



Advanced Card Systems Limited

Product and Service Guide

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Contents

1. Company Background	3
2. ACS Products.....	4
2.1 Smart Cards	5
2.1.1 ACOS2 Microprocessor Card	5
2.1.2 ACOS3 Microprocessor Card	6
2.1.3 Contactless Cards.....	7
2.1.3.1 Mifare® 1K Contactless Card.....	7
2.1.3.2 Mifare® 4K Contactless Card.....	7
2.1.4 Memory Cards.....	8
2.1.4.1 SLE4442 Memory Card.....	8
2.1.4.2 SLE4428 Memory Card.....	8
2.1.4.3 SLE4436 Memory Card.....	8
2.2 PC-Linked Readers.....	9
2.2.1 ACR30 Smart Card Reader/Writer.....	9
2.2.2 ACR30D Dual Interface Smart Card Reader/Writer	10
2.2.3 ACR38 Smart Card Reader/Writer.....	11
2.2.4 ACR38U-CCID Smart Card Reader/Writer.....	12
2.2.5 ACR38F Floppy Bay Smart Card Reader.....	13
2.2.6 ACR38K Keyboard with Built-in Smart Card Reader.....	14
2.2.7 ACR38T SIMTracker III (Plug-in Card Reader)	15
2.2.8 ACR38DT DualKey	16
2.2.9 ACR38ET DualKey2	17
2.2.10 ACR91 PCMCIA Type II Smart Card Reader/Writer	18
2.2.11 AC1030 / AC1038 Reader Chipset.....	19
2.2.12 ACM30 / ACM38 - ACR30 / ACR38 Reader Modules	20
2.2.13 SDK-ACR38 - ACR38 Smart Card Reader Software Development Kit.....	21
2.3 Smart Card Balance Readers	22
2.3.1 ABR06BS / ABR08LS / ABR10RS - ACS Balance Readers	22
2.3.2 APG08LS - Dynamic Password Generator.....	23
2.3.3 ABR Balance Reader Sample Pack.....	24
2.4 Smart Card / Finger Print Readers	25
2.4.1 ADT60 BioSIMKey Fingerprint Scanner and Plug-in Smart Card Reader.....	25
2.4.2 AET60 BioCARDKey Fingerprint Scanner and Smart Card Reader	26
2.4.3 AET63 BioTRUSTKey Fingerprint Scanner and Smart Card Reader	27
2.4.4 SDK-ADT60 - ADT60 BioSIMKey Software Development Kit (SDK)	28
2.4.5 SDK-AET60 - AET60 BioCARDKey Software Development Kit (SDK).....	29
2.4.6 SDK-AET63 - AET63 BioTRUSTKey Software Development Kit (SDK).....	30
2.5 Smart Card Readers with PIN-pad	31
2.5.1 ACR88 Handheld Portable Smart Card Reader	31
2.5.2 SDK-ACR80 - Software Development Kit (SDK).....	33
2.6 Contactless Readers	34
2.6.1 ACR120 Contactless Smart Card Reader/Writer.....	34
2.6.2 SDK-ACR120 - ACR120 Contactless Smart Card Development Kit	35
2.7 Physical Access Control.....	36
2.7.1 ACM133 - Fingerprint Controller Module	36
2.7.2 EVK - ACM133 Evaluation Kit.....	37
2.8 GSM Management Tools	38
2.8.1 SIMmate.....	38
2.8.2 SIMC01 - SIMcopier.....	40
2.9 PC-linked Readers with Flash Storage.....	41
2.9.1 ACR100 SIMFlash	41
3. ACS services.....	42
3.1 Product Customization	42
3.2 Consultancy and Training	43

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1. Company Background

Advanced Card Systems Ltd. (ACS), a listed company on the Hong Kong Stock Exchange, is a leading developer and producer of smart cards, card readers and security hardware such as biometric devices and logical and physical access control devices. ACS has won its reputation as a supplier of quality products at reasonable prices. Its products are sold to over 80 countries in the world. It is ranked in Year 2003 by Frost and Sullivan as the world's 4th largest supplier of smart card readers and is ranked first among Asian suppliers. ACS is specialized in developing customized products and has co-operated with several global players in developing such products.

Founded in 1995, Advanced Card Systems Ltd. (ACS) started its business as a developer of smart card and card reader technologies. Then its business has been extended to security hardware including biometric devices and logical and physical access control devices.

ACS always endeavours to keep itself abreast of technology development in its core products and services. It is the world's first company to introduce the PC/SC compliant USB smart card reader, back in 1999 in CeBIT in Hannover. It is also the world's first company to have a reader based on a single-ASIC solution compliant to EMV level I (Europay, MasterCard, Visa) standard.

ACS products are sold to over 80 countries in the world. In particular, its smart card readers have been qualified and used by the world's top six smart card suppliers. ACS won the "Growth Strategy Leadership Award" by Frost & Sullivan for its outstanding performance in the world smart card reader market in 2002.

In 2005, ACS has been awarded by Frost & Sullivan, through the D'ucoty Awards, the **Product Innovation Award for Readers** in the South East Asian region. It was an award that recognized ACS as a top industry player in South East Asia in the smart card arena.

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2. ACS Products

ACS products are divided into eight main product lines:

1. Smart Cards
2. PC-linked Readers
3. Smart Card Balance Readers
4. Smart Card / Finger Print Readers
5. Smart Card Readers with Pin-pad
6. Contactless Readers
7. Physical Access Control Devices
8. GSM Management Tools

2.1 Smart Cards

2.1.1 ACOS2 Microprocessor Card



ACOS2
[smart card format]



ACOS2
[plug-in card format]

Suitable to be used:

- In payment systems
- In secure access control
- As identity card
- In customer loyalty program
- As campus card, clubs card, etc.

Supplied as:

- License of software
- Module
- Card

Features

- EEPROM for user data: 1K, 8K
- Compliant with ISO-7816-1/2/3, T=0
- DES (and triple DES optional) and MAC capability for very high security level
- Mutual authentication with random numbers and dedicated key pair
- Five secret codes + Issuer Code + Pin to selectively enable access to data stored in card and to features and functions provided by the card, e.g., the READ and WRITE commands
- Issuer definable file management for convenient and efficient memory management
- Dedicated data structure for payment applications with CREDIT, DEBIT, INQUIRE ACCOUNT commands for secure transaction processing

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2.1.2 ACOS3 Microprocessor Card



Suitable to be used:

- In payment systems
- In secure access control
- As identity card
- In customer loyalty program
- As campus card, clubs card, etc.



Supplied as:

- License of software
- Module
- Card

Features

- EEPROM for user data: 8K, 16K, 32K
- Compliant with ISO-7816-1/2/3, T=0
- DES (and triple DES optional) and MAC capability for very high security level
- Mutual authentication with random numbers and dedicated key pair
- Five secret codes + Issuer Code + Pin to selectively enable access to data stored in card and to features and functions provided by the card, e.g., the READ and WRITE commands
- Issuer definable file management for convenient and efficient memory management
- Dedicated data structure for payment applications with CREDIT, DEBIT, INQUIRE ACCOUNT commands for secure transaction processing

2.1.3 Contactless Cards

ACS also offers contactless MIFARE® cards that may be used with their contactless smart card readers/writers. The available contactless cards are the MIFARE® 1K and MIFARE® 4K cards.

2.1.3.1 Mifare® 1K Contactless Card



Supplied as:

- Card

Feature:

- 1K byte EEPROM
- Embedded antenna
- MIFARE® 13.56 MHz ISD 14443A
- The range of operation is typically from about 2.5" to 3.9"

2.1.3.2 Mifare® 4K Contactless Card



Supplied as:

- Card

Feature:

- 4K bytes EEPROM
- Embedded antenna
- MIFARE® 13.56 MHz ISD 14443A
- The range of operation is typically from about 2.5" to 3.9"

2.1.4 Memory Cards

ACS offers a variety of memory cards that may be used with their various smart card readers/writers. These are the SLE4428, SLE4436, and SLE4442 memory cards.

2.1.4.1 SLE4442 Memory Card

**Supplied as:**

- Card

Features:

- Intelligent 256-bytes EEPROM
- Write-protect function
- Programmable Security Code (PSC)
- EEPROM is organized 1024 x 8 bit offering the possibility of programmable write protection for each byte
- Data can only be changed after entry of the correct 3-byte programmable security (security memory)

2.1.4.2 SLE4428 Memory Card

**Supplied as:**

- Card

Features:

- 1K byte EEPROM
- Write-protect function
- Programmable Security Code verification logic
- All the memory, except for the PSC, can always be read
- The memory can be written or erased only after PSC verification
- After eight successive incorrect entries the error counter will block any subsequent attempt at PSC verification and hence any possibility to write and erase

2.1.4.3 SLE4436 Memory Card

**Supplied as:**

- Card

Features:

- Intelligent 221-bit counter memory card
- High security authentication and security logic
- Irreversible chip coding
- Support for anti-tearing

2.2 PC-Linked Readers

2.2.1 ACR30 Smart Card Reader/Writer



ACR30 Smart Card Reader/Writer

The ACR30 is a compact and cost-effective reader which supports all microcontroller cards with T=0 or T=1 protocols as well as the popular memory cards in the market today. It supports smart cards that conform to ISO-7816-1/2/3 standard. The ACR30 is Microsoft PC/SC compliant and supports all major PC platforms.

