Advanced Card Systems Ltd.
Card & Reader Technologies

ACR1251U-A1
USB NFC Reader
with SAM

Technical Specifications V1.01
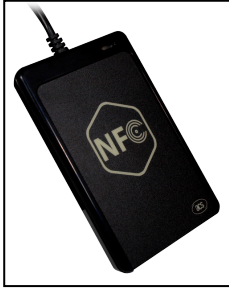
Table of Contents

1.0. Introduction

The ACR1251U-A1 is a PC-linked NFC smart card reader developed based on the 13.56 MHz contactless technology. Following the ACR122U, ACS's successful NFC reader and also the world's first CCID-compliant contactless reader, the ACR1251U-A1 offers more and advanced features. It is designed to support not only ISO 14443 Type A and B cards, but also MIFARE®, FeliCa and all four types of NFC tags and devices.

The ACR1251U-A1 is ideal for implementing contactless applications with added security functions in the system. By making use of the SAM (Secure Access Module), key diversification and mutual authentication is made possible, restricting the exposure of keys and limiting the possibility of keys being stolen, providing a high level of security in contactless operations.

ACR1251U-A1 is suitable for any contactless smart card application such as personal identity verification, network login, online banking and micropayment. With enhanced NFC features, ACR1251U-A1 is also ideal for non-conventional NFC applications like Smart Posters for advertising and marketing purposes, and communication with most NFC-enabled mobile phones in the market.

Furthermore, ACR1251U-A1 is PCSC-compliant that allows interoperability across different applications and platforms. ACR1251U-A1 also supports post-deployment firmware update through remote firmware upgrade, which eliminates the need for additional hardware modification. With its compact size, trendy design and rich features, ACR1251U-A1 enables you to fully enjoy the convenience of using NFC applications.

2.0. Features

- USB 2.0 Full Speed Interface
- CCID Compliance
- Smart Card Reader:
  - Read/Write speed of up to 424 kbps
  - Built-in antenna for contactless tag access, with card reading distance of up to 50 mm (depending on tag type)
  - Support for ISO 14443 Part 4 Type A and B cards, MIFARE, FeliCa, and all four types of NFC (ISO/IEC 18092 tags)
  - Built-in anti-collision feature (only one tag is accessed at any time)
  - NFC Support:
    - Card reader/writer mode
    - Peer-to-Peer mode
  - ISO 7816-compliant SAM slot
- Application Programming Interface:
  - Supports PC/SC
  - Supports CT-API (through wrapper on top of PC/SC)
- Built-in Peripherals:
  - User-controllable bi-color LED
  - User-controllable buzzer
- USB Firmware Upgradability
- Supports Android^{TM} 3.1 and above
- Compliant with the following standards:
  - ISO 18092
  - ISO 14443
  - ISO 7816
  - LASCOM
  - CE
  - FCC
  - VCCI
  - MIC
  - KC
  - PC/SC
  - CCID
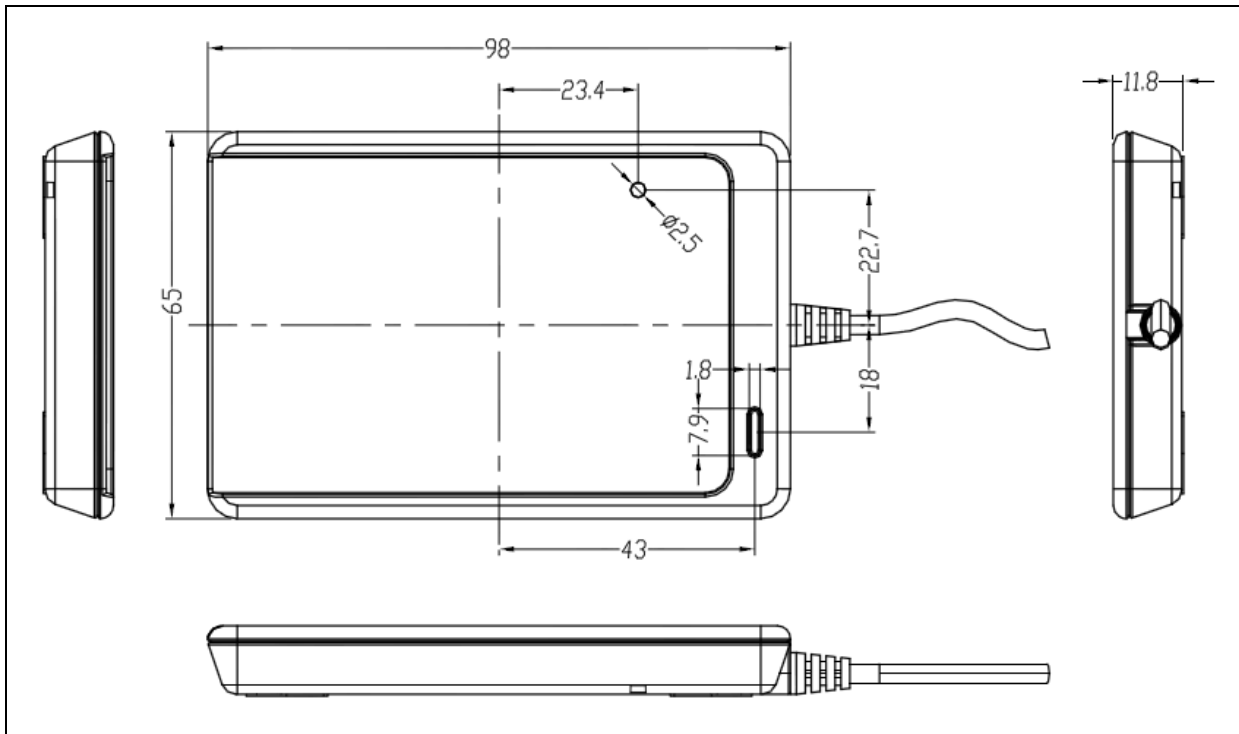 - Microsoft® WHQL
  - RoHS

