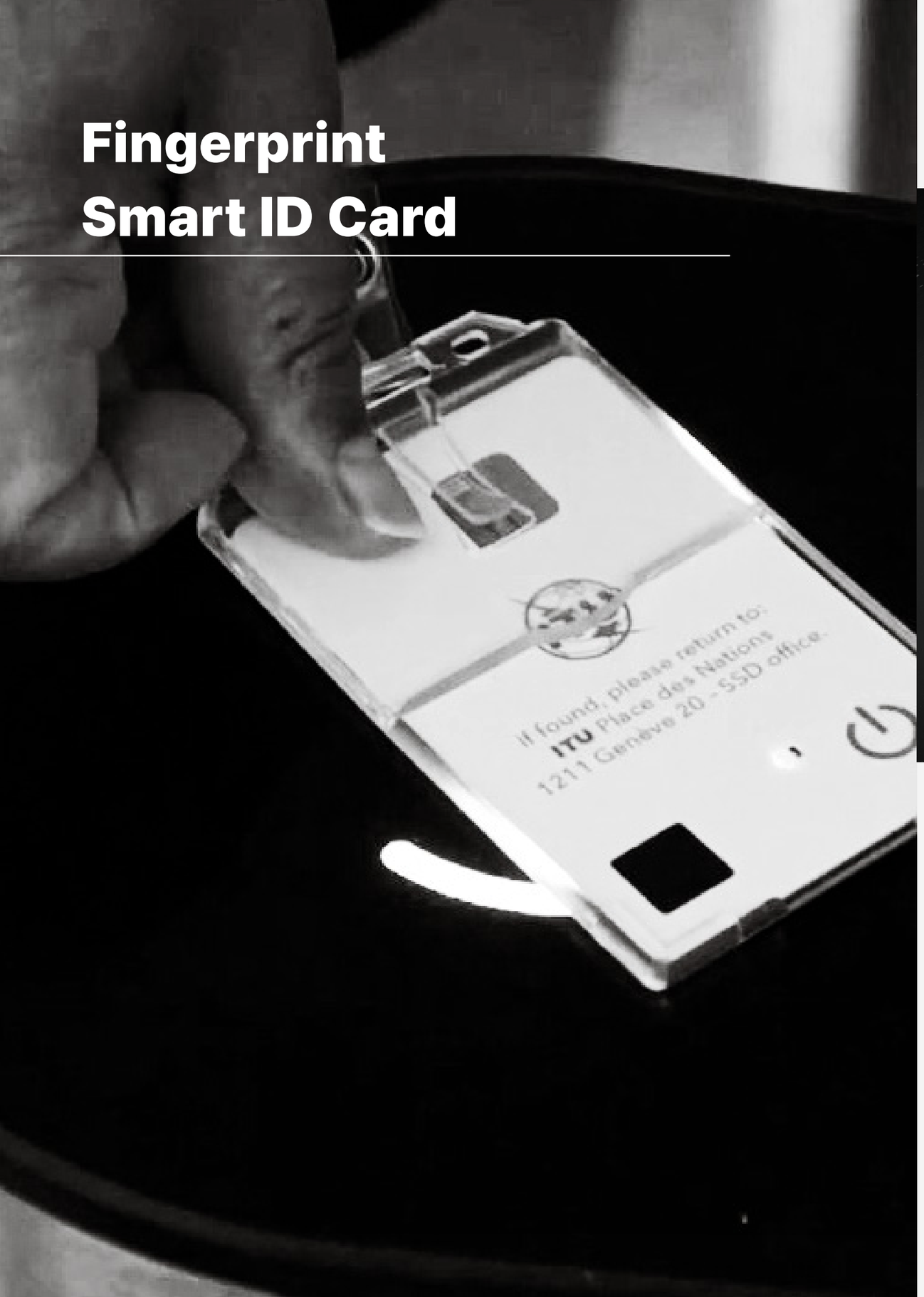

TUNNEL
Tunnel of Biometric
Security Technology



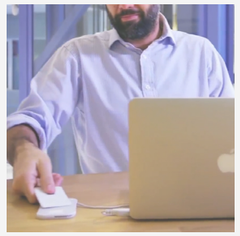
Fingerprint Biometric Technology Integrated with a Smart Card

