# Advanced Card Systems Ltd.
## Card & Reader Technologies

# ACR38U-A4
# Smart Card Reader

Technical Specifications V2.03

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# 1.0. Introduction

Smart Card Reader Technology offers to address the rising demand of e-working methods (remote office, home office, etc.) and the increasing risk of unauthorized access to private networks. With smart card-based solutions, you can now properly secure access to personal computers, and intranet and extranet networks.

ACR38U-A4 is the ideal solution for your application using Smart Card Contact Technology. As smart cards become an essential component in network security and electronic payment system, the ACR38U-A4 provides an added layer of security since the card authentication is done via SAM Interface.

ACR38U-A4 is a smart card reader/writer which offers you the option to improve the security of your system with its SAM (Secure Access Module) support. It is a USB Full Speed device, which is the interface for the communication between a computer and a smart card. It is designed for a computer-based environment and is the ultimate smart card peripheral for your application.

## 1.1. Working Principle of SAM

The SAM or Secure Access Module slot is an additional feature in a smart card reader that can enhance the level of security in your smart card application. Normally, card authentication is done via application, however, with the presence of a SAM card inserted in the SAM interface/slot; mutual authentication can be implemented between the card and reader/terminal. This means authentication is done via card to reader and reader to card making your system more secured and less prone to hacking. Advanced Card Systems Ltd. also provides powerful and efficient MCU (Micro Controller Unit) cards like the ACOS3 and ACOS6-SAM cards that you can use to develop your applications.

## 2.0. Features

- USB 2.0 Full Speed Interface
- Smart Card Reader:
  - Contact Card Interface
    - Supports ISO 7816 Class A, B and C (5 V, 3 V, 1.8 V) cards
    - Supports microprocessor cards with T=0 or T=1 protocol
    - Supports memory cards
    - Supports PPS (Protocol and Parameters Selection)
    - Features Short Circuit Protection
  - SAM Interface
    - One SAM slot
    - Supports ISO 7816 MCU Card (Class A)
- Application Programming Interface:
  - Supports PC/SC
  - Supports CT-API (through wrapper on top of PC/SC)
- Supports Android™ 3.1 and above[1]
- Compliant with the following standards:
  - EN60950/IEC 60950
  - ISO 7816
  - CE
  - FCC
  - VCCI
  - PC/SC
  - EMV 2000 Level 1
  - Microsoft® WHQL
  - RoHS 2
  - REACH

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[1] *PC/SC and CCID support are not applicable*

# 3.0. Supported Card Types

## 3.1. MCU Cards

ACR38U-A4 operates with any MCU card following either the T=0 or T=1 protocol.

## 3.2. Memory-based Smart Cards

ACR38U-A4 works with several memory-based smart cards such as:

- Cards following the I2C bus protocol (free memory cards) with maximum 128 bytes page with capability, including:
  - o Atmel®: AT24C01/02/04/08/16/32/64/128/256/512/1024

- Cards with secure memory IC with password and authentication, including:
  - o Atmel®: AT88SC153 and AT88SC1608

- Cards with intelligent 1 KB EEPROM with write-protect function, including:
  - o Infineon®: SLE4418, SLE4428, SLE5518 and SLE5528