Being a single chip solution with EMV level 1 certified, this reader is one of the most cost effective solutions for banking, e-commerce, information security, computer access control, electronic identification, and other smart card applications. The ACR30 smart card reader/writer can be connected to the computer through a serial asynchronous interface (RS-232) or USB interface. ACR30 has an optional built-in Security Access Module (SAM) slot that supports various high security applications. Other casing designs are also available.

Features

- Read and write all microprocessor cards (MCU) with T=0, T=1 protocols
- Read and write popular memory card types
- Certificate of conformance: PC/SC, CE, FCC, Microsoft WHQL, EMV Level 1, NETS
- Support smart cards that conform to ISO-7816-1/2/3 standard
- Support commonly used memory cards (I2C, SLE4406/4436/5536, SLE4418/28, SLE4432/42)
- Support PPS (Protocol and Parameters Selection) with 9600 – 96000 bps in reading and writing smart cards
- RS-232 interface or USB interface to PC with simple command structure

Supported card types

MCU Cards

- The ACR30 can operate MCU card with T=0, T=1 protocol

Memory-based smart cards (synchronous interface)

- '104' type EEPROM non-reloadable token counter cards, including: GPM103, SLE 4406, SLE5536, ST1305
- Cards following the I²C bus protocol (free memory cards) such as Atmel AT24C01/02/04/08/16, ST-Microelectronics ST14C02C, ST14C04C
- SLE4432/4442 intelligent 256 bytes EEPROM with write-protect function
- SLE 4418/4428 intelligent 1K bytes EEPROM with write-protect function

Technical specification

Interface	RS-232 (Serial) or USB
Supply Voltage	Regulated 5V DC
Supply Current	< 100mA (without smart card)
Operating Temperature	0 - 50° C
Physical Dimensions	67.0mm (L) x 91.6mm (W) x 16.9mm (H)
CLK Frequency	3.68 / 4 MHz
Standards / Certifications	ISO-7816-1/2/3 (interface), PC/SC, CE, FCC, EMV Level 1, NETS
Operating System Support	Windows 98, Me, NT (serial), 2K and XP, Linux, and MAC OS X; No NT4 for ACR30 USB

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2.2.2 ACR30D Dual Interface Smart Card Reader/Writer



ACR30D Dual interface reader

ACR30D is a dual interface smart card reader, which can be connected via USB or serial RS-232 interface to the PC.

Similar to ACR30, ACR30D is a compact, cost-effective, single chip reader which supports all microcontroller cards with T=0 or T=1 protocols as well as the popular memory cards in the market today.

ACR30D supports smart cards that conform to ISO-7816-1/2/3 standard. It is also Microsoft PC/SC compliant and supports all major PC platforms. Other casing designs are also available.

Advantages

- System operators and application providers (such as banks) can distribute readers to end users without knowing which interface the customer wants
- Users can continue to use the serial interface today and switch to USB interface as they upgrade the PC in the future

Easy installation

- Plug in the USB interface to activate the USB interface
- Plug in the serial interface to activate the serial Plug and Play interface
- Plug in both interfaces will then activate the default serial Plug and Play interface

Features

- Read and write all microprocessor (MCU) cards with T=0, T=1 protocols
- Read and write popular memory card types
- Support smart cards that conform to ISO-7816-1/2/3 standard
- Support commonly used memory cards (I2C, SLE4406/4436/5536, SLE4418/28, SLE4432/42)
- Support PPS (Protocol and Parameters Selection) with 9600 – 96000 bps in reading and writing smart cards

Supported card types

- Same as ACR30

Technical specification

Interface	Dual interface (Serial or USB)
Supply Voltage	Regulated 5V DC
Supply Current	< 100mA (without smart card)
Operating Temperature	0 - 50° C
Physical Dimensions	67.0mm (L) x 91.6mm (W) x 16.9mm (H)
CLK Frequency	3.68 / 4 MHz
Standards / Certifications	ISO-7816-1/2/3 (interface), CE, FCC
Operating System Support	Windows 98, Me, NT (serial), 2K and XP, Linux, and MAC OS X

2.2.3 ACR38 Smart Card Reader/Writer



With the continuing evolution of personal computing standards, the ACR38 smart card reader/writer is a USB full speed device designed for use in the PC environment.

This reader series combines a modern design with the latest technology, and makes it a suitable solution for demanding environments. The ACR38 is ideal for use in network security, electronic payment systems, electronic identifications as well as other advanced smart card applications. ACR38 has an optional built-in Security Access Module (SAM) slot that supports various high security applications. Other casing designs are also available.

Features

- USB full speed interface to PC with simple command structure
- Read and write all microprocessor cards with T=0, T=1 protocols
- Supports most common memory-based smart cards, including I2C bus protocol cards (from 1K bits up to 1024K bits) and secure memory cards (Atmel AT88SC153, AT88SC1608, SLE4418/28, SLE4432/42)
- Short Circuit Protection
- Certificate of conformance: EN 60950/IEC 60950, PC/SC, CE, FCC, Microsoft WHQL, EMV Level 1
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Support PPS (Protocol and Parameters Selection) with 1743–307200 bps in reading and writing smart cards

Technical specification

Interface	Full speed USB
Supply Voltage	Regulated 5V DC
Supply Current	< 100mA (without smart card)
Operating Temperature	0 - 50° C
Physical Dimensions	73.0mm (L) x 96.5mm (W) x 19.0mm (H)
CLK Frequency	4 MHz
Standards / Certifications	EN 60950/IEC 60950, ISO-7816 (interface), PC/SC, CE, FCC, EMV Level 1
Operating System Support	Windows 98, Me, NT, 2K and XP

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2.2.4 ACR38U-CCID Smart Card Reader/Writer



Due to the rising demand of e-working methods (remote office, intranet, extranet and home office) and the increasing risk of unauthorized access to private network, it is time to properly secure access to PCs, desktops, and the Intranet and Extranet networks. ACR38 offers solutions based on smart card readers (connected to PCs) for access control.

Now, reinforced with CCID compliance, the ACR38U-CCID offers a driverless solution saving you the hassle of driver installation and driver-system compliance checking.

This CCID compliant smart card reader/writer is a USB full speed device, which is the interface for the communication between a computer and a smart card. It is designed for the PC environment, and is the ultimate smart card peripheral for a PC.

ACR38U-CCID is a key partner of the PC as smart card is becoming an essential component in network security and electronic payment system. It is a low cost, yet reliable and effective smart card-to-PC interface with design focusing on convenient use and harmony with other PC peripherals in shape and color. It also provides the solution where the security of a smart card is required. It can be used as access control to a computer or network, authentication for e-commerce (B to B, B to C). It is also very simple to use and install. It is ideal for electronic commerce, home banking or e-purse facilities, secure computer access or any of a multitude of other applications.

Features

- USB full speed interface to PC with simple command structure
- Reads and writes all microprocessor cards with T=0 or T=1 protocols
- Short Circuit Protection
- Conforms with: EN 60950/IEC 60950, ISO-7816, PC/SC, CE, FCC, USB Full Speed, Microsoft WHQL, EMV Level 1
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Supports PPS (Protocol and Parameters Selection) with 1,743 – 250,000 bps in reading and writing smart cards

Technical specification

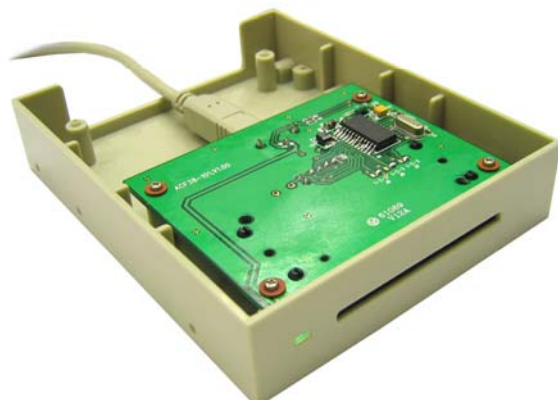
Interface	USB full speed
Supply Voltage	Regulated 5V DC
Supply Current	< 50mA
Operating Temperature	0 - 50° C
CLK Frequency	4 MHz
Standard	EN 60950/IEC 60950, CCID, EMV Level 1, ISO-7816, PC/SC, CE, FCC, USB Full Speed, Microsoft WHQL 2K, XP
Operating System Support	Windows 2K, XP (Can be used on Windows 98, ME, coupled with the drivers downloadable from our website)

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2.2.5 ACR38F Floppy Bay Smart Card Reader



The ACR38F is the ideal solution for easy integration of a smart card reader into the desktop environment. It uses the same electronic circuit as the ACR38, and has the same versatility and cost-effectiveness that have always been associated with ACS smart card readers. Using the USB interface, it uses the PC's internal power supply, and can be configured in several ways to suit the customer's preference.

Similar to ACR38, ACR38F Floppy Bay Smart Card Reader is also very simple to use and to install. It is ideal for electronic commerce, home banking or e-purse facilities, secure computer access or any of a multitude of other applications.