· Stores the cardholder's fingerprint information directly on the card for authentication.
It is applicable to various fields, including access security, PC logon, and identification

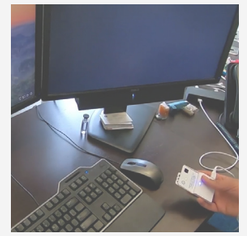
Application Fields

· Access Control

· PC Logon



· Web & S/W Programs



· Office Equipment

· Mobile Devices

· Payment

Existing RF Card Access System Problems

Card Cloning Possibility

· RFID card data is easy to clone or copy.
· Low-cost systems lack encryption and are vulnerable to data sniffing or reader attacks.

Signal Interception

· Wireless data transmission allows for signal interception and theft.

Lost Card

· If the card is lost or stolen, it can be misused for unauthorized access.

Fingerprint Recognition Access System Issues

Security Vulnerabilities

· Fake Fingerprint Issues, Data Leaks, Server Hacking
  - Advanced technologies pose a risk of bypassing the system by duplicating or counterfeiting fingerprints.
  - Fingerprint data is sensitive information that cannot be changed, and its leakage could result in a significant security incident.
  - If fingerprint data stored on a central server is hacked, it may lead to data breaches and service disruptions.

User Inconvenience

· Hygiene Issues
  - Using the same fingerprint recognition sensor for multiple users can raise hygiene concerns and cause discomfort, especially in cleanliness-sensitive environments (e.g., hospitals, food manufacturing companies).

Technical Limitations

· Recognition Speed Issues, Compatibility Issues
  - If multiple users access the system simultaneously, the fingerprint recognition speed may decrease, resulting in longer wait times for access.
  - The presence of various fingerprint recognition technologies (e.g., capacitive, optical, etc.) can create integration challenges due to incompatibility between different systems.

Expected Benefits of Fingerprint Recognition Smart ID

Instead of using a fixed fingerprint access terminal that is touched by an unspecified number of people, this system provides a non-contact access security solution suitable for the post-Corona era.
It authenticates the user's fingerprint through their own smart ID card before granting access

Convenience

- Can be used in the same way as an RFID card.
- Does not require a built-in battery, eliminating the inconvenience of charging or discharging.
- Supports NFC amplified recognition through a dedicated folder for cards with a built-in battery.

Security

- Fingerprints can be registered on the fingerprint ID card and used exclusively by the registered individual.
- Prevents unauthorized use by others in case of card loss.
- Provides biometric security at the same level as fingerprint access systems.
- Fingerprint information is securely stored within the card, reducing the risk of hacking.

Safety

- Unlike traditional fingerprint access systems, physical contact with public terminals for authentication is not required.
- Supports non-contact biometric authentication, aligning with post-Corona era trends.
- Reduces secondary risks, such as infections, through non-contact methods.

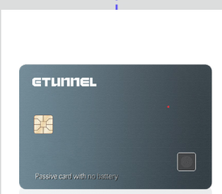
Scalability

- In addition to access security, it can be integrated with card readers to apply security features such as PC (Windows) logon.
- Supports various security and authentication methods, including mobile office access authentication via NFC.

RFID Access Control Process

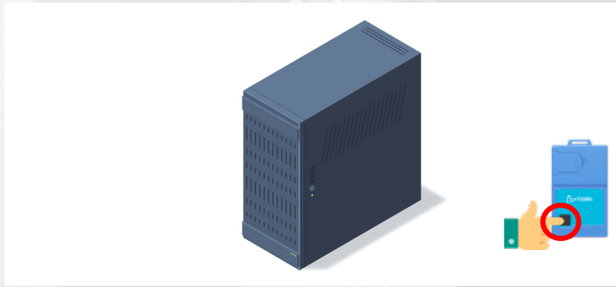
RFID Card

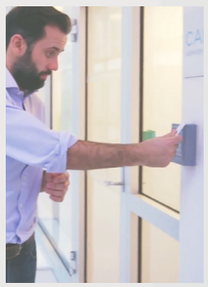
Issuance of Fingerprint Smart ID Card Replacement

