ACR123S
Intelligent Contactless Reader
Technical Specifications V1.08
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1.0. Introduction

The ACR123S is a cost-effective, flexible, and intelligent contactless reader that 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.

Aside from its advanced contactless features, the ACR123S 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.

ACR123S has a built-in ISO 7816–compliant SAM (Secure Access Module) slot which can be used together with a SAM card.

ACR123S, a high quality and reliable device, is compliant with major payment and safety standards such as MasterCard®, Visa®, and EMV™ Levels 1 and 2 (Contactless). ACR123S is also compatible with EMV-based contactless payment applications such as MasterCard® PayPass™, Visa payWave®, and American Express® ExpressPay. The ACR123S is also Apple Pay™ ready.

With the ACR123S, movement in checkout counters are 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

- Serial RS-232 Interface with RJ45 Connector for Data Communication
- USB Interface for 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 (Audio tone indication)
- Certifications/Compliance:
  - ISO 7816 Class A, B and C (SAM Slot)
  - ISO 14443
  - EMV Levels 1 and 2 (Contactless)
  - MasterCard PayPass
  - Visa payWave
  - American Express ExpressPay
  - CE
  - FCC
  - RoHS 2
  - REACH
  - VCCI (Japan)
  - KC (Korea)
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

**Serial Host Interface**

Protocol .......................................... RS-232
Connector Type .............................. RJ45 connector
Power Source .................................... From USB port
Speed ............................................. 9.6 Kbps (default), 19.2 Kbps, 38.4 Kbps, 57.6 Kbps, 115.2 Kbps, 230.4 Kbps
Supply Voltage ............................... 5 V
Supply Current ............................... Max. 500 mA
Cable Length .................................. 1.5 m, Fixed (RJ45 + USB)

**Contactless Smart Card Interface**

Standard ........................................ ISO 14443 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
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 7816 (SAM Slot), ISO 14443, EMV Levels 1 and 2 (Contactless), MasterCard PayPass, Visa payWave, American Express ExpressPay, CE, FCC, RoHS 2, REACH
- VCCI (Japan), KC (Korea)

### Device Driver Operating System Support

- Linux®