Features

- USB full speed interface to PC with simple command structure
- Read and write all microprocessor cards with T=0 or T=1 protocols
- Supports SLE 4418/28/32/42 memory cards
- Supports most common memory-based smart cards, including I2C bus protocol cards (from 1k bits up to 1024k bits) and secure memory cards (Atmel AT88SC153 and AT88SC1608)
- Short Circuit Protection
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Support PPS (Protocol and Parameters Selection) with 1743 – 250000 bps in reading and writing smart cards

Technical specification

Interface	USB full speed
Supply Voltage	Regulated 5V DC
Supply Current	< 50mA
Operating Temperature	0 - 50° C
CLK Frequency	4 MHz
Standard	ISO-7816, T=0 and T=1
Operating System Support	Windows 98, ME, 2K, XP, NT

2.2.6 ACR38K Keyboard with Built-in Smart Card Reader



The ACR38K Multimedia Keyboard offers you with specialized keyboard setting, accessing every function in just one key-press, plus a classy multimedia controller. This package also comes with a card reader that enables you to easily implement smart card-based systems. The ACS smart card readers utilize the latest advancement of microchip technology, that brings you high security for your confidential files in a convenient and easy to carry microchip smart card. The software drivers and tools in this package will enable you to write files to your smart card and to read the contents.

so that nobody can erase or overwrite the files.

You can also write protect the contents of your smart card

Combined with our versatile smart card reader/writer, using the ACR38 module, the keyboard is transformed into a highly powerful component for security, e-commerce, and other applications.

Keyboard features

- USB interface with 18 multimedia hot keys support (back, forward, stop, refresh, search, favorites, home, mute, volume-, volume+, previous track, stop, play, next track, media, calculator, my computer)
- 4 programmable keys
- ACPI power management key support: power, sleep and wake up
- Fixed wrist rest

Smart card reader features

- USB full speed interface to PC with simple command structure
- Read and write all microprocessor cards with T=0 or T=1 protocols
- Supports SLE 4418/28/32/42 memory cards
- Supports most common memory-based smart cards, including I2C bus protocol cards (from 1k bits up to 1024k bits) and secure memory cards (Atmel AT88SC153 and AT88SC1608)
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Short Circuit Protection
- ISO-7816 compatible smart card interface
- EN 60950/IEC 60950, EMV Level 1, ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards, PC/SC, CE, FCC, Microsoft WHQL 2K, XP
- Support PPS (Protocol and Parameters Selection) with 1,743 – 250,000 bps in reading and writing smart cards

Technical specification

Interface	USB full speed
Supply Voltage	Regulated 5V DC
Key Numbers	108/109/113 (US/EU/JP)
Keyboard Dim. (Mm)	475(L) x 254 (W) x 50(H)
Operating Temperature	0 - 40° C
Switch Reliability	10 million cycles
Standards / Certifications	EN 60950/IEC 60950, EMV Level 1, ISO-7816 Class A, B and C (5V, 3V, 1.8V) cards, PC/SC, CE, FCC, Microsoft WHQL 2K, XP
Operating System Support	Windows 98, ME, 2K, XP, NT

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2.2.7 ACR38T SIMTracker III (Plug-in Card Reader)



Due to the rising demand of e-working methods (remote office, home office...) and the increasing risk of unauthorized access to private network, it is time to properly secure access to PCs, desktops, and the Intranet and Extranet networks. ACR38 offers solutions based on smart card readers (connected to PCs) for access control.

The ACR38 smart card reader/writer is a USB full speed device, which is the interface for the communication between a computer and a smart card. It is designed for the PC environment, and is the ultimate smart card peripheral for a PC.

ACR38 is a key partner of the PC as smart card is becoming an essential component in network security and electronic payment system. Providing secured network computing environment by its data encryption function, the SDK package allows users to easily develop their own application to best meet the specific system needs.

ACR38 is a low cost, yet reliable and effective smart card-to-PC interface with design focusing on convenient use and harmony with other PC peripherals in shape and color. It also provides the solution where the security of a smart card is required. It can be used as access control to a computer or network (intranet, extranet, etc), authentication for e-commerce (B to B, B to C), etc. It is also very simple to use and install. It is ideal for electronic commerce, home banking or e-purse facilities, secure computer access or any of a multitude of other applications.

Features

- USB full speed interface to PC with simple command structure
- Support Plug-in SIM-sized card
- Read and write all microprocessor SIM-sized cards with T=0 or T=1 protocols
- Support SLE 4418/28/32/42 memory cards
- Support most common memory-based smart cards, including I2C bus protocol cards (from 1k bits up to 1024k bits) and secure memory cards (Atmel AT88SC153 and AT88SC1608)
- Support GSM 11.11 specification
- Require no additional cable
- Short Circuit Protection
- Conform with: EN 60950/IEC 60950, ISO-7816, PC/SC, Microsoft WHQL, EMV Level 1, USB Full Speed
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Support PPS (Protocol and Parameters Selection) with 1,743 – 250,000 bps in reading and writing smart cards

Technical specification

Interface	USB full speed
Supply Voltage	Regulated 5V DC
Supply Current	< 50mA
Operating Temperature	0 - 50° C
CLK Frequency	4 MHz
Physical Dimensions	78.73mm (L) x 21.50mm (W) x 11.00mm (H)
Standards / Certifications	EN 60950/IEC 60950, EMV Level 1, USB Full Speed, ISO-7816, PC/SC, Microsoft WHQL 2000, XP
Operating System Support	Windows 98, Me, 2K and XP, XP SP1a, XP SP 2

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2.2.8 ACR38DT DualKey



Due to the rising demand of e-working methods (remote office, home office...) and snowballing hacking likeliness, it is the time to properly secure access to PCs, desktops, Intranet & Extranet networks and physical access control. ACR38DT offers both solutions based on SIM-sized **combi smart card** (contactless and contact card) for logical and physical access control.

The ACR38DT Contactless/Contact DualKey is an extension of ACR38T SIMTracker II. It has full ACR38T functionalities with contactless value-added feature.

i) Serves as a plug-in (SIM-sized) card reader:

It is an extremely compact USB full speed device completely compatible with the ACR38 smart card reader and is designed to access SIM-sized smart cards (Plug-in card). With a size of only

78.73 mm x 21.50 mm x 11.00 mm, the ACR38DT is highly suitable for portable applications, as it plugs into the USB port and requires no additional cable or wiring. It also fulfils the GSM 11.11 specification. It is designed for PC environment, ultimate smart card peripheral for a PC.

ii) Serves as a contactless card:

While the ACR38DT serves as a contactless card, the embedded antenna coil enables the contactless part of the SIM-sized combi card to work as a contactless card to communicate with contactless readers.

ACR38DT DualKey is a good quality, reliable and effective reader with designs focusing on convenient use and harmony with other PC peripherals in terms of shapes and colors. It is ideal for electronic commerce, physical access control, home banking or e-purse facilities, secure computer access, transportation and GSM application tool.

Features

- **USB full speed** interface to PC with simple command structure
- Support Plug-in SIM-sized card
- Read and write all microprocessor cards with T=0 or T=1 protocol
- Support SLE 4418/28/32/42 memory cards
- Support the most common memory-based smart cards, including **I2C bus protocol cards** (from 1k bits up to 1024k bits) and secure memory cards (**Atmel AT88SC153** and **AT88SC1608**)
- Support GSM 11.11 specification
- Require no additional cable
- Short Circuit Protection
- EN 60950/IEC 60950, ISO-7816, PC/SC, CE, FCC
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Embedded antenna coil
- Full functionality with SIM-sized Combi card in contact and contactless interface
- Support PPS (Protocol and Parameters Selection) with 1,743 – 250,000 bps in reading and writing smart cards
- A patented technology combines physical and logical access control capabilities

Technical specification

Interface	USB full speed
Supply Voltage	Regulated 5V DC
Supply Current	< 50mA
Operating Temperature	0 - 50° C
CLK Frequency	4 MHz
Physical Dimensions	78.73mm (L) x 21.50mm (W) x 11.00mm (H)
Operating System Support	Windows 98, ME, 2K, XP

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2.2.9 ACR38ET DualKey2



To effectively deter hacking or unauthorized access to company assets, a need for an effective device to guard the physical and logical access is imminent. With ACR38ET, you can safeguard the access to PCs, desktops, Intranet & Extranet networks, physical doors, safes, databanks... etc, with supreme confidence. With that power, ACR38ET is astonishingly simple – having innate contactless card functionalities and requiring simply a SIM-sized smart card for contact card functionalities.

The ACR38ET DualKey2 is an extension of ACR38T SIMTracker II. It has full ACR38T functionalities with contactless value-added feature.

i) Serves as a plug-in (SIM-sized) card reader:

It is an extremely compact USB full speed device completely compatible with the ACR38 smart card reader and is designed to access SIM-sized smart cards (Plug-in card). With a size of only 78.73 mm x 21.50 mm x 11.00 mm, the ACR38ET is highly suitable for portable applications, as it plugs into the USB port and requires no additional cable or wiring. It also fulfils the GSM 11.11 specification. It is designed for the PC environment, and is an ultimate smart card peripheral for a PC.

ii) Serves as a contactless card:

While the SIM-sized card enables the contact card security benefits, the ACR38ET is virtually a Mifare® card token. Make use of this feature, and you may benefit from the speed and convenience contactless technologies can bring.

Since the contact card information is stored in the SIM card, while the contactless card information is stored in the ACR38ET itself, you can have a highly secure system based on data storage segregation.