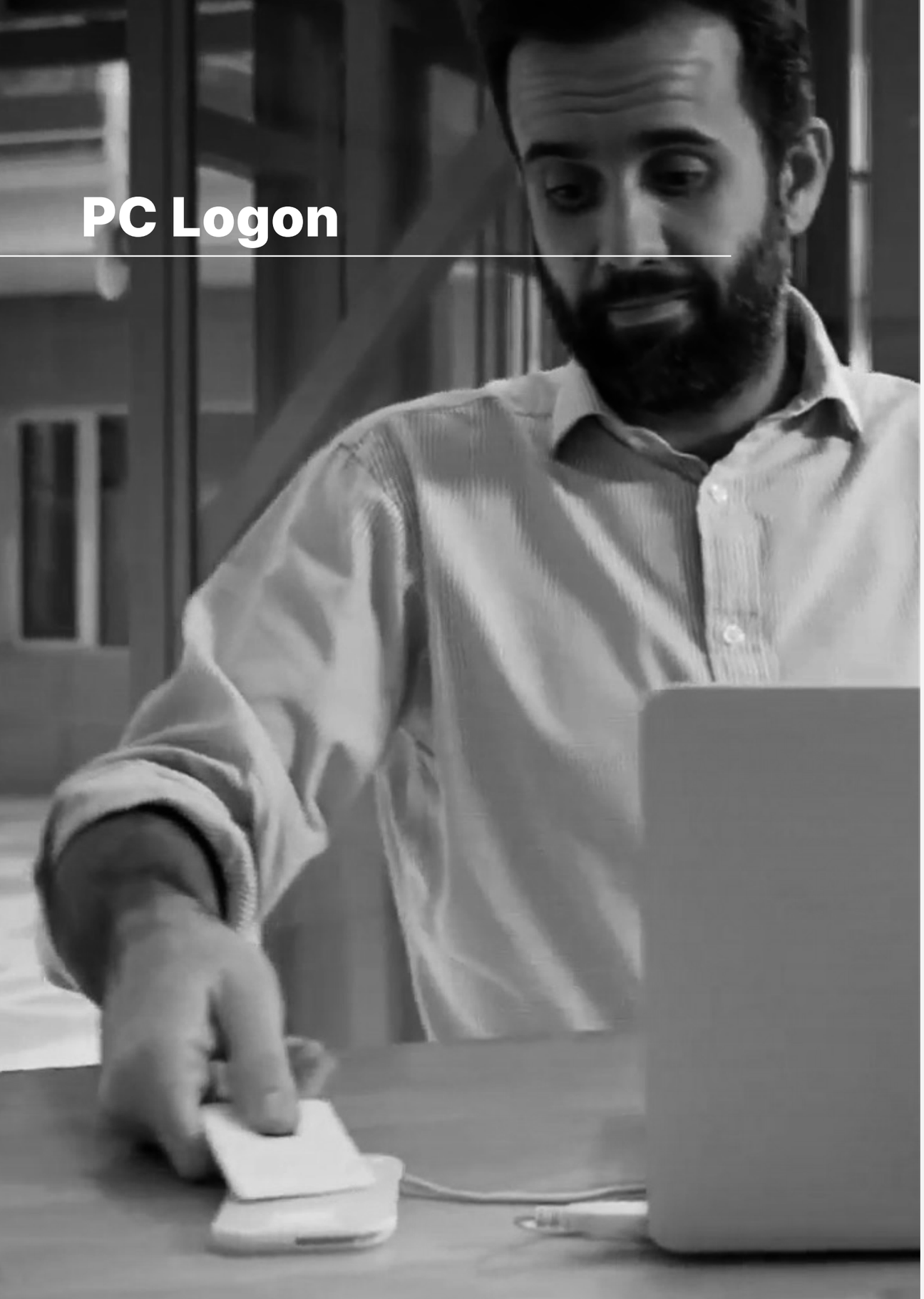


Registering the individual's own fingerprint on their Fingerprint Smart ID card

Current Access Control System







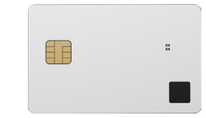
PC Logon

PC Logon Process

Password

PC Logon

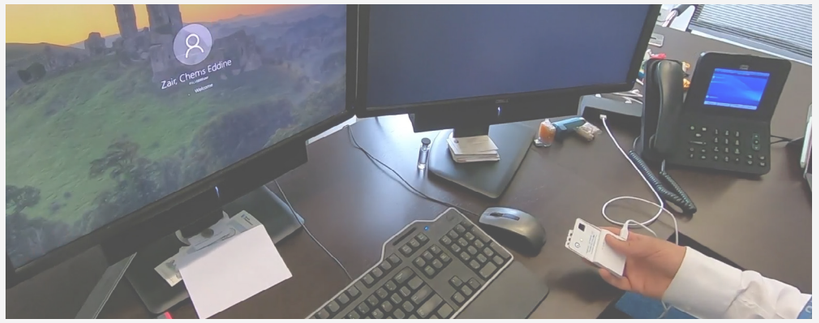
Fingerprint Smart ID Card



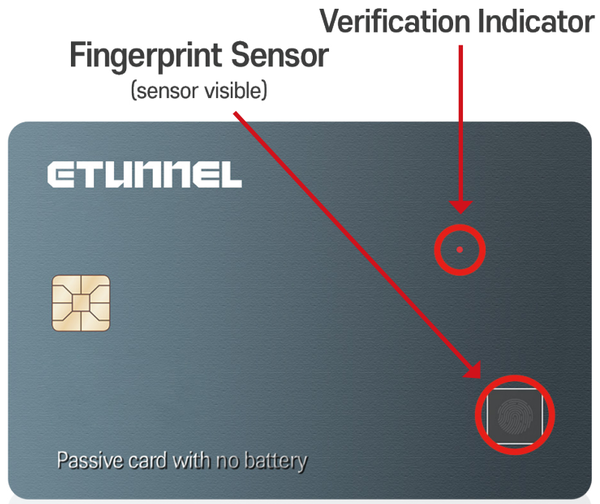
Register Fingerprint Smart ID Card on PC

Installation of Fingerprint Smart ID Card Reader

PC Logon



ETUNNEL-SC-100P (Fingerprint Smart ID Card)



» **When the registered fingerprint matches,** the green LED lights up, and access is granted.

» **When it does not match,** the red LED lights up, and access is denied.

Product Specifications and Key Features			
Power Source	· Energy Harvesting from RFID Field	Cycle Life	· RF IC Read/Write 100,000 times
Dimensions	· IS07816-1, type ID-1, 85.6(W)*54(H)*0.74-0.84(D)mm	Sensing Area	· 4*4mm : 56*56 pixel
