Electronic Door Lock

Overview

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Product Overview

NTT Semi-Trailer Electronic Door Lock

New Transport Technology introduces SmartLock PRO, an innovative solution tailored for cargo carriers involved in transporting high-value goods that require strict adherence to TAPA cargo protection standards. This cutting-edge product is specifically designed to meet the unique demands of safeguarding critical cargo during transportation.

The **SmartLock PRO** DSM v2.0 door lock is a versatile solution suitable for all types of trailers. This stainless steel lock can be conveniently controlled remotely through a telemetry system or a variable code keypad. It is securely mounted on the door of the semi-trailer, with unlocking and door opening data seamlessly transmitted to the office through a transport control system installed at the front of the semi-trailer. The electronic control module of the lock promptly sends notifications to designated individuals in the event of any unauthorized opening. Rest assured, this electronic lock fully complies with the TAPA Cargo Protection Regulation and meets the requirements set by insurance companies. Developed and manufactured by the skilled engineers at NTT, the **SmartLock PRO** offers exceptional reliability and can be customized to cater to the specific needs of different carriers.

Furthermore, you have the option to enhance your security measures by acquiring the **SmartLock PRO S** electronic door lock, complete with an additional safety package comprising alarms and various sensors. This comprehensive solution offers enhanced protection for your valuable cargo, ensuring peace of mind and security in transit.

Key Features

Remote Lock Control

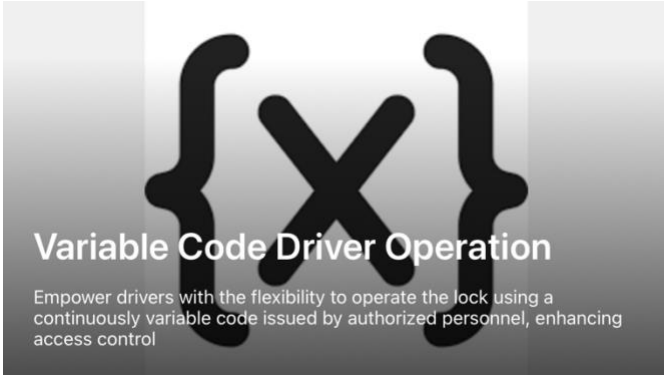
Achieve seamless management by remotely controlling the lock, ensuring operational convenience while maintaining security

Scheduled Driver Access

Facilitate streamlined operations by transferring lock control to drivers during predetermined times or within specific areas, enhancing workflow management.

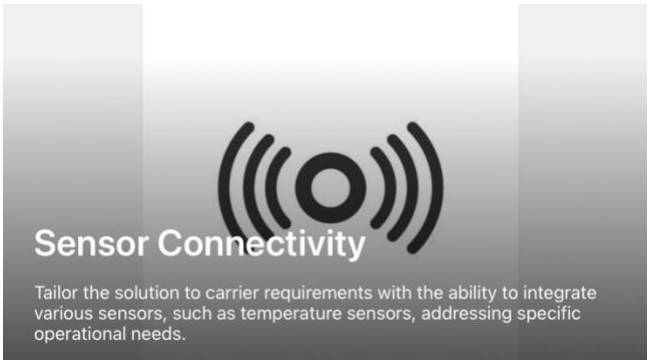
Geozone-Specific Unlocking

Ensure precise security measures with the capability to unlock the lock solely within designated geozones, optimizing location-specific control.



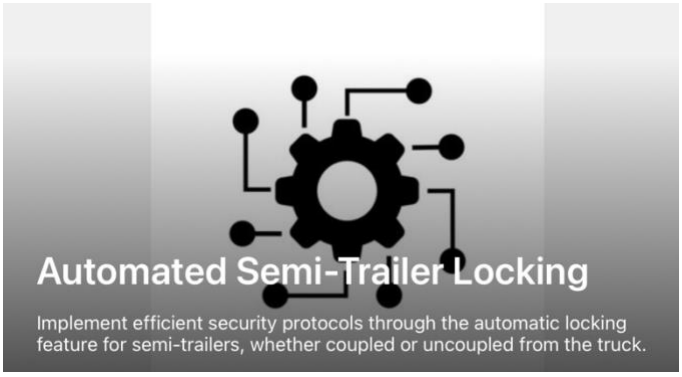
Variable Code Driver Operation

Empower drivers with the flexibility to operate the lock using a continuously variable code issued by authorized personnel, enhancing access control



Sensor Connectivity

Tailor the solution to carrier requirements with the ability to integrate various sensors, such as temperature sensors, addressing specific operational needs.



Automated Semi-Trailer Locking

Implement efficient security protocols through the automatic locking feature for semi-trailers, whether coupled or uncoupled from the truck.