ACR38ET DualKey2 is a good quality, reliable and effective reader with designs focused on convenient use and harmony with other PC peripherals in terms of shapes and colors. It is ideal for electronic commerce, physical access control, home banking or e-purse facilities, secure computer access, transportation and GSM application tool.

Features

- **USB full speed** interface to PC with simple command structure
- Support Plug-in SIM-sized card
- Read and write all microprocessor cards with T=0 or T=1 protocol
- Support SLE 4418/28/32/42 memory cards
- Support the most common memory-based smart cards, including **I2C bus protocol cards** (from 1k bits up to 1024k bits) and secure memory cards (**Atmel AT88SC153 and AT88SC1608**)
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Support GSM 11.11 specification
- Require no additional cable
- Short Circuit Protection
- EN 60950/IEC 60950, ISO-7816, PC/SC, CE, FCC
- Support PPS (Protocol and Parameters Selection) with 1,743 – 250,000 bps in reading and writing smart cards

Technical specification

Interface	USB full speed
Supply Voltage	Regulated 5V DC
Supply Current	< 50mA
Operating Temperature	0 - 50° C
CLK Frequency	4 MHz
Standard/Specifications	EN 60950/IEC 60950, ISO-7816, PC/SC
Operating System Support	Windows 98, ME, 2K, XP

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2.2.10 ACR91 PCMCIA Type II Smart Card Reader/Writer



ACR91 PCMCIA smart card reader is a compact reader designed for PDAs, notebooks, and portable computers with PCMCIA interface.

The ACR91 is designed to meet all major standards like PC/SC, ISO-7816, GSM 11.11, Home Banking Computer Interface (HBCI), the PC- 2001 Specification.

The ACR91 establishes a uniform interface between the computer and the smart card for a wide variety of cards. The software engineers need not to understand the full technical details of the smart card/computer interface to carry out implementation of a smart card system.

Features

- Read and write all microprocessor cards (MCU) with T=0 and T=1 protocols
- Support 1.8V, 3V and 5V smart cards
- Certificate of conformance: ISO-7816-1/2/3, PC/SC, CE, HBCI
- ISO-7816-1/2/3 compatible smart card interface
- Transmission speed (with PC: 16Mbit/sec)
- Transmission speed (with Card: up to 420Kbit/sec)
- Win 98/ME/NT4/2000/XP/CE3.0/CE.NET
- 4 MHz/8MHz CLK frequency
- 8 sliding contacts (8 contacts)
- Min 30,000 card insertion cycles
- Microsoft PC/SC compliant application programming interface
- Stainless steel case material
- 43g weight
- PCMCIA mechanical specifications, ISO-7816/1

Technical specification

Interface	PCMCIA, Plug and Play support
Supply voltage	Regulated 5V DC
CLK Frequency	4 MHz/8MHz
Standards / Certifications	ISO-7816-1/2/3 (interface), PC/SC, CE, HBCI
Operating System Support	Windows 98, ME, 2000, XP, NT4.0, and CE3.0/CE.NET

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2.2.11 AC1030 / AC1038 Reader Chipset

AC1030 chipset is used in the ACR30 smart card reader series.

Features

- ISO-7816 compatible smart card interface
- Supports most common memory-based smart cards (SLE4406, SLE4418/4428, SLE4432/4442 and I2C cards with memory 1k-16k bits)
- Supports CPU-based cards with T=0, T=1 protocol
- Automatic detection memory-based card or MCU-based card
- Power up/down sequence compatible to ISO-7816 for signal integrity
- Automatic detection of card insertion and removal
- Serial or USB (low speed at 1.5Mbps) interface to host computer with simple command structure
- 34-Pin SOIC for AC1030
- Operating temperature range: 0°C to 70°C (AC1030)
- Power supply at 4.0V – 5.25V

AC1038 chipset is used in the ACR38 smart card reader series.

Features

- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Supports most common memory-based smart cards (SLE4418/4428, SLE4432/4442, I2C cards with memory 1k-1024k bits, AT88SC1608 and AT88SC153)
- Supports CPU-based cards with T=0, T=1 protocol
- Automatic detection memory-based card or MCU-based card
- Power up/down sequence compatible with ISO-7816 for signal integrity
- Automatic detection of card insertion and removal
- USB (full speed at 12Mbps) interface to host computer with simple command structure
- 24-Pin SOIC for AC1038
- Operating temperature range: 0°C to 70°C (AC1038)
- Power supply at 4.0V – 5.25V

* Note that AC1030 / AC1038 are the product numbers used by ACS and they will not be printed on the reader chipset.

2.2.12 ACM30 / ACM38 - ACR30 / ACR38 Reader Modules



**ACM30 /ACM38 reader
modules**

The ACR30 / ACR38 can be supplied in module form - ACM30 / ACM38. This is an ideal solution for integrating smart card access into any application. The module retains the full functionalities of the reader/writer, and can be easily integrated into payphones, parking meters, vending machines, laundries, gaming machines, ATM's, sophisticated access control systems, etc. The ACM30 comes with either the serial or USB connection whereas the ACM38 only comes with USB connection.

Note that the connector type that comes with the reader module can be customized. The standard package is with no connector. Sliding and landing connectors are customized options.

2.2.13 SDK-ACR38 - ACR38 Smart Card Reader Software Development Kit



ACR38 SDK is a complete package containing all the vital components required for smart card application development. It provides developers with a convenient and effective way to incorporate smart cards into their solutions.

Reflecting ACS expertise in smart card technologies, the development kit is a complete package containing all the vital components required for MCU-based and memory-based smart card application development, which is suitable for both beginners and experienced developers.

It is also an ideal training and development tool for those who would like to know more about MCU-based and memory-based smart card technologies. Software development companies can use the kit to develop systems specific to their requirements to meet customers' demanding needs or to incorporate various contactless smart card technologies into their current applications.

Package Contents

- 1 x ACR38 Smart Card Reader
- 1 x ACR38T SIMTracker SIM-sized plug-in Smart Card Reader
- 1 x ABR08LS 8-digit Balance Reader
- 5 x ACOS2 8Kbyte microprocessor-based smart cards
- 5 x ACOS2 SIM-size plug-in 8Kbyte microprocessor-based smart cards
- 5 x SLE 4428 memory-based smart cards
- 5 x SLE 4442 memory-based smart cards
- Installation CD-ROM (including drivers, sample codes, utility tools and demo software)
- SDK User manual

Features

- **USB full speed** interface to PC with simple command structure
- Read and write all microprocessor cards with T=0 or T=1 protocols
- Supports SLE 4418/28/32/42 memory cards
- Supports most common memory-based smart cards, including **I2C bus protocol cards** (from 1k bits up to 1024k bits) and secure memory cards (**Atmel AT88SC153** and **AT88SC1608**)
- Short Circuit Protection
- Certificate of conformance: EN 60950/IEC 60950, ISO-7816, PC/SC, CE, FCC, Microsoft WHQL, EMV certified
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Support PPS (Protocol and Parameters Selection) with 1743 – 307200 bps in reading and writing smart cards
- 768 bytes RAM size and 16K bytes ROM size
- SDK contains all the vital components required for MCU-based and memory-based smart card application development
- SDK designed for both novice and experienced developers

Technical specification

Interface	USB
Supply Voltage	Regulated 5V DC
Supply Current	Max. 50 mA
Operating Temperature	0 - 50° C
Physical Dimensions	97mm (L) x 72mm (B) x 18.5mm (H)
Smart Card Read/Write Speed	1743 – 307200 bps
Standards / Certifications	EN 60950/IEC 60950, EMV Level 1, ISO-7816, PC/SC, CE, FCC, Microsoft WHQL ME, 2K, XP
Card Type Support	Support ISO-7816 Class A, B and C (5V, 3V, 1.8V) cards Supports I2C bus protocol cards (from 1k bits up to 1024k bits) and secure memory cards (Atmel AT88SC153 and AT88SC1608), also supports SLE 4418/28, 4432/42.

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2.3 Smart Card Balance Readers

2.3.1 ABR06BS / ABR08LS / ABR10RS - ACS Balance Readers



ABR06BS (6-digits)

ABR08LS (8-digits)

ABR10RS (10-digits)

These balance readers are portable devices that can be configured for use in various applications such as simple balance checking, currency conversion, viewing transaction records, identity verification, campus environments (class attendance, library record, etc.) and more. They can be made to support ordinary phone cards, Visa Cash, Mondex, and other memory or microprocessor cards as required by customers.

ABR06BS: ACS Balance Readers with 6-digit display, book shape
The standard device has a 6 numeric display

ABR08LS: ACS Balance Readers with 8-digit display, leaf shape
The standard device has an 8 numeric display

ABR10RS: ACS balance Readers with 10 digits of display, ruler shape (longer LCD)
The standard device has a display for 4 alphanumeric and 6 numeric display

We can also customize the number of display digits, alphanumeric display, casing design, logo printing, supported cards, supported languages, etc. to meet customers' specific needs and requirements.