Sensor Pixel Size	· 70*70um	Special Resolution	· 363 DPI
ADC Pixel Resolution	· 14 Bits Gray Sacle	FRR/FAR	· 2% / 0.01%
ESD	· +/- 8KV (Contact mode)	Operating Temperature	· 0°C~45°C
Extended Humidity	· 65 ~ 90% RH	Contactless RFID chips	· HID iClass, I code sli, Tag it, Mifare Classic, 4k, 8k, DesFire EV1, FeliCa

ETUNNEL-CC-100 (Fingerprint Smart ID Card Holder)

Designed to be compatible with existing smart card readers, reducing additional infrastructure costs

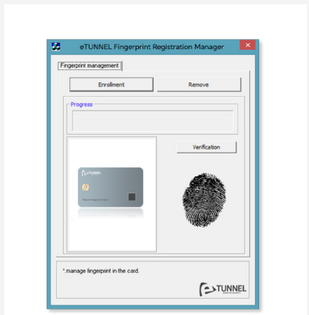
Material

· Polycarbonate(PC) + Acrylonitrile Butadiene Styrene(ABS)

Composition

· 105(W)*63(H)*10(T)mm
· Battery: CR2016
· Color: Customize

ETUNNEL-CR-100 (Fingerprint Registration & Software (SW))



Fingerprint Registration Management Software (SW)

- Description
  Software designed to register the user's fingerprint.
- Platform
  Windows-only application.

