Advanced Card Systems Ltd.
Card & Reader Technologies

ACR900
Handheld EMV Terminal

Technical Specifications V1.01

Subject to change without prior notice

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1.0. Introduction

The ACR900 uses a 32-bit secure MCU core and is designed for transactions using payment cards. It offers high performance features that support complex applications and provides a large memory to maximize data storage.

The ACR900 provides connectivity options to support online functionalities. It is capable of communicating online with a back-end server via TCP/IP and WiFi. Furthermore, the ACR900 also provides mobile connectivity option via GPRS and WCDMA, which will enable the device to connect to the bank's back-end server. It is also compact and portable enough to be used as a handheld terminal.

A built-in thermal printer is added to its design to print receipts on hand. Aside from e-banking and e-payment, the device may also be used for e-purse, e-government, healthcare, and transportation applications. Its payment security is assured through its compliance with international payment standards.

2.0. Features

- 32-bit Secure Processor running Embedded Secure Linux®
- 512 MB Flash and 256 MB RAM
- Expandable Micro SD Card support with memory from 1 GB up to 32 GB
- Connectivity Support
  - Wi-Fi
  - GPRS/GSM quad band (850 MHz, 900 MHz, 1800 MHz, 1900 MHz)
  - 3G connectivity support (900 MHz/2100 MHz or 850 MHz/1900 MHz)
  - Ethernet (Optional)
- Contact Interface:
  - One Full-sized Contact Card Slot (Landing Connector)
  - Supports ISO 7816 Class A, B, and C (5 V, 3 V and 1.8 V) cards
  - Supports microprocessor cards with T=0 or T=1 protocol
  - Supports extended APDU
- Contactless Interface:
  - Integrated Contactless Smart Card Interface
  - Read/Write speed of up to 424 Kbps
  - Supports ISO 14443 Part 1-4 Type A and B cards, MIFARE Classic®, MIFARE® DESFire®
  - Supports ISO 18092, FeliCa
  - Built-in antenna for contactless tag access, with card reading distance of up to 40 mm (depending on tag type)
  - Built-in anti-collision feature (only one tag is accessed at any time)
- SAM Interface:
  - Four SAM-sized Card Slots (Contact Connector)
  - Supports ISO 7816 Class A, B, and C (5 V, 3 V and 1.8 V) cards
- SIM Interface:
  - One SIM-sized Card Slot for GPRS/3G
- Magnetic Stripe Card Support
- Built-in-Peripherals
  - 2.8-inch Easy-to-Read, High Resolution Colored LCD
  - Highly Durable 22-button Keypad
  - Thermal Printer
  - Real-time Clock (RTC) with independent backup battery
  - 4 LED Status Indicators (Blue, Yellow, Green and Red)
  - Built-in Speaker

- Compliant with the following standards:
  - ISO 7816
  - ISO 14443
  - ISO 7811
  - EMV® Contact Levels 1 and 2
  - EMV® Contactless Levels 1 and 2
  - MasterCard® Contactless
  - Visa payWave®
  - CE
  - FCC
  - RoHS

3.0. Supported Card Types

3.1. MCU Cards

The ACR900 operates with MCU cards that follow:

- T=0 or T=1 protocol
- ISO 7816-compliant Class A, B, C (5 V, 3 V, 1.8 V)

3.2. Contactless Cards

The ACR900 supports the following contactless cards:

- ISO 14443-compliant, Type A and B Standard, Parts 1 to 4
- T=CL protocol
- MIFARE Classic®
- MIFARE Ultralight®
- MIFARE® DESFire®
- MIFARE Plus®
- FeliCa