Features

- Key-chain Pocket-sized
- Stylish casing design
- Long lasting replaceable battery
- Configurable front button (ABR08LS only)
- Automatic display upon card insertion
- Support multiple information display
- Support majority of memory and/or MCU cards as required by customers

Technical specification

Power Supply	2 pieces of 3V lithium batteries; replaceable
Card connector	Sliding contacts
LCD Display	Choice of 6, 8, 10 or 16 digits
Physical Dimensions	ABR06BS: 62.0 mm (L) x 34.0 mm (W) x 9.0 mm (H) ABR08LS: 72.3 mm (L) x 42.3 mm (W) x 12.5 mm (H) ABR10RS/ABR16RS: 71.9 mm (L) x 30.4 mm (W) x 13.0 mm (H)
Weight	~22 grams
Operating Temperature	0 - 50° C
Standards / Certifications	CE, FCC

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2.3.2 APG08LS - Dynamic Password Generator



This dynamic password generator is compact and is used with a SIM-sized smart card. It can be used with a user's normal login and password for two-factor authentication, and therefore it is suitable for use in security applications. An identical password list can be stored in both the smart card and the server, and then the matching of the two passwords can be used for authentication purposes.

This highly portable balance reader comes with 8-digits for display as standard but we can also customize the casing design, logo printing, number of display digits, alpha-numeric display, etc. to meet your specific needs and requirements.

Features

- Key-chain, pocket-sized
- Stylish casing design
- Long lasting replaceable battery
- Support multiple information display

Technical specification

Power Supply	2 pieces of 3V lithium batteries; replaceable
Card connector	Sliding contacts
LCD Display	8-digit numeric display
Operating Temperature	0 - 50° C
Standards / Certifications	CE, FCC

2.3.3 ABR Balance Reader Sample Pack



ABR balance reader can be used for checking the balance in your electronic purse card (e.g. Visa Cash, Mondex, Gemplus cash card, Proton card, prepaid phone cards (e.g. Eurochip 4436), etc.

You can also view the latest transactions on your card and use the balance reader to show user information such as name and telephone number. Adding a balance reader in your smart card project increases the attractiveness and effectiveness of your project.

The balance reader is also available for custom branding for promotional purposes. OEM & ODM enquiries are welcome. Colors can be easily defined, and your own logo or design can be printed. Our balance readers can be easily customized to satisfy customer requirements (cards supported, display content, color, casing, buttons, etc.)

Package Contents

ABR06BS

- 6-digit numeric LCD
- Operation temperature: 0° to 50 °C
- Certificate of conformance: CE, FCC

ABR10RS

- 10-digit (4 alphanumeric & 6 numerals) LCD
- Operation temperature: 0° to 50 °C
- Certificate of conformance: CE, FCC

6 x Test cards

- 3 x ACOS2 microprocessor-based card (For ABR10RS)
- 3 x Prepaid phone card (For ABR06BS)

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2.4 Smart Card / Finger Print Readers

2.4.1 ADT60 BioSIMKey Fingerprint Scanner and Plug-in Smart Card Reader



ADT60 BioSIMKey

Combining the functions of ACS' versatile ACR30 reader and UPEK's patented TouchChip technology, the BioSIMKey is a compact USB device that can scan fingerprints and accept plug-in (SIM-sized) smart cards. (UPEK is a subsidiary of STMicroelectronics, ST) By using fingerprints to replace passwords or PINs, this device harnesses the power of biometrics and smart cards, and provides a highly secure, yet convenient and affordable authentication process. It is an ideal solution for a wide range of security-dependent applications.

Using a simple Application Programming Interface (API), it is extremely easy for designers to integrate the fingerprint authentication features into their applications. The developer can develop the interface very quickly without an in-depth knowledge of

biometrics.

Fingerprint Scanner

- High-resolution 508 DPI imaging
- Utilizes UPEK's patented TouchChip technology, resulting in high quality fingerprint images in any environment

Smart Card Reader

- Support smart cards that conform to ISO-7816 standard
- PC/SC compliant
- Support all micro-controller cards, with T=0, T=1 protocols

Security Features Possible

- Encrypted finger print template stored inside smart card
- Session key generation among smart card, BioSIMKey Processor and host computer
- Unique bonding between the smart card and BioSIMkey

Typical Applications

- Remote electronic voting
- Secured e-commerce
- Secure home banking
- Computer system logon

Technical specification

Interface	USB
Supply Voltage	Regulated 5V DC (USB powered)
Active Sensor Size	12.8 mm x18.0 mm
Array Size	256 x 360 pixels
Image Resolution	508 DPI
Physical Dimensions	71.5 mm (L) x 32.0 mm (W) x 16 mm (H)
CLK Frequency	4 MHz
Standards / Certifications	ISO-7816 (interface), PC/SC, CE, FCC
Operating System Support	Windows 98, Me, 2K and XP

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2.4.2 AET60 BioCARDKey Fingerprint Scanner and Smart Card Reader



Combining the fingerprint sensor and smart card reader, and using the same Active Capacitive Sensing technology as BioSIMKey, the BioCARDKey ensures the highest quality images to be used with full-size smart cards. It improves security and efficiency of network access, e-commerce, home banking and point-of-sales transactions.

As a proven solution for biometrics, the BioCARDKey is an ideal solution for a broad range of applications including e-business, network access, home banking, secure e-mail, file encryption, and government security.

Using a simple Application Programming Interface, it is extremely easy for designers to integrate the fingerprint authentication features into their applications. The developer can develop the interface very quickly without an

in-depth knowledge of biometrics.

Features

- High-speed USB interface
- Requiring no additional power supply
- Portable and easily transferable from one PC to another

Fingerprint Scanner

- High-resolution 508 DPI imaging
- Utilizes UPEK's patented TouchChip technology, resulting in high quality fingerprint images in any environment

Smart Card Reader

- Support smart cards that conform to ISO-7816-1/2/3 standard
- PC/SC compliant
- Supports all micro-controller cards, with T=0, T=1 protocols

Security Features Possible

- Encrypted finger print template stored inside smart card
- Session key generation among smart card, BioCardKey Processor and host computer
- Unique bonding between the smart card and BioCardkey

Typical Applications

- Remote electronic voting
- Secure e-commerce
- Secure home banking
- Computer system logon

Technical specification

Interface	USB
Supply Voltage	Regulated 5V DC (USB powered)
Active Sensor Size	12.8 mm x 18.0 mm
Array Size	256 x 360 pixels
Image Resolution	508 DPI
CLK Frequency	4 MHz
Standards / Certifications	ISO-7816-1/2/3 (interface), PC/SC, CE, FCC
Operating System Support	Windows 98, Me, 2K and XP

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2.4.3 AET63 BioTRUSTKey Fingerprint Scanner and Smart Card Reader



The AET63 BioTRUSTKey combines the highly successful silicon fingerprint sensor with a smart card reader to achieve ultra-secure authentication. It is a fully integrated fingerprint-based biometric subsystem, combining fingerprint sensing and algorithm processing in a single, compact device. All biometric algorithm processing is carried out in a custom chip integrated at the back of the silicon fingerprint sensor.

Our biometric products leverage ACS technology and experience in implementing readers in smart card based authentication programs. By partnering with leading biometric sensor and algorithm supplier, we are providing a high level of security and convenience for applications in the government, corporate, financial and healthcare sectors.

With BioTRUSTKey, you have all the hardware and software you need to add biometric security to your custom applications. For PC applications, the BioTRUSTKey provides the highest level of security. This is because both the template extraction and matching algorithms run within the device itself - not in the PC.

The BioTRUSTKey significantly reduces development time and cost. Therefore new product design can be validated quickly and accurately. With the simple Application Programming Interface (API) provided, designers can easily add fingerprint authentication and smart card features into their products/applications. A system can be developed very quickly, without an in-depth knowledge of biometrics.

Features

- USB Plug and play interface
- Require no additional power supply
- High-resolution 508 DPI imaging
- Utilizes CMOS active capacitive pixel-sensing technology, resulting in high quality fingerprint image capture
- The template extraction and matching algorithms run within the device itself - not in the PC
- Large active sensor size – 12.8 mm x 18.0 mm
- Support all micro-controller cards, with T=0, T=1 protocols
- Support one SAM card (optional)

Technical Specification

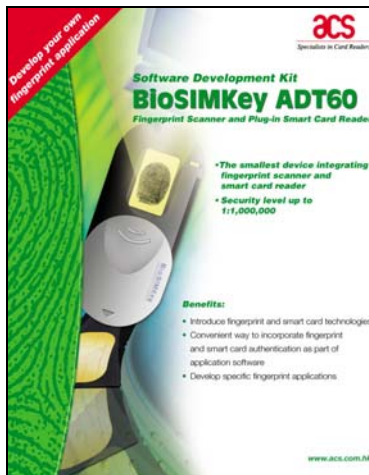
Interface	USB
Supply Voltage	Regulated 5V DC (powered by USB)
Active Sensor Size	12.8 mm x 18.0 mm
Array Size	256 x 360 pixels
Image Resolution	508 DPI
CLK Frequency	4 MHz
Standards / Certifications	ISO-7816-1/2/3 (interface), CE, FCC
Operating System Support	Windows 98, Me, 2K and XP

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2.4.4 SDK-ADT60 - ADT60 BioSIMKey Software Development Kit (SDK)



BioSIMKey is the world's smallest fingerprint scanning and recognition device incorporating smart card reading/writing capabilities. As a proven solution for biometrics with security level as high as 1:1,000,000, the BioSIMKey is ideal for a broad range of applications including e-business, network access, home banking, secure e-mail, file encryption, and government securities, etc.

