deploy POS terminals, need a comprehensive key management platform that supports key injection for its customers. To that end, Futurex provides enterprise-grade solutions like the KMES Series 3, a dedicated key management server capable of fulfilling almost any key management use case. Even so, Futurex worked with Ingenico to develop a custom solution that would extend the KMES Series 3's functionality even further and benefit their mutual customers in new ways.

First, Ingenico wanted to support performing key injection with the KMES Series 3 to streamline customer workflows. This would require Futurex to develop a customized integration solution. Second, as a payment acceptance industry leader, Ingenico was aware that PCI PIN v3 requirements would soon require that no clear-text key material be injected into POS terminals. This change requires organizations to adopt a new process where only encrypted keys are injected. As a cryptography provider at the forefront of the industry, Futurex was up to the challenge of integrating the KMES Series 3 with Ingenico's key loading platform while developing a new key injection protocol to help mutual customers stay compliant.

## Custom development

Ingenico and Futurex would collaborate to support encrypted key injection between Futurex's KMES Series 3 and Ingenico payment terminals. An all-in-one key management and injection solution was essential to the workflow of mutual customers. This called for a customized solution.

## Fulfill emerging compliance requirements

Ingenico's goal is to provide its customers with solutions that meet the widest range of international compliance standards. To that end, Ingenico anticipated an emerging PCI PIN v3 requirement to no longer inject clear-text key material. This called for the development of a totally new key injection protocol on which both Futurex and Ingenico would collaborate.

## Meet demand for product integration

One of Ingenico's major goals was to enable its partners to take advantage of its AXIUM platform, a next-generation smart POS solution. This would require integration between AXIUM and Futurex's key management and key injection solution. Ingenico would also need to integrate Futurex technology with its line of payment terminals.

## Expand service offerings

Ingenico works closely with its customers to provide custom solutions to address their security needs. For this purpose, Ingenico sought to enable Futurex's versatile, industry-leading technology as a core tool to meet the cryptographic requirements of its mutual partners.

## Key Management Use Cases

**Key lifecycle management** is the process of creating, storing, rotating, and disposing of encryption keys. An enterprise-grade key management platform allows organizations to control and even automate these processes from a centralized platform to increase efficiency and reduce manual effort.

- ▶ Create, store, encrypt, and sign keys
- ▶ Use any major encryption key algorithm
- ▶ Automate key rotation and injection

**Payment key management** involves securing and managing encryption keys in the payment process. It primarily relies on symmetric encryption, where the same key encrypts and decrypts data. This comes into play when capturing and encryption payment data at the POS.

- ▶ Manage symmetric encryption keys
- ▶ Protect data during payment cycle
- ▶ Deploy point-to-point encryption (P2PE)

**Encrypted key injection** refers to injecting encryption keys into devices that transmit sensitive data, such as POS or POI terminals, ATMs, and IoT devices. This is an essential use case for the manufacturers, distributors, or operators of these devices, as it provides them with secure keys to protect sensitive information.

- ▶ Directly inject keys
- ▶ Deploy remote key loading (RKL)
- ▶ Automate workflow to reduce manual effort

## The Solution

As partners, Futurex and Ingenico worked together to achieve two key goals. First, Futurex customized the KMES Series 3 to support key injection. Futurex typically provides separate devices — like the SKI Series 3 — to perform key injection. However, this would have disrupted the workflow of certain mutual partners and customers. As such, Futurex modified the KMES Series 3 application to incorporate key injection functionality.

Second, Futurex's development team collaborated with Ingenico to integrate the KMES Series 3 with Ingenico's KiTBridge key loading device (KLD). The KiTBridge KLD acted as an interface between the KMES Series 3 and Ingenico payment terminals and smart POS solutions that allows encrypted keys to be injected. This was intended to bring the advanced key management capabilities of the KMES Series 3 to Ingenico's AXIUM smart POS platform, allowing its payment ecosystem customers to use a set of features consistent with the Telium TETRA physical POS terminals.

