Advanced Card Systems Ltd.
Card & Reader Technologies

ACR3901U-S1
ACS Secure Bluetooth® Contact Card Reader

Technical Specifications V1.11

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1.0. Introduction

The ACR3901U-S1 ACS Secure Bluetooth® Contact Card Reader combines the latest technology in the world of smart card readers with Bluetooth® connectivity. This compact and wireless smart card reader brings together sophisticated technology with fresh design to meet different requirements in various smart card based applications using Bluetooth-enabled devices such as smart phones and tablets.

1.1. Smart Card Reader

The ACR3901U-S1 supports ISO 7816 Class A, B, and C smart cards (5 V, 3 V, and 1.8 V) and most memory cards in the market including microprocessor cards with T=0 and T=1 protocol. The ACR3901U-S1 has both USB Full Speed and Bluetooth 4.0 interface for smart card with read/write speed of up to 600 Kbps.

1.2. Compact Design

With a compact design and a rechargeable Lithium-ion battery for power, the ACR3901U-S1 is extremely portable and convenient for use anytime, anywhere with most Bluetooth-enabled devices in the market.

1.3. Firmware Upgradeable Feature

The ACR3901U-S1 offers in-field firmware upgrade that lets the user cope with the fast changing technology used by different applications on various scenarios. With this feature, the stakeholders can save valuable cost and time, and provide utmost convenience to its users.

1.4. Secure Bluetooth Connectivity

Along with AES-128 encryption algorithm, the ACR3901U-S1 uses Bluetooth technology that provides easy and secured integration without employing any physical connection to any terminal running Android™ 4.3 and later, iOS 5.0 and later, Windows®, and Mac OS®.

1.5. Ease of Integration

The ACR3901U-S1 is PC/SC and CCID-compliant making it easy to install and use with any computer-based environment. Its drivers are compatible with operating systems such as Windows®, Linux® and Mac OS®.

With its numerous features, the ACR3901U-S1 is the perfect smart card reader for your smart card solution.

2.0. Features

- USB 2.0 Full Speed Interface
- Bluetooth Interface
- Plug and Play – CCID support brings utmost mobility
- Smart Card Reader:
  - Contact Interface:
    - Supports ISO 7816 Class A, B, 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
    - Supports AES-128 encryption algorithm
- Application Programming Interface:
  - Supports PC/SC
  - Supports CT-API (through wrapper on top of PC/SC)
- Built-in Peripherals:
  - LEDs
- USB Firmware Upgradeability[1]
- Supports Android™ 4.3 and later[2]
- Supports iOS 8.0 and later[3]
- Compliant with the following standards:
  - EN 60950/IEC 60950
  - ISO 7816
  - Bluetooth®
  - EMV™ Level 1 (Contact)
  - PC/SC
  - CCID
  - CE
  - FCC
  - RoHS
  - REACH
  - VCCI (Japan)
  - MIC (Japan)
  - Microsoft® WHQL

[1] *Applicable under PC-linked mode*
[2] *Uses an ACS-defined Android Library*
[3] *Uses an ACS-defined iOS Library*

3.0. Supported Card Types

3.1. MCU Cards

The ACR3901U-S1 operates with MCU cards following either T=0 or T=1 protocol.

3.2. Memory-based Smart Cards

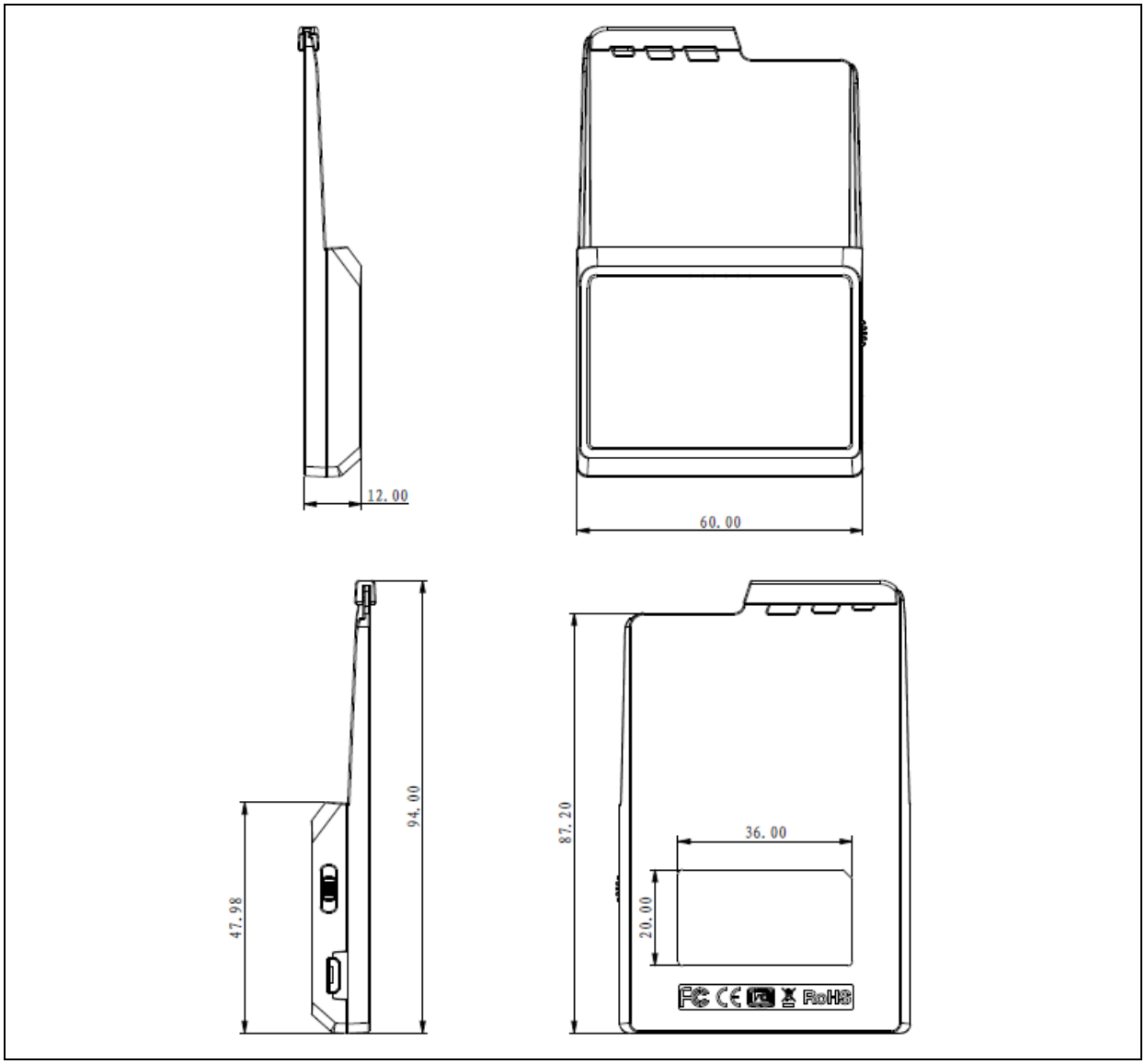
The ACR3901U-S1 works with several memory-based smart cards such as:

- Cards following the I2C bus protocol (free memory cards) with maximum 128 bytes page with capability, including:
  - Atmel®: AT24C01/02/04/08/16/32/64/128/256/512/1024
  - SGS-Thomson: ST14C02C, ST14C04C
  - Gemplus: GFM1K, GFM2K, GFM4K, GFM8K
- Cards with secure memory IC with password and authentication, including:
  - Atmel®: AT88SC153 and AT88SC1608
- Cards with intelligent 1 KB EEPROM with write-protect function, including:
  - Infineon®: SLE4418, SLE4428, SLE5518 and SLE5528
- Cards with intelligent 256-byte EEPROM with write-protect function, including:
  - Infineon®: SLE4432, SLE4442, SLE5532 and SLE5542
- Cards with '104' type EEPROM non-reloadable token counter cards, including:
  - Infineon®: SLE4406, SLE4436, SLE5536 and SLE6636
- Cards with intelligent 416-bit EEPROM with internal PIN check, including:
  - Infineon®: SLE4404
- Cards with Security Logic with Application Zone(s), including:
  - Atmel®: AT88SC101, AT88SC102 and AT88SC1003

4.0. Typical Applications

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

5.0. Technical Specifications



Physical Characteristics	
Dimensions	94 mm (L) × 60 mm (W) × 12 mm (H)
Weight	30.8 g (59.7 g with cable ± 5 g tolerance)
Colors	Gray, White
Bluetooth Interface	
Protocol	Bluetooth (Bluetooth Low Energy/Bluetooth 4.0)
Power Source	Rechargeable Lithium-ion Battery (charging through USB)
Speed	1 Mbps
USB Host Interface	
Protocol	USB CCID
Connector Type	Micro-USB
Power Source	From USB port
Speed	USB Full Speed (12 Mbps)
Supply Voltage	5 V
Cable Length	1 m, Detachable

Contact Smart Card Interface

Number of Slot ..... 1 Full-sized Card Slot
Standard ..... ISO 7816 Parts 1-4, Class A, B, C (5 V, 3 V, 1.8 V)
Protocol ..... T=0; T=1; Memory Card Support
Supply Current ..... Max. 50 mA
Smart Card Read/Write Speed..... 9.6 Kbps – 600 Kbps
Short Circuit Protection ..... (+5) V/GND on all pins
Clock Frequency ..... 4.80 MHz
Card Connector Type..... ICC Slot 0: Contact
Card Insertion Cycles..... Min. 100,000

Built-in Peripheral

LED ..... 3 single-color: Red, Blue, and Green

Other Features

Encryption ..... In-device AES-128 Encryption Algorithm
Firmware Upgrade ..... Supported (upgradeable through USB interface)

Application Programming Interface

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

Operating Conditions

Temperature ..... 0 °C – 60 °C[4]
Humidity ..... Max. 85% (non-condensing)
MTBF ..... 400,000 hrs

Certifications/Compliance

EN 60950/IEC 60950, ISO 7816, USB Full Speed, Bluetooth, EMV™ Level 1 (Contact), PC/SC, CCID, CE, FCC, RoHS, REACH, VCCI (Japan), MIC (Japan), Microsoft® WHQL

Device Driver Operating System Support

Windows® 7, Windows® 8, Windows® 8.1, Windows® 10
Windows® Server 2003, Windows® Server 2008, Windows® Server 2008 R2, Windows® Server 2012, Windows® Server 2012 R2, Windows® Server 2016
Linux®, Mac OS®, Android™[5], iOS[6]

[4] *Recommended Charging Temperature: 0 ℃ – 45 ℃*
[5] *4.3 and later Android versions is required for Bluetooth 4.0*
[6] *8.0 and later iOS versions is required*