ACS is launching a development kit, BioSIMKey SDK, in order to provide developers with a convenient and effective way to incorporate fingerprint and smart card authentication as part of their solutions.

Using the simple Application Programming Interface (API), designers can easily integrate fingerprint authentication features into their applications. The interface could be developed quickly without any in-depth knowledge of biometrics.

Package Contents

- BioSIMKey ADT60 - Fingerprint scanner & plug-in smart card reader
- 10 ACOS2 8Kbyte Microprocessor-based Card (MCU) (include 5 smart cards and 5 plug-in cards)
- ACS BioSIMKey installation and operation CD-ROM (including drivers, source codes, and demo software)
- Plug-in card converter (converting smart card format to plug-in card format)
- Installation guide

Features

- Smallest integrated fingerprint scanner and smart card reader
- Security level as high as 1:1,000,000
- Portable and easily transferable from one PC to another
- Enhances smart card and/or PKI security by requiring a fingerprint instead of a PIN or password
- Utilizes UPEK's patented TouchChip technology, resulting in high quality fingerprint images in any environment
- High-speed USB interface
- SDK contains all the vital components required for smart card / finger print application development
- SDK designed for both novice and experienced developers

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2.4.5 SDK-AET60 - AET60 BioCARDKey Software Development Kit (SDK)



BioCARDKey is a fingerprint scanning and recognition device incorporating smart card reading/writing capabilities. As a proven solution for biometrics with security level as high as 1:1,000,000, the BioCARDKey is ideal for a broad range of applications including e-business, network access, home banking, secure e-mail, file encryption, and government securities, etc.

This BioCARDKey software development kit provides the developers with a convenient and effective way to incorporate fingerprint and smart card authentication as part of their solutions.

Using the simple Application Programming Interface (API), designers can easily integrate fingerprint authentication features into their applications. The interface could be developed quickly without any in-depth knowledge of biometrics.

Package Contents

- AET60 BioCARDKey - Fingerprint scanner & smart card reader
- 10 ACOS2 8Kbyte Microprocessor-based Card (MCU)
- AET60 BioCARDKey installation and operation CD-ROM (including drivers, source codes, and demo software)
- Card holder (for SIM-sized smart card to place in card holder for insertion to the reader)
- Quick start guide

Features

- Integrated fingerprint scanner and smart card reader
- Security level as high as 1:1,000,000
- Portable and easily transferable from one PC to another
- Enhances smart card and/or PKI security by requiring a fingerprint instead of a PIN or password
- Utilizes UPEK's patented TouchChip technology, resulting in high quality fingerprint images in any environment
- High-speed USB interface
- SDK contains all the vital components required for smart card / finger print application development
- SDK designed for both novice and experienced developers

2.4.6 SDK-AET63 - AET63 BioTRUSTKey Software Development Kit (SDK)



BioTRUSTKey is a fingerprint scanning and recognition device incorporating smart card reading/writing capabilities. Since all biometric algorithm processing is carried out in a custom chip within the device, security level is further enhanced. The BioTRUSTKey is ideal for a broad range of applications including e-business, network access, home banking, secure e-mail, file encryption, and government securities, etc.

This BioTRUSTKey software development kit provides the developers with a convenient and effective way to incorporate fingerprint and smart card authentication as part of their solutions.

Using the simple Application Programming Interface (API), designers can easily integrate fingerprint authentication features into their applications. The interface could be developed quickly without any in-depth knowledge of biometrics.

Package Contents

- AET63 BioTRUSTKey - Fingerprint scanner & smart card reader
- 10 ACOS2 8Kbyte Microprocessor-based Card (MCU)
- AET63 BioTRUSTKey installation and operation CD-ROM (including drivers, source codes, and demo software)
- Card holder (for SIM-sized smart card to place in card holder for insertion to the reader)
- Quick start guide

Features

- Integrated fingerprint scanner and smart card reader
- Utilizes CMOS active capacitive pixel-sensing technology, resulting in quality fingerprint image capture
- The template extraction and matching algorithms run within the device itself – not in the PC
- Portable and easily transferable from one PC to another
- Enhances smart card and/or PKI security by requiring a fingerprint instead of a PIN or password
- High-speed USB interface
- SDK contains all the vital components required for smart card / finger print application development
- SDK designed for both novice and experienced developers

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2.5 Smart Card Readers with PIN-pad

2.5.1 ACR88 Handheld Portable Smart Card Reader



With the increasingly wide acceptance of smart card in the market in the recent years, smart card applications have gained maturity in terms of its level of sophistication and coverage in the market. With this, a versatile smart card reader becomes an emergent need.

ACR88 is a versatile handheld portable smart card reader, having a built-in keypad, LCD display and buzzer features. It can also host additional features like fingerprint scanner, contactless card reader or non-volatile memory to enhance the security and give better support to your system.

ACR88 is a line of secured electronic devices of pocket size designed primarily for multi-application. It is capable of performing secure authentication, displaying rich information from the card, conducting online or offline transaction.

With ACR88, and its robust development platform, Astro Builder, users can now easily build their own applications loadable to the Astro platform, complementary to the many common functional features already available in the platform. No more programming in lower level languages, or dealing with kernel development and other hardware platform dependent issues! Application developers can now use the set of well-defined easy-to-use commands provided, and have full rein of realizing the limitless possibilities which your application will bring.

Features

- Built-in 20-Key Keypad with extremely high durability
- 132 x 64 dot-matrix LCD
- Monotone buzzer with software controlled ON/OFF
- Accepts 3 V and 5V cards: two full-size cards and 3 SAM cards
- Real-time clock (RTC)
- Requires no additional power supply in PC-Linked mode
- Automatically switch to 3 x AAA battery power in standalone mode
- Low-battery detection
- Independent backup battery (1 x CR2032) for RAM and RTC
- Support up to 115kbps card communication speed
- EMV2000 v.4.0 Level 1
- CCID compatible
- On-board firmware upgradeable, on-board script loading
- Tamper switch
- Hand-held size and weight
- (Optional) Fingerprint scanner
- (Optional) Contactless card reader
- (Optional) Non-volatile memory

Technical specification

Interface	USB 1.1 Full Speed
Operating Voltage	3.3V
Backup Battery	Independent backup battery (1 x CR2032) for RAM and RTC
Card/Reader Communication Speed	Up to 115,200 bps
Operating Temperature	0 - 50° C
Language	Programmable in C Language
Keypad	20 keys
LCD Display	132 x 64 dot-matrix LCD with backlight
Buzzer	Monotone buzzer with software controlled ON/OFF

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2.5.2 ACR80 PIN-pad reader



The ACR80 is a secure PIN-pad smart card reader featuring a 4 by 20 line character dot-matrix LCD display as well as providing up to 122 x 32 pixel graphic image display. It includes a 16-key keypad with 4 function keys, 2 smart card slots, and up to 6 SAM card slots depending on customers' preferences.

The device supports T=0 or T=1 cards. It is an ideal solution for supporting dynamic upgrade of code and application, 3DES-based encryption for server and reader authentication and secure PIN management.

ACR80 is a PC based smart card interface device (IFD), small in size but packed with capabilities. The plan for next generation product would be to turn it into an even more sophisticated device number such as fingerprint biometrics.

ACR80 is ideal for application such as home-banking and e-commerce applications whereby a simple PC based smart card does not meet your security requirements – such as PIN entry and confirmation of transaction details before signing. ACR80 is also ideal for health card application.

Features

- Two ISO-7816-1/2/3 compatible smart card interfaces
- Two ISO-7816-1/2/3 compatible security application modules (SAM) card interfaces (2, 4 or 6 SAM-slots available)
- Supports MCU-based cards with T=0, T=1 protocol
- Supports SLE4432/42 and SLE4418/28 memory cards
- ANSI x 9.52
- ANSI x 9.24 DUKPT
- Secure firmware upgrade in the field
- EMV level 1
- RS-232 (serial) or USB interface
- Short circuit protection on all slots
- Simple and fully documented API (Application Programming Interface) for easy application development
- 122x32 dots LCD full graphic display with LED backlight
- Adjustable LCD contrast
- Internal display buffer allows free graphic modification with only one time drawing
- 16-key keypad with extremely high durability
- Tamper sensing switch
- Buzzer with software switching control
- Real time clock
- 32K bytes EEPROM (optional)

Technical specification

Interface	RS-232 (Serial) or USB
Supply Voltage	Regulated 5V DC
Supply Current	< 40-50mA (without backlight and smart card)
Operating Temperature	0 - 50° C
Physical Dimensions	138.0mm (L) x79.0mm (W) x24.7mm (H)
Standards / Certifications	ISO-7816-1/2/3 (interface), PC/SC, CE, FCC, EMV Level 1
Operating System Support	Windows 98, Me, NT (serial), 2K and XP

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2.5.2 SDK-ACR80 - Software Development Kit (SDK)



The ACR80 Software Development Kit (ACR80 SDK) enables effective development of customized applications and systems using smart cards, card readers, and PCs. Reflecting ACS expertise in smart card technologies, the development kit is a complete package containing all the vital components required for smart card application development, which is suitable for both beginners and experienced developers. It is also an ideal training and development tool for those who would like to know more about smart card technologies.

