



**Advanced Card Systems Ltd.**  
Card & Reader Technologies

# ACR123S Intelligent Contactless Reader

Technical Specifications V1.07





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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)

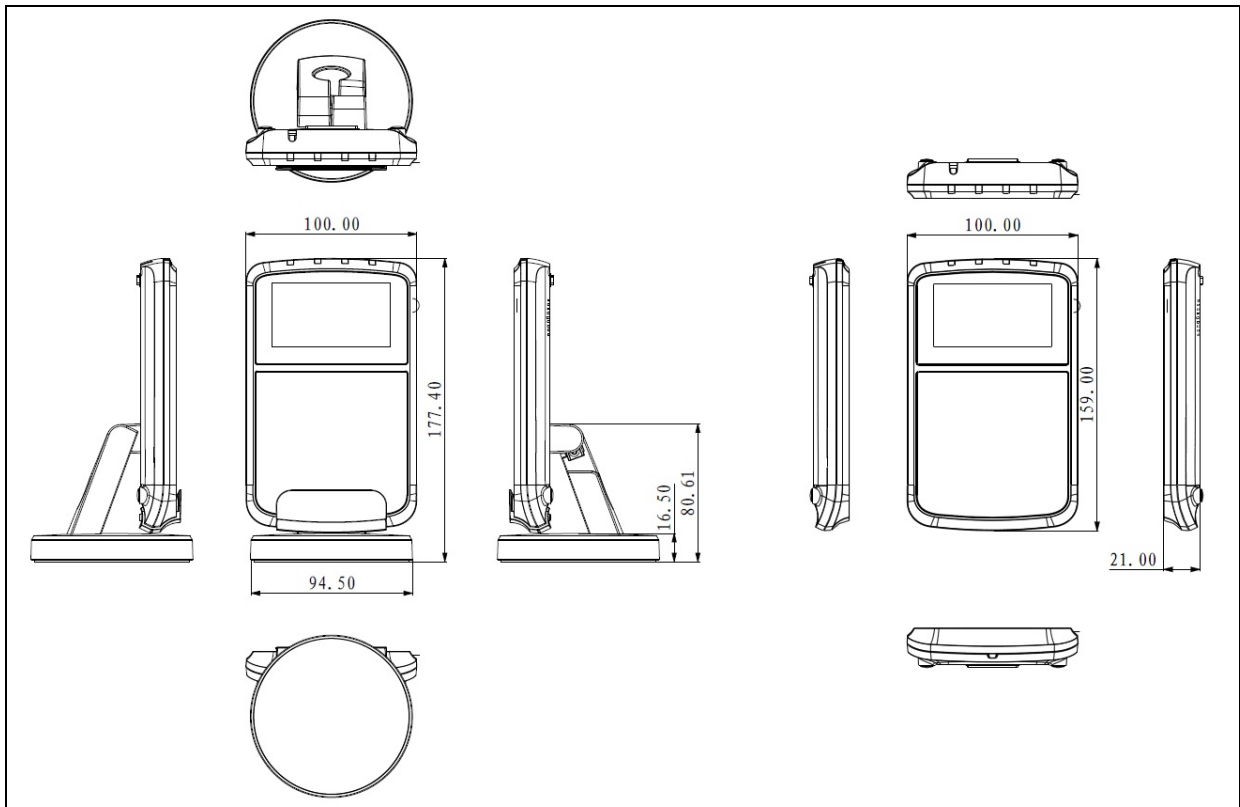


### **3.0. Typical Applications**

- 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) x 100 mm (W) x 21 mm (H) With Stand: 177.4 mm (L) x 100.0 mm (W) x 94.5 mm (H)
Weight.....	Main Body: 281 g With Stand: 506 g
Color .....	Black

### Processor

Core .....	ARM 32-bit Cortex-M3 CPU
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### 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 (DB9 + 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 x 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 x 64 pixels  
 ..... Number of characters: 16 characters x 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**

Windows® CE 5.0, Windows® 2000, Windows® XP, Windows Vista®, Windows® 7, Windows® 8.1, Windows® 10  
 Windows® Server 2003, Windows® Server 2008, Windows® Server 2008 R2  
 Linux®



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