

Brief background

Smart Identity Card

Since mid 2003, Hong Kong residents have been issued with a smart identity card that contains a chip. Stored inside the chip are the key personal data of the cardholder, facial image and a pair of fingerprint templates. The smart identity card is a polycarbonate card of standard credit card size. The production and processing of this smart identity card is supported by the Smart Identity Card System (SMARTICS).

The e-Channel

The introduction of the smart identity card provides a solid foundation for the implementation of the Automated Passenger Clearance (APC) and the Automated Vehicle Clearance (AVC) Systems (also known as e-Channel) which are self-service passenger/driver immigration clearance facilities installed at immigration control points in order to meet the business challenge, especially the ever increasing cross-boundary traffic. The self-service facilities are equipped with smart card readers and fingerprint scanners that are housed in the APC channels situated in immigration halls and the AVC kiosks so as to dispense with visual inspection by immigration control officers.

For the AVC e-Channel, in addition to fingerprint verification technology, they are also equipped with face recognition system. To use the e-channel is simple. The drivers stop their vehicles before the white line of the channel. When the green traffic light of the e-channel turns on, they can drive their vehicles into the channel. At the same time, the sensors at its two sides will control the checking station to move to the suitable height, enabling drivers to place the thumbs flat on the scanner and simultaneously look at the camera on the checking station. Both fingerprint verification and face recognition will be in progress at the same time for speeding up the clearance process. Upon completion of the clearance, they can drive their vehicles away. If the drivers encounter any problem, they can use the intercom of the checking station to contact the immigration staff.

The e-Channels have begun operation by phases since December 2004 for the APC and April 2005 for the AVC at various immigration control points. So far, 243 APC e-Channels and 40 AVC e-Channels have been installed. For easy reference, you may access the information on the e-Channel in our Website by the following paths and

some photos are also enclosed.

<http://www.immd.gov.hk/ehhtml/20041216.htm#apc> - APC e-Channel Website (this webpage has a link with a live video showing how the e-channel works at immigration control points)

<http://www.immd.gov.hk/ehhtml/20041216.htm#avc> - AVC e-Channel Website

Deployment of these technologies at Immigration Control Points

Location of control points

Passengers who travel to Hong Kong by air, land or sea may choose any one of the following 9 immigration control points for entry and exit.

- By air - Hong Kong International Airport
- By Sea - China Ferry Terminal, Macau Ferry Terminal, Tuen Mun Ferry Terminal
- By land – Lo Wu, Lok Ma Chau, Man Kam To, Sha Tau Kok, Hung Hom

For more information, you may access our Website by the following path.

<http://www.immd.gov.hk/ehhtml/immdctlpts.htm>

Benefits to users

Resident

With the APC e-Channel, Hong Kong residents can now use their Hong Kong Smart Identity card to conduct self-service immigration clearance when travelling in and out of Hong Kong. But, they can also use their Hong Kong Smart Identity Card to present for immigration clearance at the traditional immigration counters.

Driver

Cross-boundary drivers can now enjoy more speedy self-service immigration clearance with their Hong Kong Smart Identity Card by using the AVC e-Channel. They can even conduct fingerprint verification and face recognition to verify their identity without using their smart identity cards during the self-service immigration clearance.

Visitor

For visitors, they can use our traditional immigration counters which are also employed with document reader and facial recognition technologies for immigration clearance. The whole bio-data page of the page of the passengers' travel document i.e. photo and personal data will be captured for checking over the counter.

Replies to questions

1. Do you use automated reader devices at the border crossing points to verify the identity of people crossing the border?

At our control points, fingerprint scanners and facial recognition equipment are used for identity verification.

2. Do these readers read data from a card that is carried by the person crossing the border?

Data are read from the chip of the Hong Kong Smart Identity Card by the smart card reader when using the APC e-Channel services.

3. What type of card technology is used? Smart chip, bar code, optical memory, magnetic strip, or other?

An Infineon smartcard chip with MULTOS operating system is used.

4. If a smart chip is used, does the chip have to be inserted into the reader opening or is data transferred from the card to the reader over a radio frequency interface (contactless)?

The Hong Kong Smart Identity Card needs to be inserted into a smart card reader for data retrieval.

5. Is the data transfer encrypted?

Data transfer is encrypted.

6. Is the person crossing the border required to present their fingerprint in addition to presenting the card?

Persons using e-Channel services need to present their fingerprint in addition to presenting the Hong Kong Smart Identity Card. Cross-boundary drivers can conduct fingerprint verification and face recognition to verify their identity without using their Hong Kong Smart Identity Card during the self-service

immigration clearance.

7. If so, the presented fingerprint matched with the enrolled finger data stored in/on the card or with the fingerprint data stored in a data base?

For the APC e-Channel, the live captured fingerprint will be matched with the fingerprint template retrieved from the chip of the Hong Kong Smart Identity card. For the drivers who have already given consent to use their personal data kept in our database, when they use the AVC e-channel, their live captured fingerprint will be matched with that stored in the database, and in this way they do not need to use their smart identity cards.