Fingerprint Registration Terminal

- Description
  A dedicated terminal where users insert the fingerprint ID card and register their fingerprint using a contact-based method.

Fingerprint Smart ID Implementation Process

01 Check Access Terminal Protocol (NXP Communication Mifare Series)

02 Integration of Access Control System with IC Chip by Supplier

03 Fingerprint Enrollment System Implementation

04 POC Test

05 Place Order after Final Design Confirmation

When Using an RF-Based Access Control System

• If Using an NFC Card with the Mifare (NXP Access Protocol Method)

A. Replacing RFID Cards with Fingerprint Smart ID Cards

a. Mifare RF Card Users

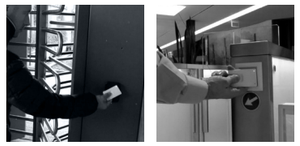
a. No need to develop a new communication protocol
b. No changes to the terminal firmware
c. Only the UID of the new fingerprint Smart ID needs to be registered
d. Smart ID card holder is required.

B. Application Process

» Registering Fingerprint ID Cards Through the Existing RFID Card Registration System

a. Delete the UID of the existing user in the access control management program
b. Register the user's fingerprint
c. Register the UID of the new Smart ID
d. No changes to the access control terminal firmware

Existing Access Control System



Access with Fingerprint Smart ID Card

» Using Fingerprint Smart ID Without Firmware Changes to the Access Control Terminal

• If using a CPU-embedded SE (Secure Elements) IC CHIP card

A. Replacing RFID Cards with Fingerprint Smart ID Cards

a. SE IC CHIP card Users
b. Applying the client's protocol

a. Apply the fingerprint API to the client's protocol (Requires cooperation with the protocol development company)
b. Upload the fingerprint API-applied protocol to the **fingerprint Smart ID**
c. Update the firmware of the terminal with the fingerprint API-applied protocol
d. **A fingerprint Smart ID holder is not required**

B. Application Process

» Registering Fingerprint ID Cards Through the Existing RFID Card Registration System

a. Delete the UID of the existing user in the access control management program
b. Register the user's fingerprint
c. Register the UID of the new Smart ID

Existing Access Control System

Access with Fingerprint Smart ID Card

» Access control is granted using the protocol with the fingerprint API applied inside the access control terminal.

Fingerprint Smart ID Card Standard Price Table

Item	Product Name	200EA or below	1k or below	5K or below	Above 10k
	Fingerprint Smart ID card	$50	$40	$35	$25
	Smart ID card Holder	$10	$9.5	$9	$8
	Registration Device	$25	Fingerprint registration devices are required only for administrators, so a large quantity is not needed.		
Remarks	• **Period of supply :** Depends on quantity **(For example, for an order of 1,000 units, the estimated lead time is about 2 months.)** • **Shipping terms :** FOB • **Payment terms** : T/T **Advance** • **MOQ** : 1K • **For orders above 10K, the supply schedule needs to be discussed separately.**				

Quotation (Special Offer)

Product	Description	Qyt(EA)	Unit Price	Special offer	Amount
1. Fingerprint smart card	• IC CHIP _MF1S50 NXP Mifare classic EV1 ISO 14443 TYPE A 13.56 Frequency / 7Bite UID • Finger Print Sensor Pixel Size 56*56 DPI 363	100EA	$50.00	$40.00	$4,000.00
2. Card Holder	• Smart ID Card Holder	100EA	$10	$8.00	$800.00
3. Registration Device	• Fingerprint registration device	1EA	$25		

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