- Cards with intelligent 256-byte EEPROM with write-protect function, including:
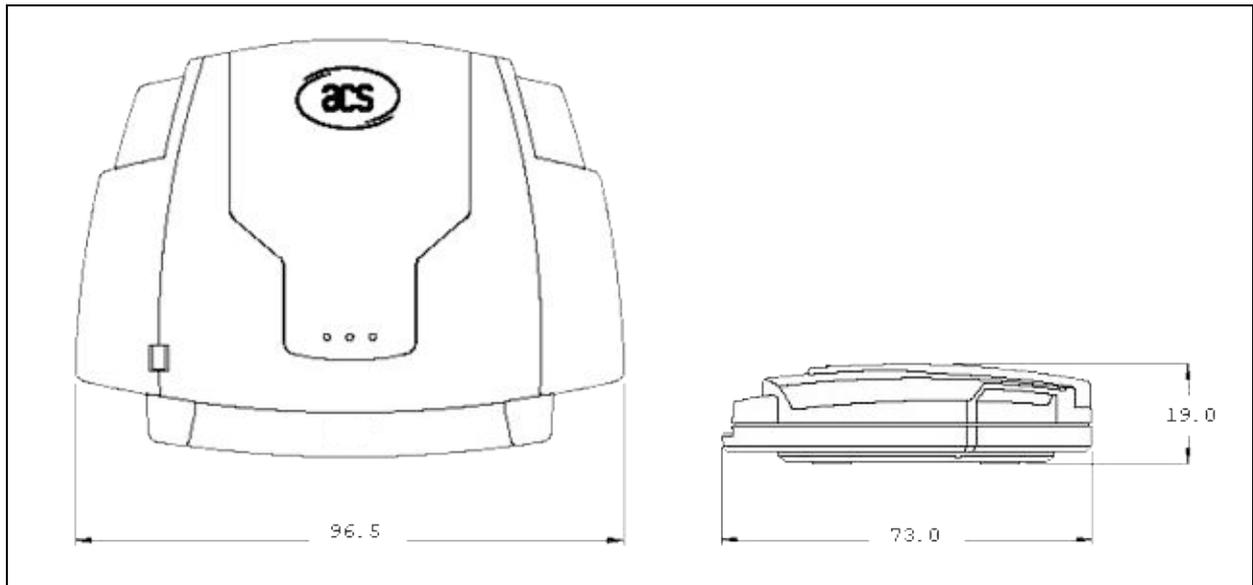  - o Infineon®: SLE4432, SLE4442, SLE5532 and SLE5542

## 4.0. Typical Applications

- e-Government
- e-Banking and e-Payment
- e-Healthcare
- Public Key Infrastructure
- Network Security
- Access Control
- Loyalty Program

# 5.0. Technical Specifications



**Universal Serial Bus Interface**

Type ............................................ USB Full Speed, four lines: +5 V, GND, D+ and D-
Power Source................................. From USB
Speed............................................ 12 Mbps

**Smart Card Interface**

Standard ...................................... ISO 7816 Class A, B and C (5 V, 3 V, 1.8 V), T=0 and T=1
Supply Current .............................. Max. 50 mA
Smart Card Read/Write Speed....... Max. 250,000 bps
Short Circuit Protection ................. +5 V/GND on all pins
CLK Frequency ............................. 4 MHz
Card Connector............................. Contact
Card Insertion Cycles.................... Min. 100,000

**Physical Specifications**

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

**Built-in Peripherals**

LED............................................... 1 LED, Green
SAM Slot ...................................... 1

**Operating Conditions**

Temperature.................................. 0 °C – 50 °C
Humidity ....................................... Max. 90% (non-condensing)
MTBF ............................................ 500,000 hrs

**Application Programming Interface**

PC/SC
CT-API (through wrapper on top of PC/SC)

**Certifications/Compliance**

EN60950/IEC 60950, ISO 7816, CE, FCC, VCCI, PC/SC, EMV 2000 Level 1, RoHS 2, REACH, USB Full Speed
Microsoft® WHQL for Windows® 2000, Windows® XP, Windows Vista®, Windows® 7, Windows® 8,
Windows® 8.1, Windows® Server 2003, Windows® Server 2008, Windows® Server 2008 R2,
Windows® Server 2012, Windows® Server 2012 R2

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## Device Driver Operating System Support

Windows® 98, Windows® ME, Windows® 2000, Windows® XP, Windows Vista®, Windows® 7, Windows® 8, Windows® 8.1, Windows® Server 2003, Windows® Server 2008, Windows® Server 2008 R2, Windows® Server 2012, Windows® Server 2012 R2
Linux®, Mac OS® and Android™ 3.1 and above

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