Telemetry System Integration

Ensure a seamless fit within existing infrastructure by effortlessly integrating with diverse telemetry systems, promoting operational cohesion.

Secure Mode Activation

Enhance security levels through the automatic activation of a secure mode upon lock engagement, seamlessly deactivating upon remote unlocking.

Tested in Real Life

The SmartLock PRO electronic door lock for truck semi-trailers has undergone extensive and rigorous testing in real-world scenarios, enduring the most challenging conditions over an extended period. These tests involved installing the locks on semi-trailers traveling through scorching regions in Africa, enduring the harshest conditions in Scandinavia, operating in perpetually rainy areas of Europe, and enduring frequent icing in Scandinavian countries. These realistic tests have provided invaluable insights for enhancing the construction of the locks, ensuring transport companies can rely on exceptionally reliable performance from the equipment.

TAPA TSR Certification

The NTT Semi-trailer electronic door lock is designed to meet the rigorous standards necessary for a TAPA TSR certification. With a rising prevalence of cargo theft and the loss of high-value and pharmaceutical goods, transportation regulations have become more stringent. Obtaining a TAPA certification demonstrates that your supply chain adheres to proper security protocols, ensuring the protection and safety of your valuable goods throughout the transportation process.

Electric Door Lock Specification

Parameter	***Value***
Mechanical	
Material	stainless steel AISI304
Material thickness	body 3mm, hinge 15mm
Type of finishing	laser welding
Mounting material	6xISO8677,2xISO7045 screws, 6xISO7093 washers, 8xISO10511 fixation washers
Lock status sensor* open / closed	Reed switch (NO)
Lock integrity sensor* (Loop sensor)	loop (NC)
Working temperature	-40-+80C^{o}
Operating Humidity	IP65
Mounting options	housing screw fixing, hinge welding
Time to Open/Close, avg	3 sec
Dimensions, LxWxH	225x210x55mm
Weight	11 kg
Ingress Protection Rating	IPW66
Actuator (bolt) motion length, max	30-50mm (can be reduced during calibration)
Electrical	
Supply voltage range	10-16V
Overvoltage protection	yes, electronical, self-restoring
Overvoltage protection, max hold	70V

Supply current, active	< 2A
Supply current, ready	< 15mA
Supply current, sleep	< 5mA
Overcurrent protection	yes, electronical and fuse
Ingress Protection Rating	IP69
Digital Inputs	2
Digital Inputs, levels	Ulow<2V Uhigh>3V
Actuator control	with position and current monitoring
Interface with keyboard	serial
External Emergency supply connection	yes, from keypad side
Communication	
RS232	optional
CAN	optional
Bluetooth	optional
RS485	yes
Encryption	yes
Indication	
LED indictor	yes
Buzzer: for key press confirmation, Alarm	yes
Operational conditions	
Operating humidity	5-95%
Operating temperature	-40 °C to +85 °C

The Main Parts of the Electronic Door Lock

1) Door Lock with Locking Loop

2) Left Door Locking Plate made of 10mm steel

3) Right Door Locking Plate made of 10mm steel

4) Fasteners

5) Control Panel of the Lock

6) Actuator

Door Lock with Locking Loop

Description: The door lock consists of a robust and durable body made from stainless steel AISI304, to withstand tampering, cutting, and harsh environmental conditions. It has a compact and ergonomic design that allows for easy installation and operation

Purpose: It is designed to ensure reliable and safe fixation of doors, ensuring their reliable closing and preventing unauthorized access to the cargo space of semi-trailers.

Mounting materials: Stainless steel fasteners are included

Advantages: Stainless steel resistant to mechanical damage, protects structures from rust throughout its service life. The quality of lock does not depend on weather conditions.

2) Left Door Locking Plate made of 10mm steel

Description: Affixed to the left door through utilization of the pre-existing mounting points designated for the door opening handle, thereby obviating the need for any supplementary perforations

Purpose: Enhance security measures for the left door to prevent unauthorized access

Mounting materials: Stainless steel fasteners are included

Advantages: The lock plate, constructed from robust 12mm steel, offers exceptional durability and resilience, ensuring a formidable deterrent against unauthorized access. Its substantial thickness contributes to enhanced structural integrity, effectively fortifying security measures for sustained protection

Possibility to install a 5 mm thick stainless steel left door locking plate (different plate sizes are available upon request)

Left Door Locking Plate (installed)

Left Door Locking Plate made of 10mm steel (K-4652)

Left Door Locking Plate made of 5mm stainless steel B5

Left Door Locking Plate made of 5mm stainless steel B6

3) Right Door Locking Plate made of 10mm steel

Description: Mounted onto the right door by utilizing the pre-existing mounting points allocated for the door opening handle, eliminating the necessity of drilling any additional holes in the door

