



Advanced Card Systems Ltd.
Card & Reader Technologies

ACR3901U-S1 Bluetooth[®] Contact Card Reader

Technical Specifications V1.04





Table of Contents

1.0.	Introduction	3
1.1.	Smart Card Reader.....	3
1.2.	Compact Design	3
1.3.	Firmware Upgradeable Feature.....	3
1.4.	Secure Bluetooth Connectivity.....	3
1.5.	Ease of Integration.....	3
2.0.	Features	4
3.0.	Supported Card Types	5
3.1.	MCU Cards	5
3.2.	Memory-based Smart Cards.....	5
4.0.	Typical Applications.....	6
5.0.	Technical Specifications.....	7



1.0. Introduction

ACR3901U-S1 Bluetooth® Contact Card Reader combines the latest technology in the world of smart card readers with Bluetooth® Smart 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

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. ACR3901U-S1 have 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, ACR3901U-S1 is extremely portable and convenient for use anytime, anywhere with most Bluetooth-enabled devices in the market.

1.3. Firmware Upgradeable Feature

ACR3901U-S1 offers in-field firmware upgrade to allow the user to cope up with the fast changing technology that is being utilized by different applications on various scenarios. With this feature, the stakeholders will be able to save valuable cost and time and provide utmost convenience to its users.

1.4. Secure Bluetooth Connectivity

Along with AES-128 encryption algorithm, ACR3901U-S1 uses Bluetooth Smart technology that allows easy and secure 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

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 Smart Interface
- Plug and Play – CCID support brings utmost mobility
- USB Firmware Upgradeability¹
- Smart Card Reader:
 - 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
 - Supports AES-128 encryption algorithm
- Application Programming Interface:
 - Supports PC/SC
 - Supports CT-API (through wrapper on top of PC/SC)
- Supports Android™ 4.3 and later²
- Supports iOS 5.0 and later²
- Built-in Peripherals:
 - LEDs
- Compliant with the following standards:
 - EN60950/IEC 60950
 - ISO 7816
 - Bluetooth® Smart
 - EMV™ Level 1 (Contact)
 - PC/SC
 - CCID
 - CE
 - FCC
 - RoHS 2
 - REACH
 - VCCI (Japan)
 - MIC (Japan)
 - Microsoft® WHQL