8. How many fingerprint readers are used at the border crossing points in your system?

The APC e-Channel can be divided into two categories i.e. unidirectional and bidirectional. Each unidirectional APC e-Channel is housed with a fingerprint scanner. For the bidirectional APC e-Channel, it is housed with two fingerprint scanners. Currently, there are 15 bidirectional APC e-Channels and they are all installed at our Land Boundary control points. Therefore, a total of 298 fingerprint scanners are currently used.

9. Are the fingerprint readers used to confirm the identity of persons driving motor vehicles, persons on motorcycles or bicycles, pedestrians, or all of the above?

Currently, persons on motorcycles or bicycles cannot use the e-Channel services. The fingerprint verification and facial technologies are used to confirm the identity of persons using the e-Channel services.

10. How do you check the cards of multiple passengers in cars or buses? Are passengers required to disembark to present their cards?

Currently, the AVC e-Channels only cater for the cross-boundary drivers. Passengers in a vehicle are required to use either the traditional manual clearance or APC e-Channels in immigration halls for immigration clearance. In order to extend our e-Channel services to passengers in cars, enhancement work is being conducted.

11. If the fingerprint readers are permanently mounted at a gate or entry point, are they installed in a protected environment or they directly exposed to the weather?

The fingerprint scanners are installed inside the locked cabinet of the APC e-Channels in immigration clearance halls with air-conditioning. For the AVC e-Channels, they are housed into a checking station in an AVC kiosk that is sheltered by canopy.

12. What is the total daily average and total peak daily volume of fingerprint verifications at all border crossing points in your system?

The APC and AVC e-Channels of all our immigration control points handle an average of 300,000 and 26,000 passengers respectively in normal days. The daily record high of the APC and AVC e-Channels is about 370,000 and 28,000 respectively.

13. What is the typical daily average and peak daily volume of fingerprint verifications for a single reader?

The figures vary from different immigration control points. For our busiest Land Boundary control point i.e. Lo Wu in that 104 APC e-Channels are installed and is 17 hours operation, the typical daily average of fingerprint verifications for a single reader is about 1,700. The peak daily volume can reach about 3,800.

14. How long has the current technology been operational?

The Immigration Department of the Hong Kong Special Administrative Region Government rolled out the first APC e-Channel and the first AVC e-Channel in December 2004 and April 2005 respectively. The implementation of both APC and AVC e-Channels were completed in May 2006.

15. How many fingers enrolled?

The Department collects two fingerprints from each of the Hong Kong residents during enrolment.

16. Is there a quality check at the time of enrollment that would allow re-enrollment if it is determined that an enrolled fingerprint is not suitable for use in subsequent verification?

Upon the registration of a Hong Kong Smart Identity Card, our officer will take the fingerprint image of the registrant through the fingerprint scanner of the SMARTICS. The SMARTICS will conduct the automatic quality check of the fingerprint image. If the quality of the captured fingerprint image is not good enough, our officer will re-take the fingerprint image of the registrant. Despite that, passengers with blurred fingerprints may still encounter difficulty in fingerprint verification process.

17. At the time of enrollment, is there a “test verification” step to confirm that a good template was generated?

In addition to the automatic quality check of fingerprint image, a verification test will be conducted by another officer during the assessment interview with the registrant. In the interview, another fingerprint will be captured through another fingerprint scanner to compare the digital fingerprint collected earlier in order to ensure that a good template is generated.

18. What is the average elapsed time from presentation of card to completion of entry transaction (including any gate opening process)?

The whole self-service immigration clearance is about 10 seconds.

19. What is the average elapsed time for the fingerprint verification alone (e.g. from placement of finger to match decision)?

It is about 4 seconds.

20. What is the maximum sustained rate of entry that you have observed during an hour for pedestrians or those riding bicycles or motorcycles who are required to use fingerprints?

Currently, persons riding bicycles or motorcycles cannot use the e-Channel services. In hour of a normal day, we recorded about 13,000 passengers using the APC e-Channels at our busiest Land Boundary crossing point i.e. Lo Wu in that 104 APC e-Channels are installed and is 17 hours operation.

21. What is the maximum sustained rate of entry that you have observed during an hour for persons driving trucks or automobiles who are required to use fingerprints?

In an hour of a normal day, we recorded about 1,300 truck drivers using the AVC e-Channels at one of our Land Boundary crossing points i.e. Lok Ma Chau in that 22 AVC e-Channels are installed and is 24 hours operation.

22. What is the percentage of rejections for the first finger placement attempt?

Around 94% passengers can pass the fingerprint verification process in one attempt when using the e-Channel services. Those who are unable to pass the fingerprint verification progress in one attempt include some first time users or some users whose fingers are either too dry or too wet when performing the verification. Those with blurred fingerprints may also be unable to pass the fingerprint verification process in one attempt.

23. If you allow repeat biometric reading attempts, how many to you allow?

The number of attempts for fingerprint verification is 5.

24. What is the percentage of persons crossing the border that are unable to verify their fingerprint and thus, must be admitted through an exception handling process?

The rate is from 0.7% to 0.9%.