ACR123U
Intelligent Contactless Reader

Technical Specifications V1.06
1.0. Introduction

The ACR123U is the USB version of the cost-effective, flexible, and intelligent contactless reader ACR123S. It can be integrated to existing POS (Point-of-Sale) terminals or cash registers to offer the convenience of a cashless payment system. Developed based on the 13.56 MHz contactless RFID (Radio Frequency Identification) technology, it supports any contactless card following the ISO 14443-4 standard.

Similar with its serial predecessor, the ACR123U is equipped with a large graphical LCD screen that lets merchants display messages, as well as a large tapping area with backlight which guides customers in carrying out their payment transactions. ACR123U has a built-in ISO 7816–compliant SAM (Secure Access Module) slot which can be used together with a SAM card.

The ACR123U is compliant with major payment and safety standards such as MasterCard®, Visa®, American Express®, and EMV™ Levels 1 and 2 (Contactless), making it compatible with EMV-based contactless payment applications such as MasterCard® PayPass™, Visa payWave®, and American Express® ExpressPay. The ACR123U is also Apple Pay™ ready.

Using either the serial or USB version of the ACR123, movement in checkout counters is faster as customers complete their payment by simply tapping their cards. This presents an opportunity to revolutionize shopping experience in a faster and convenient payment world.
2.0. Features

- USB Interface for Data Communication and Power Supply
- ARM® Cortex®-M3 32-bit Processor
- Payment Applications:
  - MasterCard PayPass Mag Stripe and M/Chip
  - Visa payWave MSD and qVSDC
  - American Express ExpressPay 3.0
  - Apple Pay ready
- Smart Card Reader:
  - Contactless Interface:
    - Read/Write speed of up to 848 Kbps
    - Built-in antenna for contactless card access, with card reading distance of up to 50 mm (depending on tag type)
    - Supports ISO 14443 Part 4, Type A and B cards and MIFARE Classic® series
    - Supports MasterCard PayPass, Visa payWave, and American Express ExpressPay compliant cards
    - Built-in anti-collision feature
  - SAM Interface:
    - Three SAM Slots
    - Supports ISO 7816 Class A, B and C (5 V, 3 V, 1.8 V) SAM cards
- Built-in Peripherals:
  - 16 characters × 8 lines Graphical LCD (128 pixels × 64 pixels)
  - Four user-controllable LEDs (Blue, Yellow, Green, and Red)
  - User-controllable tapping region backlight (Red, Green, and Blue)
  - User-controllable speaker (Monotone indication)
- Certifications/Compliance:
  - ISO 14443
  - ISO 7816 Class A, B and C (SAM Slot)
  - EMV™ Levels 1 and 2 (Contactless)
  - MasterCard PayPass
  - Visa payWave
  - American Express ExpressPay
  - CE
  - FCC
  - RoHS 2
  - REACH
  - VCCI (Japan)
  - KC (Korea)
  - Microsoft® WHQL
3.0. Typical Applications

- Banking and Payment
- e-Healthcare
- Transportation
- e-Purse and Loyalty
- Contactless Mobile Payment
4.0. Technical Specifications

### Physical Characteristics

**Dimensions**
- Main Body: 159 mm (L) × 100 mm (W) × 21 mm (H)
- With Stand: 177.4 mm (L) × 100.0 mm (W) × 94.5 mm (H)

**Weight**
- Main Body: 281 g
- With Stand: 506 g

**Color**
- Black

**Processor**
- Core: ARM 32-bit Cortex-M3 CPU

**USB Host Interface**
- Protocol: USB CCID
- Connector Type: Standard Type A
- Power Source: From USB port
- Speed: USB Full Speed (12 Mbps)
- Supply Voltage: 5 V
- Supply Current: Max. 500 mA
- Cable Length: 1.5 m, Fixed

**Contactless Smart Card Interface**
- Standard: ISO 14443-4 Type A and B Parts 1-4
- Protocol: ISO 14443 T=CL for ISO 14443-4–compliant cards
- T=CL Emulation for MIFARE Classic
- 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, 848 Kbps
- Antenna Size: 75 mm × 75 mm

**SAM Card Interface**
- Number of Slots: 3 Standard SIM-sized Card Slots
- Standard: ISO 7816, Class A, B, C (5 V, 3 V, 1.8 V)
- Protocol: T=0; T=1
- Smart Card Read/Write Speed: 9.6 Kbps – 344 Kbps
- Card Connector Type: SAM Slot 0: Contact
- SAM Slot 1: Contact
- SAM Slot 2: Contact
**Built-in Peripherals**

**LCD** ................................................ Graphic LCD with white backlight
....................................................... 128 pixels × 64 pixels
....................................................... Number of characters: 16 characters × 8 lines
**LED** ................................................ 4 single-color: Blue, Yellow, Green, and Red
**Speaker** .......................................... Audio tone indication
**Tapping Region** .............................. Tri-color backlight: Red, Green and Blue

**Other Features**

**Security** .......................................... Tamper Switch (Internal anti-intrusion detections and protection)
**Firmware Upgrade** .......................... Supported
**Real-time Clock** .............................. Supported

**Operating Conditions**

**Temperature** .................................... 0 °C – 50 °C
**Humidity** ......................................... Max. 90% (non-condensing)
**MTBF** ............................................. 240,000 hrs

**Certifications/Compliance**

ISO 14443, ISO 7816 (SAM Slot), EMV Levels 1 and 2 (Contactless), MasterCard PayPass, Visa payWave,
American Express ExpressPay, PC/SC, CCID, CE, FCC, RoHS 2, REACH
VCCI (Japan), KC (Korea), Microsoft® WHQL

**Device Driver Operating System Support**

Windows® CE 5.0, Windows® CE 6.0, Windows® Embedded Compact 7, Windows® 2000, Windows® XP,
Windows® Server 2012 R2
Linux®

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