1 x ACR80 PIN-pad reader

- Two smart card slots and two SAM slots
- Secure firmware upgrade in the field
- ANSI x 9.52
- ANSI x 9.24 DUKPT
- Support smart cards that conform to ISO-7816-1/2/3 standard

10 x ACOS2 microprocessor-based card

- Compliance with ISO-7816, T=0 protocol
- MCU card with DES and MAC security capabilities

1 x CD-ROM

Software drivers supporting Windows 98, Me, NT (serial), 2000, and XP

Demo programs to showcase smart card features and capabilities

- "Smart Casino" demo (using the ACOS2 card as token)
- "ATM" demo (using the ACOS2 card as ATM card)
- "Taximeter" demo (using ACOS2 card as e-purse card)

CardTool evaluation software

- Used for both memory and ACOS2 cards
- Facilitates easy transfer of data to various memory locations on the card
- Provides a convenient test facility to evaluate card response to different data

Sample code written in various programming languages (Delphi, VB, and C++)

- Used to demonstrate basic commands used to communicate with the card and reader

2.6 Contactless Readers

2.6.1 ACR120 Contactless Smart Card Reader/Writer



The ACR120 is a compact and cost-effective contactless reader and writer. It is developed on the 13.56MHz contactless smart card (RFID) technology, supporting Mifare® (Classics, DESFire), ISO 14443 A and B cards. Its proximity operating distance is up to 5 cm, depending on the type of contactless tag in use.

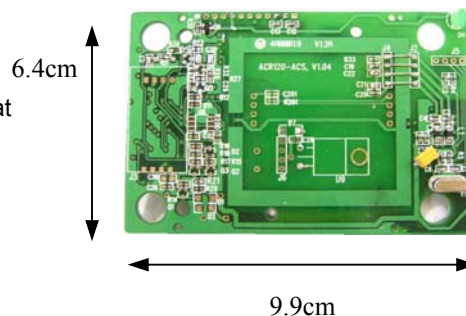
The versatile reader is available in both USB and Serial interface version, which can be easily integrated into PC environment as well as other systems in a snap. It is ideal for a board range of applications, including public transport terminals, physical and logical access controls, and even vending machines

The operation of ACR120 is extremely easy, quick and convenient. All read/write operations can be done via waving the contactless card to the device. Moreover, its compact design enables it to be mounted and located in anywhere with ease.

In addition, ACR120 also available in a module form, which is extremely easy to design-in giving you maximum design and development flexibility. Own casing, logo, color, size can all now be materialized.

Features

- USB PnP or serial interface (RS232)
- Read and write functionality
- Built-in Antenna
- Fully tested and compliant with major contactless smart cards that conform to ISO14443 A/B in the market.
- Operation LED
- High-speed transactions
- Compact size: 120 X 73 X 20mm
- Wall mountable
- Built-in contact/contactless smart card slots (on request)
- SAM slot (on request)



Technical specification

Interface	RS-232 (Serial) or USB
Supply Voltage	Regulated 5V DC
Operating Distance	>= 50 mm
Supply Current	100 mA
Operating Temperature	0 - 50° C
Physical Dimensions	120 mm (L) x 73 mm (W) x 20 mm (H)
Operating Frequency	13.56 MHz
Standards / Certifications	CE, FCC
Operating System Support	Windows 98, ME, 2K, XP

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2.6.2 SDK-ACR120 - ACR120 Contactless Smart Card Development Kit



The ACR120 Software Development Kit (SDK) enables effective development of customized applications and systems using Mifare® cards, contactless readers, and PCs.

Reflecting ACS expertise in smart card technologies, the ACR120 SDK is a complete package containing all the vital components required for contactless smart card application development.

It is also an ideal training and development tool for those who want to know more about contactless smart card technologies.

Software development companies can use the kit to develop systems specific to their requirements to meet customers' demanding needs or to incorporate various contactless smart card technologies into their current applications.

Package Contents

- 1 x ACR120 Contactless Smart Card Reader (Serial or USB version)
- 1 x ACR38DT DualKey (A key for both physical and logical access control)
- 5 x 1K MIFARE® Contactless Cards
- 1 x Combi Card
- 1 x Installation and Operation CD-ROM (Includes drivers, sample codes, demo applications, utility tools etc.)

Features

- Read and write ISO14443 cards and MIFARE® cards
- High-speed transactions
- Flexible configurations
- RS232 or USB interface to PC with simple command structure
- SDK contains all the vital components required for contactless application development
- SDK designed for both novice and experienced developers

Technical specification

Interface	RS-232 (Serial) or USB
Supply Voltage	Regulated 5V DC
Operating Distance	>= 50 mm
Supply Current	100 mA
Operating Temperature	0 - 50° C
Physical Dimensions	120 mm (L) x 73 mm (W) x 20 mm (H)
Operating Frequency	13.56 MHz
Standards / Certifications	CE, FCC
Operating System Support	Windows 98, ME, 2K, XP

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2.7 Physical Access Control

2.7.1 ACM133 - Fingerprint Controller Module



The ACM133 fingerprint controller module is a stand-alone, battery-operated lock-controller for physical access control applications. It employs the most advanced fingerprint scanning and recognition technology that can accurately authenticate a user's identity.

The module is specially designed to minimize power consumption and hence extend the battery life.

ACS pays special attention in designing man-machine interfaces that are both intuitive to operate and easy to manufacture. We can work with our partners to customize our design to suit their needs.

System Features

- High-resolution 508 DPI imaging
- Utilizes CMOS active capacitive pixel-sensing technology, resulting in good quality of fingerprint image capture
- Large active sensor size – 12.8 mm x 18.0mm
- Stand-alone, battery-powered operation.
- Low power consumption – can be up to 7000 operations for 4 AA size alkaline batteries.
- Battery-low warning
- Emergency power supplier input – 9V or 12V.
- Intuitive and user-friendly man-machine interaction design with visual and audio cue to prompt and alert users.
- 5V control signal capable of driving a motor or a solenoid for lock-control.
- Audio prompt
- Visual prompt
- Sensor Input and data entry

Security Features

- Capable of implementing multi-level security with Master and General user differentiation.
- Optional keypad entry to implement multi-factor authentication in a high security environment.

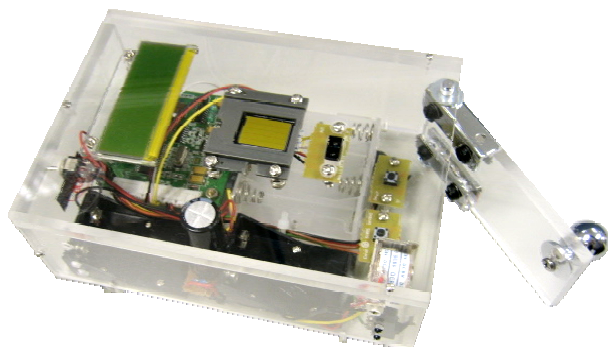
General	
Power supply	Battery Power – 4 AA size battery minimum
Emergency Power Supply	9V or 12V D.C.
Active sensor size	12.8 x 18 mm
Array size	256 x 360 pixels
Image resolution	508 DPI
Number of fingerprint template	12 guaranteed; 20 typical
False Acceptance Rate (FAR)	< 0.001 %
False Rejection Rate (FRR)	< 0.6 %
ESD tolerant	+/- 15kV
Control Signal	
Tamper-proof Protection	Protects against unauthorized opening of casing
Physical Dimensions	183.0mm (L) x 88.0mm(W) x 37.0mm (H)
Weight	Approx. 450g (with battery pack installed)
Wireless connectivity (GSM/GPRS)	
Drive Current	Up to 1 A maximum
Drive Voltage	Direct from 6V battery
Operating Conditions	
Temperature	-20° C - 50° C
Humidity	5% - 85%

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2.7.2 EVK - ACM133 Evaluation Kit



The EVK-ACM133 evaluation kit, an extension of the ACM133 fingerprint controller module, is a standalone and ready-to-use evaluation kit showcasing the application of physical access control, with the "fingerprint is your key" concept. Without worries of forgetting password or losing keys, users can enjoy the merits of the fingerprint controller and safely protect their assets.

Package Contents

- ACM133 fingerprint controller module
- LCD (65.4mm X 29.1mm, 122 X 16 dot matrix)
- Infrared proximity sensor, for on-application auto-switching
- Built-in buzzer, to provide audible feedback and alert
- Door sensors, to detect door status (open/close)
- Press buttons, for enrolling and deleting fingerprint templates

The evaluation kit is the typical application to show you how ACM133 can be applied to create access control for door locks, safes and vaults, time and attendance control devices, etc. Depending on your application, ACS can provide you with the following options to choose from.

Power Switch	Display
Infrared proximity sensor	LCD (65.4mm X 29.1mm, 122 X 16 dot matrix)
Capacitance proximity sensor	7-segment digits
On/off switch	LEDs

2.8 GSM Management Tools

2.8.1 SIMmate



With SIMmate, you can easily create, edit, and backup phonebook entries and short messages using your PC. You can manage your PIN codes and transfer data from one SIM to another on your desktop or portable computer. This eliminates the hassle of keying in information through the phone's keypad, and at the same time, provides the user with a convenient way to backup phone book and short message information. These data can also be imported into other database/spreadsheet programs, as well as single-click global phone number correction/ internationalization.