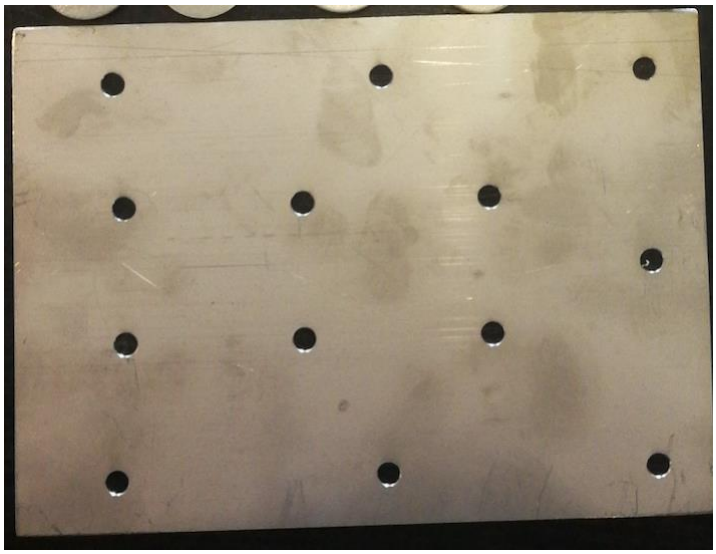
Purpose: Enhance the structural integrity of the locking plate on the left door

Mounting materials: Stainless steel fasteners are included

Advantages: Crafted from robust 12mm steel, boasts heightened resilience, ensuring formidable resistance against tampering and unauthorized access. Its steel composition not only guarantees durability but also offers superior corrosion resistance, providing an extended service life

Possibility of installing a 5 mm thick stainless steel right door locking plate (different plate sizes are available upon request)

Right Door Locking Plat (installed)



Right Door Locking Plate made of 10mm steel (K-4653; left)

Right Door Locking Plate made of 5mm stainless steel (right)

4) Fasteners

Description: Fasteners for a mechanical door lock are designed specifically for use in semi-trailers. Manufactured from high quality stainless steel for reliability, durability and corrosion resistance.

Purpose: The purpose of these fasteners is to securely and securely fix the mechanical door lock to semi-trailers. The use of stainless steel as a material makes it possible to guarantee resistance to moisture, aggressive environments and variable weather conditions, which ensures a long service life and reliable operation of important semi-trailer components.

Fasteners

5) Control Panel of the Lock (MAIN)

Description: The keyboard integrated into the Electronical Door Locking System offers an intuitive user interface with LED indicators for clear visual status updates. Complemented by a responsive buzzer, it ensures both visual and auditory feedback for seamless interaction. Its ergonomic layout and remote management capabilities enhance user convenience and security.

Purpose: By adhering to TAPA standards, the keyboard enhances security protocols. It ensures that only authorized individuals, such as the driver, can unlock the door by inputting the PIN, thus fortifying the overall security of the system.

Control Panel of the Lock

6) Actuator

Description: The actuator, a core component of the electronic door lock, serves as the mechanical powerhouse responsible for translating electronic commands into physical motion. Engineered with precision, it engages the lock's mechanism to facilitate secure door locking and unlocking actions.

Purpose: The actuator's primary purpose is to provide a reliable and controlled means of transitioning between locked and unlocked states within the electronic door lock system. By seamlessly responding to electronic inputs, such as PIN verifications, it ensures authorized access while upholding the system's security protocols, thus safeguarding the contents of trailers and enhancing overall operational efficiency.

Actuator

Additionally:

- Possibility to install a lock position sensor
- Possibility to install a lock damage sensor
- Possibility to install Right and Left Door Locking Plate made of 5mm stainless steel
- Possibility to install Right and Left Door Locking Plate made of 10mm steel
- Possibility to install only Left Door Locking Plate made of 5mm stainless steel
- Tailored product customization is accessible for utilization in a variety of trailer types including REEFER, BOX, and CURTAINSIDER configurations. Furthermore, we are prepared to accommodate additional customizations as per the specific requirements and preferences of our esteemed customers.

Upon customer request, we adeptly design and expeditiously implement changes to meet their specific needs

The operation of the electronic lock can be broken down into the following steps:

1.When a driver takes possession of or transfers a trailer, they initiate the process by pressing the asterisk (*) key on the lock's keypad.

2. Upon pressing the asterisk key, the keypad displays a 4-digit code. This code is unique to the current session.

3. The driver contacts the responsible personnel in the office and communicates the 4-digit code displayed on the keypad.

4. The office personnel, upon receiving the code from the driver, generate and provide the corresponding PIN code for unlocking and locking the electronic lock.

