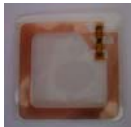


Physical Tagging with Fingerprint RFID tags – Weapon/Rifle tagging By Kwek Chang of Hense Technology Pte Ltd

With the increasing need for better security especially in the area of weapon tracking and storage, new security features such as physical tracking and weapon owner identification can now be added in the weapon management system. These new features can be accomplished by using biometric technology such as fingerprint matching. With the advancement of the secure RFID and the fingerprint technology including the algorithm and accuracy, it is now possible to embed fingerprint templates in RFIDs such as Mifare by Philips which is widely being used commercially today.

The FS25 from Hense Technology incorporates a fingerprint scanner with a Mifare reader and writer into a single compact device, enabling the unique combination of fingerprint and RFID technologies for applications such as physical tagging, physical identification and physical verification. With the FS25 USB-based fingerprint scanner, a cost effective “Match on Device” can be implemented instead of expensive contact cards using large memory chip and a silicon fingerprint scanner. The FS25 is one of the smallest optical fingerprint scanners available that meets the requirements for most security standards for fingerprint quality.

With the availability of the FS25 RFID and fingerprint scanner, a cost effective Physical Tagging system for weapons or rifles can be easily implemented. The key components are Mifare tags in PET form which is very light and water/oil proof, the FS25 fingerprint scanner and the application software to track the transactions.



Mifare – PET Tags

FS25 USB Fingerprint scanner with Mifare reader/writer

The rifle is first tagged with the Mifare tags as below:



Following is the general process flow for the Physical Tagging system for the Rifle:

1. First, all the rifles in the armoury are individually tag with the PET tags using e.g. super epoxy glue.
2. Once the rifle is assigned to a soldier, the fingerprint image is taken and a fingerprint template is created.
3. The soldier's information such ID, Name, Dept and rifle number together with his fingerprint template is programmed into the rifle's PET Tags using the FS25.
4. When a soldier needs to draw out the rifle from the armoury, he will go to the armoury staff and tell him the rifle number. Staff takes the rifle and before giving the rifle to the soldier, he will scan the PET tag on the rifle so as to download the fingerprint template on to the FS25.
5. Next, the staff will ask for the live finger of the soldier to be presented on the FS25 scanner.
6. Once the live finger matches the fingerprint template in the rifle tag thereby confirming the owner of the weapon.
7. The system tracks the entry and record down the information, such as rifle ID, soldier name and time the weapon is drawn-out. Also the system will be able to show INSTANTLY how many weapons are in the armoury and how many rifles have been taken out.



8. When the rifle is returned, the soldier must place his fingerprint to be authenticated to confirm his identity.
9. Only when the system positively identify the person, the armoury staff will take back rifle. If another person is returning the rifle, the finger presented will not match and the armoury staff is alerted and immediate actions can be taken.
10. The system will now record the time the rifle has been returned and also update the total number of rifles in the armoury immediately.

Rifle Number	Soldier ID	Soldier Name	Date/Time OUT	Time IN
1012345	5666	Cpl Lim Teck Ann	8 July 08 12:30pm	9 July 08 7:30am
1012444	5668	Sgt Mohd bin Ali	8 July 08 4:00pm	8 July 08 9:32pm
1000338	66789	Cpt Tan KS	10July 08 8:05am	
1013443	5475	Pte Kang SS	10July 08 9:12am	
Total Rifle IN	234			
Total Rifle Out	18			

The information details for this weapon physical tagging system can be customised according to the requirements of the organizations so as it can provide the necessary information and trigger actions to suit the different requirements. The key advantage is that this system can provide REALTIME information that is up-to-date by the seconds and this information can be accessed online anytime, and anywhere.

Advantages of this Physical Tagging Weapon/Rifle System:

1. Provide **two form-factor** authentications which are ID and biometric technology using fingerprint.
2. **Increase the security level** of the weapon control system by providing immediate alert and prevent any withdrawal should an unauthorised person attempt to draw out the weapon.
3. **Convenient and efficient** as it is a wireless technology using secure RFID tag that are light weight that do not alter the weight distribution of the weapon. Tags are water and oil proof.
4. **Cost effective and simple implementation** since the RFID tags on the rifle are reprogrammable thus when the rifle is reassigned to another soldier, it will be reprogrammed with the new fingerprint template and information.
5. **Maintenance-free system** with an advance optical technology used in the fingerprint scanner that allows the scanner to work with all types of fingers, wet, dry and oily and also in all conditions such as dusty, bright sunlight and total darkness. The **optical scanner module has been certified by US Government FBI to meet their PIV specifications** which are used for the e-Passport and ID verification.
6. **Real-time information** available immediately as compared to current system where the soldier will write the information with date and time on a log book for the rifle withdrawal and return. With this system, no more manual writing of information is required, simply scan and verify the finger and system will capture the time and also provides other information such as total number of rifles taken out, how many taken out today by the hour etc.
7. **Easy and Remote access to the Weapon System** information by providing remote logon to the database so as any authorised user can view the information on the weapon system detail. Example, a commander in the camp with a click of a button can get the number of rifles drawn out that morning and how many are still in the armoury.
8. **Portable and Mobile design.** As the FS25 is a USB based scanner with the size of a mouse, the reader terminal can be easily setup in the field using a Notebook PC with the database download. This will provide efficient and effective means to track weapons in the field and identify the weapon to the correct soldier especially if the weapon has been tuned to his requirements.

In summary, this Weapon tagging system using Fingerprint template RFIDs(Mifare) will provide an added security dimension to the current weapon system that physically identify and track the weapon and authorised owner at the point of withdrawal and return at the armoury. This will ensure the right person get the right weapon in fast and effective way removing the need of the armoury staff to check IDs and do manual documentation. By using limited hardware (just the FS25 scanner) and reprogramming RFID tags, this system can be easily and cost-effective implemented. So, start tagging the rifles and weapons with the assigned soldiers fingerprint to ensure a secure control of the weapon in any organization.

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