### Key loading innovation: KiTBridge and EKLA

Normally, organizations connect their key injection device to a payment terminal in a secure room and load a clear-text terminal key. However, beginning January 1st, 2023, PCI PIN v3 will require that clear-text key material no longer be injected, and that only encrypted key injection will be allowed for devices at POI v3 and higher.

Futurex's Solutions Architects collaborated with Ingenico to develop a PCI PIN compliant solution for direct key injection that is simpler, faster, and less restricted. Ingenico's KiTBridge KLD receives cryptographic commands and encrypted keys and sends them to a payment terminal over USB. This makes it easy to simply connect a Futurex key injection solution to a KiTBridge device and load keys directly to connected payment terminals.

Futurex made this possible by developing the EKLA application. EKLA is a key loading agent that runs on a laptop or on a Futurex key loading device. It receives a symmetric AES256 key from a Futurex key management solution (such as the KMES Series 3) and exchanges that key with a key loading device, in this case KiTBridge. KiTBridge then loads that key onto a payment terminal. All keys sent afterward are encrypted under the AES256 key to ensure security.



## Results

Working together, Ingenico and Futurex achieved several mutual goals. Futurex's integration with Ingenico's KiTBridge platform allowed mutual customers to implement highly scalable enterprise key management across related projects and services while staying ahead of the upcoming change to PCI PIN compliance. It also made the key injection process faster, less restrictive, and just as secure.

The integration has implications beyond the scope of this project, as well. With the EKLA application, equally streamlined key injection processes can be applied to the environments of other organizations, allowing them to see a similar range of benefits. As the EKLA application is further expanded upon, users may not need to rely on physical, on-premises key injection tools at all; instead, they can connect their payment terminal to a laptop running the EKLA application, and then connect EKLA to a key management device in Futurex's VirtuCrypt cloud over TLS to inject keys. This will further streamline the process and add an even greater degree of compliance and flexibility to enterprise key loading in general.

## Streamlined encrypted key injection

Futurex integrated its key management solutions with Ingenico's KiTBridge platform to support encrypted key loading. This delivered the highest level of security to its customers while streamlining the key injection process.

## PCI PIN v3 compliance

By developing an innovative new method of encrypted key injection, Futurex and Ingenico have given their mutual partners and customers a simple way of limiting PCI compliance. In addition, Futurex key management solutions comply with a wide range of security standards, such as PCI PTS HSM v3, PCI PIN v3, FIPS 140-2 Level 3, ANSI, and many more.

## Smooth integration with KiTBridge

Integrating Futurex's key management tools with Ingenico's KiTBridge KLD brought a range of advantages to its clients. KiTBridge is a common interface for injecting keys into Ingenico's AXIUM & TETRA POS terminal products. The integration allowed Ingenico to implement highly scalable enterprise key management across related projects and services for its customers.

## An expanding business relationship

For over ten years, Ingenico and Futurex have strengthened their working relationship. Ingenico now has multiple lines of business that use almost all of Futurex's products, from key management servers and key injection devices to hardware security modules (HSMs) and cryptographic management tools. Futurex solutions have helped Ingenico take on new use cases while scaling to meet new challenges in the international payments industry.

The partnership continues to bear fruit for both companies. In 2021, Ingenico successfully launched its AXIUM POS platform for Android – complete with key management integration from Futurex – accelerating the digital transformation of the payments sector. In 2022, Ingenico took advantage of its PCI certification to launch the fully certified Self-Modular, the world's first unattended POS modular configuration, further expanding its market verticals. As the payment sector continues to evolve, Futurex looks forward to how its partnership with Ingenico will evolve in turn.

In Ingenico's words: "We have a longstanding relationship with Futurex built on collaboration and innovation. As a technology partner, our development teams collaborate to provide one of the most simplified integrations with KiTBridge to enable our partners to embrace the AXIUM product."

## Contact Futurex

If you have any questions about this case study, or about any and all things to do with hardware-based key management, feel free to contact our team of subject matter experts for more information.