3.3. Magnetic Stripe Cards

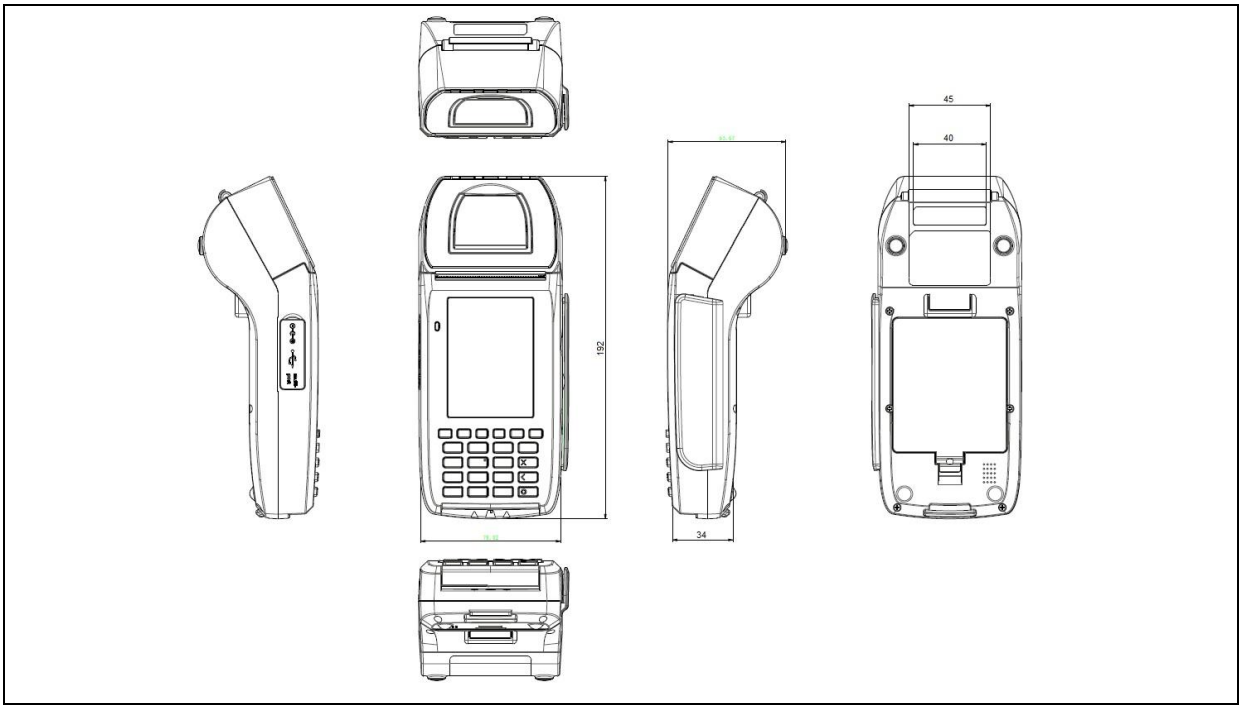
The ACR900 supports the following magnetic stripe cards:

- ISO 7811 Tracks 1, 2 and 3
- Bi-directional

4.0. Typical Applications

- Banking and Payment
- Transportation
- e-Purse
- e-Government
- Healthcare

5.0. Technical Specifications



Physical Characteristics	
Dimensions	192 mm (L) x 83 mm (W) x 68 mm (H)
Weight	513g (including battery and thermal paper)
Case Color	White
Processor	
32-bit 384MHz Secure Processor	
Operating System	
Embedded Secure Linux®	
Power	
Power Source	External Power Adapter
Battery	Lithium Ion, 7.4 V, 2000 mAh
Memory	
Flash	512 MB
RAM	256 MB
Micro SD Memory Card Size	Up to 32 GB
Connectivity	
Ethernet (Optional)	Built-in 10/100-base-T
Wi-Fi	IEEE 802.11 b/g/n
Quad-band GSM/GPRS	850MHz/900MHz/1800MHz/1900MHz
WCDMA	900MHz/2100MHz or 850MHz/1900MHz
Contact Smart Card Interface	
Standard	ISO 7816 Class A, B, C (5 V, 3 V, 1.8 V), T=0 and T=1
Number of Slots	One (1) Full Sized
Supply Current	Max. 50 mA
Short Circuit Protection	+5 V/GND on all pins
Card Insertion Cycles	Min. 100,000
Contactless Smart Card Interface	
Standard	ISO 14443 A and B, MIFARE®, FeliCa
Protocol	ISO14443, ISO18092, T=CL protocol
Operating Frequency	13.56 MHz
Operating Distance	Up to 40 mm
Magnetic Stripe Card	
Standard	ISO 7811, Track 1/2/3, Bi-directional

SAM Card Interface

Card Connector Type ..... Contact
Standard ..... ISO/IEC 7816
Number of slots ..... Four (4) SAM Slots
Card Size ..... Standard (or 2FF, 2nd Form Factor), ISO/IEC 7810:2003 ID-000, 25.0 mm x 15.0mm

SIM Card Interface

Standard GSM11.11
Number of slots ..... One (1) Standard SIM-sized
Card Size ..... Standard (or 2FF, 2nd Form Factor), ISO/IEC 7810:2003 ID-000, ... 25.0 mm x 15.0 mm

Built-in Peripherals

Keypad ..... 22 keys
LCD Display ..... 2.8 inch, 240 x RGB x 320 Full Color TFT LCD
Audio Speaker ..... 20 Hz – 20 KHz
LED Status Indicators ..... 4 LEDs (Blue, Yellow, Green and Red)

Printer

Printer Type ..... Thermal
Number of Dot/Line 384
Resolution ..... 203 DPI
Print Width ..... 48 mm
Max Speed ..... 85 mm/sec
Paper Width ..... 57 mm
Max. Paper Roll Diameter ..... 40 mm

Operating Conditions

Temperature ..... 0°C – 50°C
Humidity ..... Max. 90% (non-condensing)

Certifications/Compliance

ISO 7816, ISO 14443, ISO 7811, EMV® Contact Levels 1 and 2, EMV® Contactless Levels 1 and 2, MasterCard® Contactless, Visa payWave®, Apple Pay® ready, CE, FCC, RoHS