3.0. Typical Applications

- e-Government

- e-Banking and e-Payment

- e-Healthcare

- Transportation

- Network Security

- Access Control

- Loyalty Program

- Smart Poster/URL Marketing

4.0. Technical Specifications

Universal Serial Bus Interface
Power Source.................................. From USB
Speed.. 12 Mbps (Full Speed)
Supply Voltage .... Regulated 5 V DC
Supply Current .... 200 mA (max.)

Contactless Smart Card Interface
Standard .... ISO/IEC 18092 NFC, ISO 14443 Type A & B, MIFARE, FeliCa
Protocol.. ISO 14443 T=CL for ISO14443-4 compliant cards and T=CL Emulation for MIFARE 1K/4K, ISO 18092, FeliCa and NFC tags
Operating Frequency .... 13.56 MHz
Operating Distance .... Up to 50 mm (depending on tag type)
Smart Card Read/Write Speed....... 106 kbps, 212 kbps, 424 kbps

SAM Card Interface
Standard .... ISO 7816
Protocol.. T=0 and T=1 protocol

Physical Specifications
Dimensions .... 98.0 mm (L) x 65.0 mm (W) x 11.8 mm (H)
Weight... 73 g
Material .... Acrylonitrile - Butadiene – Styrene (ABS)
Color .... Black
Antenna Size................................. 50 mm x 40 mm
Cable Length................................. 1.0 m (USB)

Built-in Peripherals
Bi-color LED .... Red and Green
Buzzer.. Monotone

Operating Conditions
Temperature .... 0 °C – 50 °C
Humidity .... 10% - 90%

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

Certifications/Compliance
ISO 18092, ISO 14443, ISO 7816, LASCOM, CE, FCC, VCCI, MIC, KC, PC/SC, CCID, RoHS, USB Full Speed, Microsoft® WHQL Windows® 2000, Windows® XP, Windows Vista®, Windows® 7, Windows® 8

Device Driver Operating System Support

Windows® 98, Windows® ME, Windows® 2000, Windows® XP, Windows Vista®, Windows® 7, Windows® 8, Windows® Server 2003, Windows® Server 2003 R2, Windows® Server 2008, Windows® Server 2008 R2, Windows® Server 2012

Linux, Mac, Android 3.1 and above