Securing Cargo Containers Using Electronic Keys and Locks

Increase security of Cargo containers by introducing as system that:

- Replaces Mechanical Padlocks at container Lock Box with padlock equipped with electronic lock that opens with electronic key.

- Replaces Mechanical Cable Seals at container Cargo Barrier Seal with Cable Seal padlock equipped with electronic lock that opens with electronic key.

- Replaces Mechanical Seals with Padlock equipped with electronic lock that opens with electronic key.

An electronic lock system combines the benefit of mechanical operation and the security of advanced electronics.

The electronic lock system integrates RFID technology with innovative locking mechanisms managed by software.

Each electronic lock has a unique identification number.

Each electronic key has a unique identification number.

One electronic key corresponds to a specific user and can be programmed to operate multiple locks, at specified a specified date, for a specified time period, eliminating the need for multiple keys, and multiple keys can be programmed to open the same locks.

Electronic keys and Electronic locks cannot be cloned like mechanical ones can.

When the electronic key is used to open the lock, the lock will transmit events to the key whether the operation was successful or not, creating an audit trail that can be viewed within the software.

The electronic keys are programmed and read with an encoder via NFC (near field communication).

When a key is lost security is not compromised since it can be programmed to be valid only for a limited time period and can also be blacklisted to the electronic locks so that the electronic locks themselves do not allow the blacklisted key to open them.

The electronic locks is free of wires and cables, and can replace traditional mechanical locks easily due to the wide range of locks available.

The electronic locks do not contain a battery and are therefore maintenance free and can bear severe environments.

HOW IT WORKS

1. Key is inserted to provide power for the electronic lock
2. The electronic lock sends encrypted data to wake up the electronic key
3. The electronic key answers with encrypted code to the electronic lock
4. The electronic lock returns confirmation command to the electronic key
5. The electronic key sends (open, get list...) command to electronic lock
6. Electronic Lock opens

Electronic Keys communicate with data collectors (mobile phones, tablets, handsets, encoders, Access controller) via USB, Bluetooth, NFC to receive and transmit data from/to software.

This ability of the electronic keys to communicate with the software allows the system administrator to ad-hoc remotely provide authorization to electronic keys to open selected electronic locks enabling therefore key users to access cargo containers only after authorization and for a specific time period.

The system administrator has always an audit trail of which key opened which lock and when.

Smart Key Cabinet

Online DMU

NFC/Bluetooth

Ethernet

Ethernet

Internet

USB

NFC/Bluetooth

NFC/Bluetooth