

SINGAPORE STANDARD

Specification for smart card reader application program interface (API)

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	Mr Alvin Ong	<i>Information Technology Management Association</i>
	Mr Wee Tew Lim	<i>Singapore Information Technology Federation</i>
Co-Opted Members	: Mr Chee Lai Yong	<i>Individual Capacity</i>
	Ms Diana Young	<i>Association of Small and Medium Enterprises</i>

The Technical Committee on Cards and Personal Identification appointed by the Information Technology Standards Committee and responsible for the preparation of this standard consists of experts from the following organisations:

	Name	Organisation
Chairman	: Mr Lin Yih	<i>Digital Applied Research & Technology Pte Ltd.</i>
Secretary	: Ms Kristy Chan	<i>Land Transport Authority</i>
Members	: Mr Bernard Cheong	<i>Gemplus Technologies Asia Pte Ltd</i>
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	Mr Lim Hwee Kwang	<i>Defence Science & Technology Agency</i>
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		Mr Philip Thong	<i>Giesecke & Devrient Asia Pte Ltd</i>
		Mr Benjamin Yeo Huat Chye	<i>Defence Science & Technology Agency</i>

The Reader API Working Group appointed by the Technical Committee to assist in the preparation of this standard comprises the following members:

	Name	Organisation
Convenor	: Mr Lim Hwee Kwang	<i>Defence Science & Technology Agency</i>
Members	: Mr Ang Boon Keong	<i>SCM Microsystems (Asia) Pte Ltd</i>
	Mr Bernard Cheong	<i>Gemplus Technologies Asia Pte Ltd</i>
	Mr Choo Yin Yeow	<i>ADC Technologies International</i>
	Mr Goh Sze Khee	<i>CISCO Computer Security</i>
	Mr Alson Khok	<i>Asis Technologies Pte Ltd</i>
	Mr Koh Kim Huat	<i>Ministry of Home Affairs</i>
	Mr Richard Lim	<i>Asis Technologies Pte Ltd</i>
	Mr Lin Yih	<i>Digital Applied Research & Technology Pte Ltd</i>
	Mr Paul Loke	<i>Gemplus Technologies Asia Pte Ltd</i>
	Mr Allan Phua	<i>SCM Microsystems (Asia) Pte Ltd</i>
	Mr Quek Han Lim	<i>Network for Electronic Transfer (S)</i>
	Mr Winstedt A Rasiah	<i>Land Transport Authority</i>
	Mr Ravinder Singh	<i>Netrust Pte Ltd</i>
	Mr Tan Keng Boon	<i>Advanced Card Systems Ltd</i>
	Mr Benjamin Yeo Huat Chye	<i>Defence Science & Technology Agency</i>

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Foreword

This Singapore Standard was prepared by the Technical Committee on Cards and Personal Identification under the direction of the Information Technology Standards Committee.

The SS 467 : 1999 'Specification for smart card reader APIs' was initiated at a time before PC/SC was established, and there was a need for standardisation. While that effort achieved some level of standardisation, it did not quite address multi reader and multi vendor support. This standard attempts to address these limitations, and at the same time, address the issue of running PC/SC readers on old applications. Most of the functionality and description in the standard are taken from the SS 467:1999 but is repeated and updated here. One new function **ListReaders** has been introduced to facilitate multi-reader support. This revision extends and replaces SS 467 : 1999.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

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Specification for smart card reader application program interface (API)

0 Introduction

This standard aims to provide:

- the means for old applications to interoperate with both the SS 467 : 1999 compliant smart card readers, as well as readers that comply with the PC/SC API standards. Therefore this extended standard provides the design and description for vendors to develop a *translator* from the SS 467 : 1999 to the PC/SC API.
- the means for old applications to manage multiple readers on one PC, regardless of whether they are SS 467 : 1999 compliant or PC/SC compliant.
- a guideline or model for developers for non-Windows based applications. PC/SC is primarily meant for Windows application but the SS 467 : 1999 compliant API, being simpler, is also suitable for other platforms like Unix (and other variants), embedded controllers that run on MS-DOS/PC-DOS or its variants.