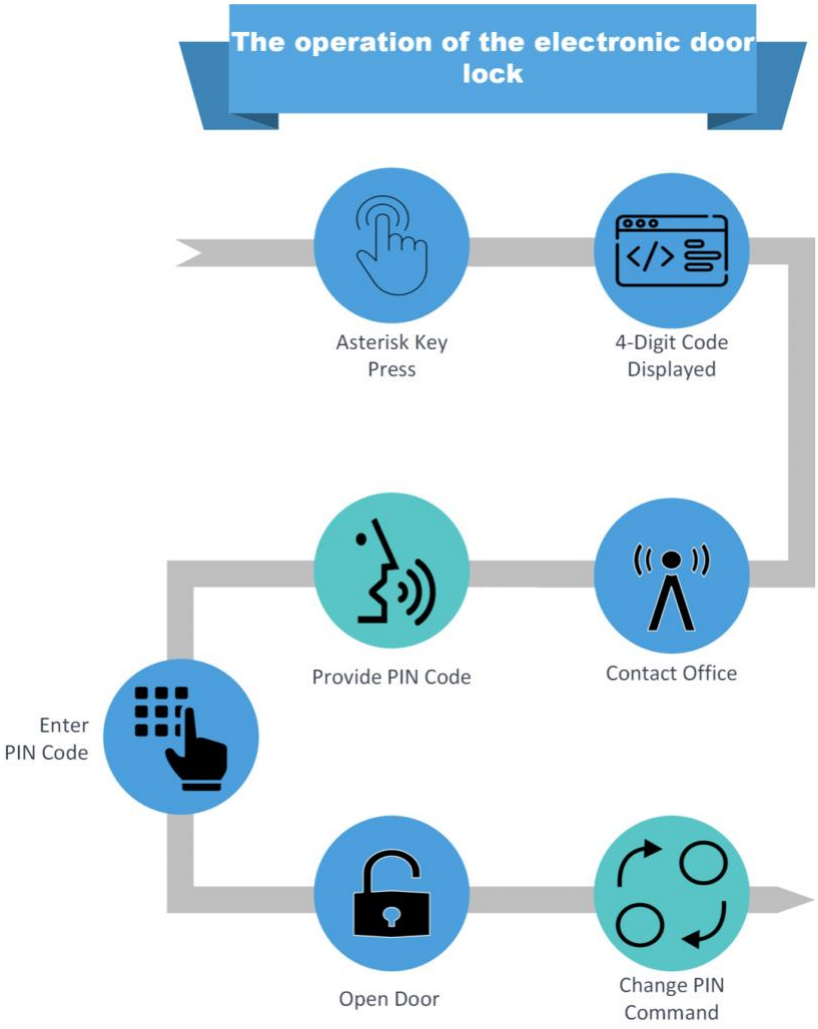
5. The assigned PIN code remains unchanged until the responsible personnel in the office send a "Change PIN" command to the lock.

6. If necessary, the responsible personnel can remotely send a "Change PIN" command to the lock from the office.

7. Upon receiving the "Change PIN" command, the driver, particularly a new driver, must contact the office again to obtain the new PIN code, which is displayed on the keypad screen.

If the driver enters an incorrect PIN code, the keypad will display an "Err4" error message, indicating that the input was incorrect.

The responsible personnel have a PIN code generator, which generates PIN codes for unlocking based on driver requests and specific protocols. This generator ensures secure access control and authentication for the lock.



There are three ways to change the electronic lock password:

1) **Constant Password:** In this method, the password remains constant forever and never changes.

2) **Password Change by Responsible Personnel:** The password changes when a responsible person in the office decides to change it. This typically occurs when a new driver takes charge of the semi-trailer, for example.

3) **Dynamic Password Changing:** In this approach, the password constantly changes after each instance of opening and closing the lock. Therefore, every time the semi-trailer is accessed, a new password is required, and the driver must contact the office to obtain the updated password. This ensures that the password is always unique for each access event and necessitates communication with the office for security reasons.

Foundational Operational Principles

The smart lock system operates on a set of three distinct user classifications, each assigned specific permissions: Driver, Installer, and Master (the most advanced role).

Driver: This role entails the right to perform actions such as opening-closing, emergency opening-closing, enabling and disabling automatic closing.
Installer: Users designated as installers have the ability to manage device parameter configuration, calibration, block binding, reset driver password, and change configuration password.
Master: The “Master” designation provides access to open-close functions, block linking, the ability to change the installer password, and the ability to change the master password.

The design philosophy revolves around hierarchical control, where users at higher levels possess authority over functions available to lower-tier users

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Fell free to reach out to us with any problems or challenges you may have, and we will gladly work towards finding effective solutions to address them