You can also use the SIMmate to manage your PIN and PUK codes, obtain SIM information, change dialing modes, etc. This application tool is currently available in English, Simplified and Traditional Chinese, German and Italian.

Package Contents

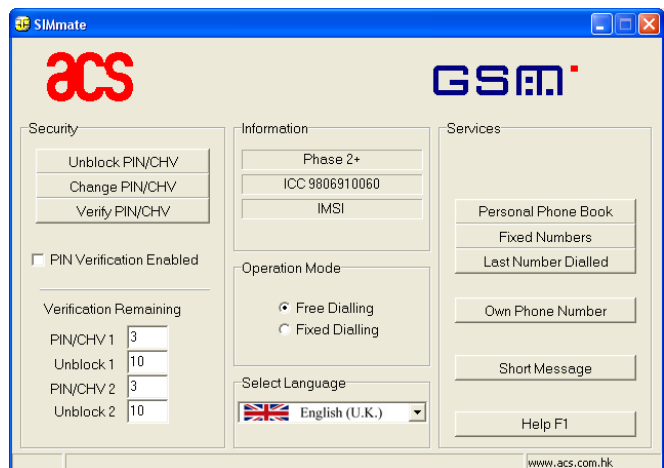
- ACR38T / ACR30T
- SIMmate CD-ROM

Features

- Edit, read, copy, save, and print phonebooks
- Edit, read, copy, save, and print SMS messages
- Access built-in common short messages (canned messages)
- Manage SIM card PIN codes
- Append global phone numbers
- Supporting languages:
 - Traditional Chinese (Chinese Big 5)
 - Simplified Chinese (Chinese GB)
 - English
 - German
 - Italian

Supported Card Type

- GSM SIM Cards
- SIMmate is compatible with card conforming to GSM 11.11 Phase 2+ standard.



System Requirements

- IBM-Compatible Personal Computer with Intel 486 Processor or higher
- Microsoft Windows 98/Me/2000/XP
- Minimum 8MB RAM
- Minimum 5MB free hard disk space
- CD-ROM drive
- Available RS-232 or USB port to match the Reader/Writer's interfaces



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2.8.2 SIMC01 - SIMcopier



ACR SIMcopier is a special smart card reader customized for GSM operators. Many GSM operators face high *churn rates*, i.e., subscribers switch telephone operators to enjoy a cheaper handset discount or lower subscription fee. Information inside user's old SIM card (e.g., phone-book and SMS files) is usually lost during the process of switching. Users have to re-enter the data again if they are still available.

ACR SIMcopier is a low cost standalone device that does the job of copying the phonebook and SMS files directly from a SIM card to another *without PC connection*. Because of its low cost, the GSM operator is able to equip every sales outlet with such a device to serve the mobile phone users efficiently.

Features

- ISO-7816-1/2/3, CE, FCC
- EMV level 1 certified
- Does not require PC connection
- Low cost standalone device that does the job of copying the phone-book and SMS which was previously done via a PC
- Standalone device
- Three LEDs card status indicators
- There are three LEDs indicators – one for device power indication and the other two for the full size smart card status indications. The two card status LEDs have dual color that differentiate whether the smart card has been powered and also if the smart card is presently communicating with the reader
- Graphic LCD with backlighting
- There is a 122x32 graphics LCD display with backlighting, which can be used to display graphics or up to 4 x 20 alphanumeric characters.
- Real-time clock
- Buzzer
- 16-key keypad
- Supports GSM 11.11 SIM card, which is the Global System for Mobile Communications (GSM) version 11.11 specification
- Copy all phone book records, SMS messages and language preference from source card to destination card
- Short Message Service (SMS) is defined by the GSM 11.11 specification
- Phone book record - Abbreviated Dialling Number (AND) is defined by the GSM 11.11 specification
- Supports International language -- English [other languages are available upon request]
- Password protection
- SIM space detection
- Warning message is shown when the space of destination card is not enough
- Able to delete all phone book records and SMS messages and display the total numbers of free phone book records and SMS messages.
- The package includes a SIM card holder (Convert the SIM card format to smart card format)

Technical specification

Supply Voltage	Regulated 5V DC
Supply Current	< 100mA (without smart card)
Physical Dimensions	211mm (L) x 100mm (W) x 59mm (H)
CLK Frequency	3.68 / 4 MHz
Standards / Certifications	ISO-7816-1/2/3 (interface), PC/SC, CE, FCC, and EMV

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2.9 PC-linked Readers with Flash Storage

2.9.1 ACR100 SIMFlash



More than just a smart card reader, the ACR100 also has a built-in 256MB flash memory. Designed to access SIM-sized smart cards (Plug-in cards) and for data or application storage. It is ideal for GSM solutions such as GSM management software and VoIP applications, electronic payment systems, home banking, computer/network access and transportation.

i) Serves as a Plug-in (SIM-sized) Card Reader:

ACR100 is a reliable and cost-effective smart card reader for security related applications. A USB full speed Plug-in (SIM-sized) card reader that enables you to back-up and manage the information on your SIM card to your PC. It supports MCU cards with T=0 and T=1 protocols and GSM cards conforming to Spec 11.11.

ii) Serves as a Mass Storage Device:

Furthermore, it is a Mass Storage device at the same time. Highly **portable** – with a dimension of 78.73 mm x 21.50 mm x 11.00 mm makes it a perfect companion wherever you go. **Bus powered** – no need for additional cable and power supply. And a **Mass Storage Device Class compatible** – no need for additional drivers.

Features

- USB full speed interface
- No need for separate power supply or battery – *Bus powered*
- No need to run separate drivers on most Windows version – *CCID and Mass Storage Device Class compatible*
- Automatic driver installation functionality
- USB Composite Device – works as Mass Storage and Smart Card Reader
- With protective USB cap, SIM card slot cover and Keychain loop
- Compliant with the following International Standards: *ISO7816 Class A and AB (5V, 3-5V), CE, FCC, PC/SC, and Microsoft WHQL*
- Smart Card Reader:
 - Read and write all microprocessor cards with T=0, T=1 protocols
 - Support 5V MCU cards
 - Support GSM card with Spec 11.11
 - Support Plug-in (SIM-sized) card
 - Short Circuit Protection
- Flash Drive:
 - Mass Storage Device Class compatible - no driver needed in Windows 2000 and XP
 - Built-in 256MB flash memory (higher memory size is available upon request)
 - Public (*free read/write area for data storage*) and Private (*protected area for pre-loaded applications*) zones

Technical specification

Interface	USB full speed
Supply Voltage	Regulated 5V DC
Supply Current	< 100mA (without smart card)
Operating Temperature	0 - 50° C
CLK Frequency	4 MHz
Standard/Specifications	ISO7816 Class A and AB (5V, 3-5V) cards, PC/SC, CE, FCC, Microsoft WHQL
Operating System Support	Windows 2000, XP

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3. ACS services

3.1 Product Customization

ACS offers product customization as well as new product development services to meet specific customers requirements. With our experienced engineering team, we have the capability to design and develop the new products that will make you stand out against competitors. We are dedicated to work with you to provide solutions to suit your needs and applications.



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3.2 Consultancy and Training



ACS offers consultancy and training services. Every once in a while, we may invite our customers to participate in a training session conducted in our offices. Likewise, we are willing to conduct specialized training for interested parties.

Please email us at info@acs.com.hk

3 Days smart card technology, application & system design and implementation training

Objective

This training targets solution and integration houses with people who have strong IT capabilities but have not been in the smart card solution business and have not been formally trained.

Trainee profile

This training is ideal for system design engineers and software and hardware engineers who will be involved in the smart card solution implementation. It is also suitable for project managers who need to manage a smart card based project. Senior management and sales personnel may sit through the training to have an idea on what could be involved in a smart card business before jumping into it. It is also useful for sales and marketing people dealing with products and systems related to the smart card industry. For system design, smart card project manager, engineers and programmers, day 1 of the training serves as a foundation and overview, and days 2 and 3 of the training strengthens their capabilities of doing their job in smart card technology.

Instructor profile

Tan Keng Boon has been in the smart card industry for 10 years - 5 years in Gemplus Technologies Asia as Technical Manager, 2 years as a smart card application consultant, 2 years in De La Rue Card Systems (the predecessor of Oberthur Card Systems), and then in ACS. Over the past 10 years he has trained thousands of professionals in Asia Pacific, and has been a consultant to a number of card manufacturers, payphone manufacturers, ATM manufacturers and solution houses. He was involved in a number of banking smart card projects in Singapore, Indonesia, China, Thailand and Taiwan.

Training content

- Smart Card Technical Introduction
- Applying Cryptography In Smart Card Applications
- Memory Card Overview
- MCU Smart Card Chip Operating System (COS)
- Application Standard MCU Smart Cards Overview
- Smart Card Platforms
- PC/SC Smart Card Reader
- Disposable Electronic Purse - EuroChip / SLE-4436 and T2G
- Case Study: Disposable Electronic Purse / Electronic Gift Voucher Application System
- Secured Memory Card - SLE4442
- Secured Memory Card - SLE4428
- Case Study - Loyalty Application Using SLE 4442 / 4428
- Case Study - Organization ID Card
- Electronic Purse Application System Design
- EMV Smart Debit / Credit Smart Card
- Key Management System
- PC/SC Smart Card Reader
- GSM SIM ToolKit For Value-Added Services / Mobile Commerce

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