This standard is not meant to compete or replace PC/SC. In fact if there is a need to write a new Windows based application, and the smart card readers selected are compliant with PC/SC API standard, then PC/SC API is the logical and best choice. This extended API is meant for adapting old applications to work with PC/SC compliant readers with little change, or needs to operate with both old (SS 467 : 1999) and new (PC/SC). At the same time, this extended standard can be used, in areas where PC/SC API does not apply.

This standard is aimed at Smart Card Reader (SCR) Suppliers who need to supply drivers, and application developers who need to develop software that operates with SCRs.

SCRs must comply with the following standards:

SS 372 : Part 1 : 1994/ ISO 7816-1: 1987	Specification for identification cards - Integrated circuit(s) cards with contacts Part 1 : Physical characteristics
SS ISO 7816-2 : 1988	Specification for identification cards - Integrated circuit(s) cards with contacts Part 2 : Dimensions and location of the contacts
SS 372 : Part 3 : 1995	Specification for identification cards - Integrated circuit(s) cards with contacts Part 3 : Electronic signals and transmission protocols

1 Background

SS 467 : 1999 comprises the following list of commands. They are listed in the typical usage sequence.

Table 1 – Functions available in SS 467 : 1999

S/N	Command	Description
1	InitDriver	Initialize reader in use
2	CardPresent	Check for card's presence
3	PowerOnCard	Apply power to the card (and obtain the Answer To Reset "ATR" response from the smart card)
4	Isoln	Send incoming ISO command to card
5	IsoOut	Send outgoing data to card
6	PowerOffCard	Disconnect power supply to the card
7	DoneDriver	Disconnect reader from port
8	ReaderParm	Returns reader's manufacturing information (if required)
9	ReaderPresent	Check for reader's presence (alternative to InitDriver)
10	ReaderSpeed	Change the communication speed of reader (if applicable)

For PC/SC, there are approximately 34 smart card and smart card reader related API functions. However, in terms of typical (minimal) usage, the list is much less and corresponds closely with SS 467:1999 (See Table 2).

Table 2 – PC/SC API functions that are frequently used

S/N	Command	Description
1	ScardEstablishContext	Establish a resource context with the smart card resource manager.
2	ScardConnect	Establish a connection with a particular reader. Typically, also powers up the reader.
3	ScardStatus	Determine the present status of the card, for example: absence or presence.
4	ScardTransmit	Sends data in or out of the smart card. Equivalent to Isoln and IsoOut and can be used for either direction.
5	ScardDisconnect	Terminates an established connection with a reader.
6	ScardFreeMemory	Frees any memory allocated by the smart card resource manager – for example as a result of SCardListReader (see 8 below).
7	ScardReleaseContext	Frees the context handle allocated by the smart card resource manager.
8	ScardListReaders	Returns a list of smart card readers installed, useful for multi-reader applications (if required).
9	ScardGetAttrib	Returns reader's attributes (if required).
10	ScardSetAttrib	Sets attributes for a reader. The list of attributes supported may vary from vendor to vendor and PC/SC does not specify completely.
11	ScardReconnect	Establishes the same effect as SCardConnect and it is used typically to obtain a Answer To Reset "ATR" response from the smart card.

PC/SC API documentation is a subset of the bigger Microsoft Platform SDK documentation, and it is covered under the “Smart Card Functions” section. The Platform SDK can be downloaded freely from the Microsoft website (www.microsoft.com).

NOTE – The exact URL may change from time to time, so it is advisable to do a search on that main website.

Given the similarity between the APIs, it is not difficult to build a “SS467 : 1999 to PC/SC” translator.

2 Scope

This standard describes the DLL routines and functions that must be supported by the software driver for a SCR.

The specification covers DLL versions available, functions that the DLL must support, the associated status and error return codes needed for the reader and application development rules that must be followed in building the DLL. The application development rules include structures declared in calling programs, size allocated for structures (including that for backward compatibility) and steps to communicate with the smart card via the reader, using API commands. Other functions that are required in the standard reader interface are also specified.

The syntax, description, parameters and return values of the API commands are also specified in the standard.