



Advanced Card Systems Ltd.
Card & Reader Technologies

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

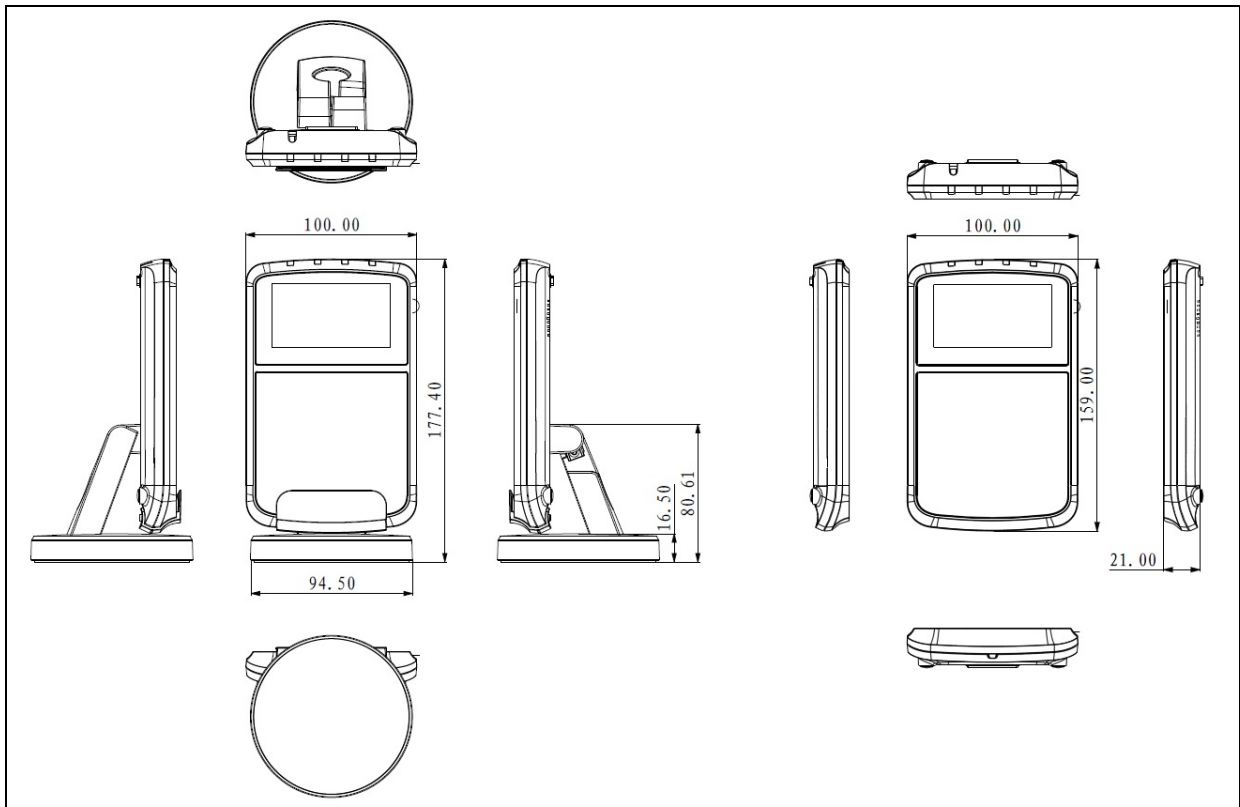
- Serial RS-232 Interface with RJ45 Connector for Data Communication
- USB Interface for Power Supply
- ARM® Cortex®-M3 32-bit Processor
- Payment Applications:
 - MasterCard PayPass Mag Stripe and M/Chip
 - Visa payWave MSD and qVSDC
 - American Express ExpressPay 3.0
 - Apple Pay ready
- Smart Card 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
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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 (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

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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