¹ Applicable under PC-linked mode

² Uses an ACS-defined Android Library



3.0. Supported Card Types

3.1. MCU Cards

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

3.2. Memory-based Smart Cards

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

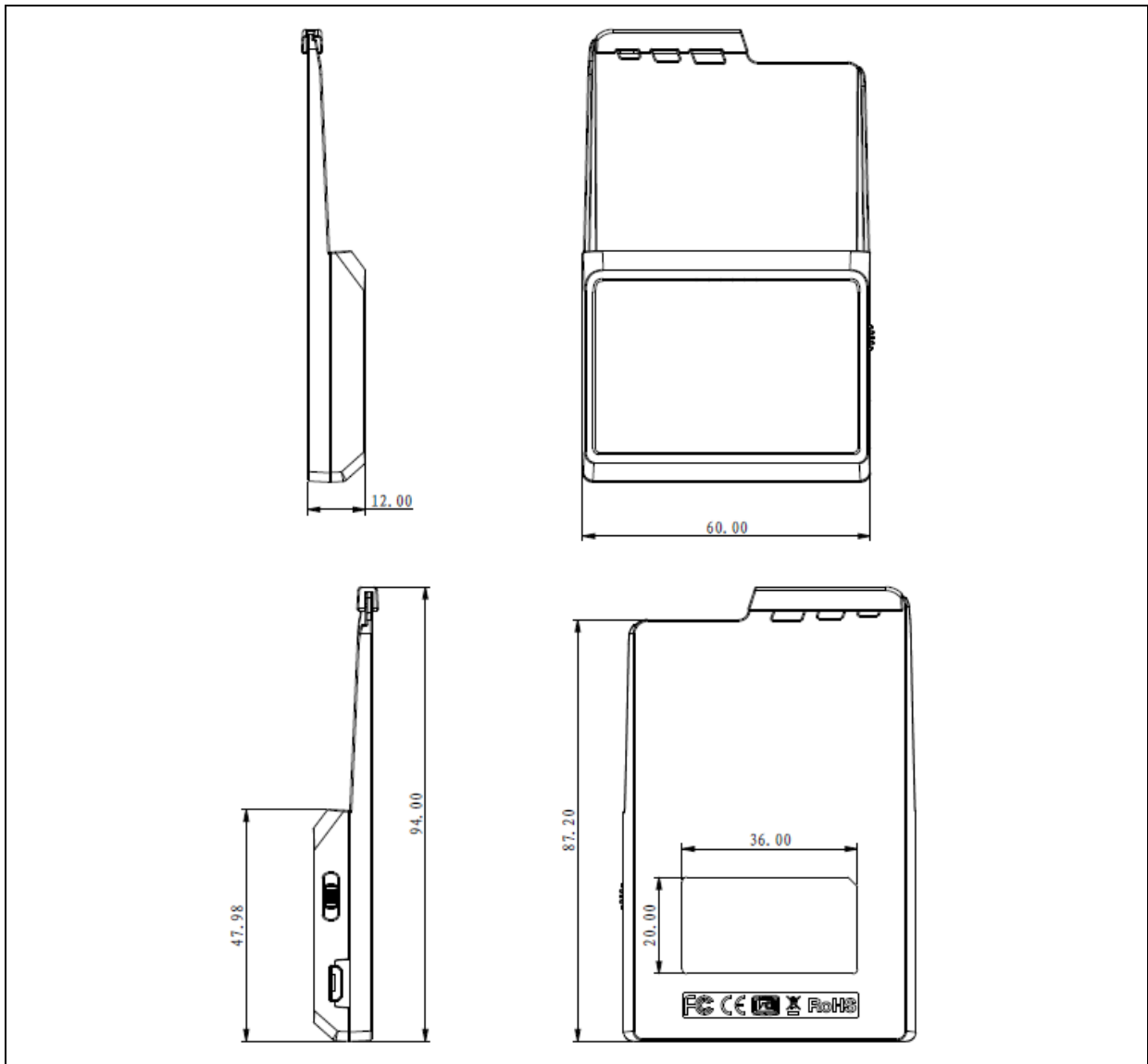


4.0. Typical Applications

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



5.0. Technical Specifications



Physical Characteristics

Dimensions 94 mm (L) x 60 mm (W) x 12 mm (H)
 Weight 30.8 g (59.7 g with cable ± 5 g allowance for cable)
 Colors Gray, White

Bluetooth Interface

Protocol Bluetooth Smart (Bluetooth Low Energy/Bluetooth 4.0)
 Power Source Rechargeable Lithium-ion Battery (charging through USB)
 Speed 1 Mbps

USB Host Interface

Protocol USB CCID
 Type Four Lines: +5 V, GND, D+ and D-
 Connector Type Micro-USB
 Power Source From USB port
 Speed USB Full Speed (12 Mbps)
 Supply Voltage 5 V
 Cable Length 1 m detachable cable



Contact Smart Card Interface

Number of Slots	1 Full-sized Card Slot
Standard	ISO 7816 Parts 1-3, 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

Firmware Upgrade Supported

Application Programming Interface

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

Operating Conditions

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

Certifications/Compliance

EN60950/IEC 60950, ISO 7816, USB Full Speed, Bluetooth® Smart, EMV™ Level 1 (Contact), PC/SC, CCID, CE, FCC, RoHS 2, REACH, VCCI (Japan), MIC (Japan), Microsoft® WHQL

Device Driver Operating System Support

Windows® ME, Windows® 98, Windows® 2000, Windows® XP, Windows Vista®, 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
Linux®, Mac OS®, Android™³, iOS⁴



Android is a trademark of Google Inc.
Atmel is registered trademark of Atmel Corporation or its subsidiaries, in the US and/or other countries.
EMV is a trademark of EMVCo LLC in the United States and other countries.
Infineon is a registered trademark of Infineon Technologies AG.
Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.
Mac OS is a trademark of Apple Inc., registered in the U.S. and other countries.
Microsoft, Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and/or other countries.
The Bluetooth® word, mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Advanced Card Systems Ltd. is under license. Other trademarks and trade names are those of their respective owners.

³ 4.3 and later Android versions is required for Bluetooth 4.0.

⁴ 5.0 and later iOS versions is required.