

Advanced Card Systems Ltd.



**ACR38 USB Smart Card Reader/Writer**



**TECHNICAL SPECIFICATIONS**

**Version 3.1 11-2006**

## ACR38 USB Smart Card Reader/Writer

### 1.0 Introduction



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.

### 1.2 About RoHS Compliance

The RoHS (**R**estriction **o**f **H**azardous **S**ubstance) Directive restricts the use of six hazardous materials in the manufacturing of various types of EEE (Electrical and Electronic Equipment), including:

- Lead,
- Mercury,
- Cadmium,
- Hexavalent chromium,
- Polybrominated biphenyl (PBB) and
- Polybrominated diphenyl ether (PBDE).



So RoHS compliance means the protection to the environment and your future generations from these restricted irritants, carcinogens and toxins.

### 2.0 Features

- **USB full speed** interface to PC with simple command structure
- Read and write all microprocessor 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**)
- Short Circuit Protection
- RoHS Compliant
- Conform with: EN 60950/IEC 60950, ISO-7816, PC/SC, CE, FCC, Microsoft WHQL, EMV 2000 Level 1
- Support ISO-7816 Class A, B and C (**5V, 3V, 1.8V**) cards
- Extra SAM slot is optional
- Support PPS (Protocol and Parameters Selection) with 1,743 – 250,000 bps in reading and writing smart cards

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## 3.0 Supported Card Types

### 3.1 MCU Cards

The ACR38 can operate MCU card with T=0 and T=1 protocol. The table presented in Appendix A (Reference Manual) explains which card type selection value must be specified for the various card types supported by the reader.

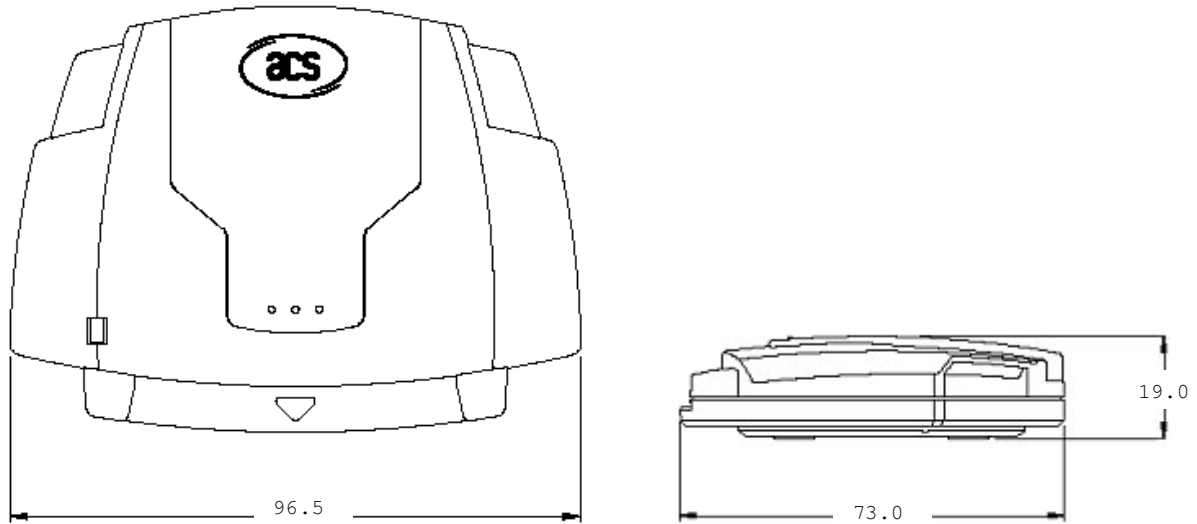
### 3.2 Memory-based smart cards (synchronous interface)

- Cards following the I2C bus protocol (free memory cards) such as:  
*Atmel:* AT24C01 / 02 / 04 / 08 / 16 / 32 / 64 / 128 / 256 / 512 / 1024  
*SGS-Thomson:* ST14C02C, ST14C04C  
*Gemplus:* GFM1K, GFM2K, GFM4K, GFM8K
- SLE4432/4442 intelligent 256 bytes EEPROM with write protect function:  
SLE4432, SLE4442
- SLE4418/4428 intelligent 1K bytes EEPROM with write-protect function:  
SLE4418, SLE4428
- Secure memory cards such as:  
AT88SC153, AT88SC1608
- SLE4406/4436/5536 '104' type EEPROM non-reloadable token counter cards:  
SLE4406, SLE4436, SLE5536

## 4.0 Typical Applications

- Home Banking and Home Shopping
- Electronic Commerce
- Checking the balance of account of re-loading an electronic purses
- Network access control
- S/W locking
- Digital signature
- Loyalty and promotions
- Stored value
- Identification
- Ticketing
- Parking and toll collection
- Online gaming

## 5.0 Technical Specification



### Universal Serial Bus Interface

Type ..... USB full speed, four lines: +5V, GND, D+ and D-  
 Power source ..... From USB  
 Speed ..... 12 Mbps

### Smart Card Interface

Standard ..... ISO-7816 Class A, B and C (5V, 3V, 1.8V), T=0 and T=1  
 Supply current ..... max. 50mA  
 Smart card read / write speed ..... 1,743 – 250,000 bps  
 Short circuit protection ..... +5V / GND on all pins  
 The presence of the smart card power supply voltage is indicated through a green LED on the reader  
 CLK frequency ..... 4 MHz  
 Card connector ..... Contact  
 Card insertion cycles ..... min. 100,000

### (Optional) SAM Card Interface

Card connector ..... Sliding  
 Location ..... Under the removable dark lid

### Physical Specifications

Dimensions ..... 73.0mm (L) x 96.5mm (W) x 19.0mm (H)  
 Color ..... Silver  
 Weight ..... 95g (± 5g allowance for cable) - Spaceship casing  
 Cable length, cord, connector ..... 1.5 meters, Fixed (non-detachable), USB A

### Operating Conditions

Temperature ..... 0 - 50° C  
 Humidity ..... 40% - 80%

### Standard/Certifications

EN 60950/IEC 60950, RoHS Compliant, EMV 2000 Level 1, ISO-7816, PC/SC, CE, FCC, USB Full Speed, Microsoft WHQL 2K, XP

### OS

Windows 98, ME, 2K, XP, NT 4.0, 2K3 Server, Linux, MAC OS X

### OEM

OEM-Logo possible, customer-specific colors, casing and card connector



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## 6.0 Software Development Kit Specifications

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.

### Package Contents

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

### The SDK CD-ROM includes:

- Sample Applications – Casino Application, School Application, and ACOS Screen Saver (For Windows 2000 and XP only). These demo programs can showcase the wide range of applications ACR38 can be employed in, e.g. e-purse, physical and logical access control, etc.
- Sample Codes – C#, Delphi, VB.NET, Visual Basic, Visual C++
- Tools & Utilities – Card Tool, PC/SC Learning Tool, Quick View and Scripting Tool
- User Manuals and Reference Materials – ACOS2 Reference Manual, ACOS3 Reference Manual, ACR38 Memory Card Access, ACR38 OCF, ACR38 Reference Manual, ACR38 Technical Specifications, ACR38T Technical Specifications, Balance Reader Technical Specifications, FAQ, PC/SC Specifications, Training Materials and Product and Service Guide
- SDK User Manual

