



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

# ACR880 GPRS Portable Smart Card Terminal



Technical Specifications



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## 1.0. Introduction



The ACR880 GPRS Portable Smart Card Terminal is a secured and portable smart card terminal that safeguards and streamlines various transactions. This innovative device is capable of facilitating secured mutual authentication between a smart card and a reader, detailed multi-layered information from the cards based on embedded access rights, and transactions through both public and private network infrastructures. It can offer solutions to different applications including e-Healthcare, e-Government, e-Banking and e-Payment.

ACR880 may function with or without its cradle, thus giving users the option to use it either as a powerful desktop device with other peripherals like *magstripe* readers and thermal printers, or as a standalone and handheld reader that may be used in field works. It has Secure PIN Entry (SPE) to protect every PIN code entered into the device from security attacks while it is on desktop mode. It also has GPRS connectivity to allow data transmission even with the reader on standalone mode.

Other features of ACR880 include a dual smart card interface, contactless card reader module, USB and RS232 connectivity, integrated TCP/IP networking support, multiple SAM slots, a 128 x 64 high resolution graphical LCD, a user-friendly 20-button keypad, multiple bi-colored status LEDs, a highly-audible speaker and a real-time onboard clock. It allows addition of features like high-speed Wi-Fi access and enables firmware upgrades to be able to adapt to the changes of future security systems.



## 2.0. Features

- 32-Bit ARM 9 Processor running on Embedded Linux
- 32 MB Flash and 32 MB SDRAM Memory
- GPRS/GSM quad band (850, 900, 1800, 1900 MHz)
- Long Battery Life for All Day Use
- Charging via Docking Cradle
- Support ISO 7816 Microprocessor Smart Cards with the following features:
  - Class A, B, and C (5 V, 3 V, 1.8 V) cards
  - T=0 and T=1 Protocol
- Supports ISO 14443 Contactless Smart Cards
  - Type A and B Standard
  - Parts 1 to 4 and T=CL Protocol
  - Mifare Classic
- Certification / Compliance
  - ISO 7816
  - ISO 14443
  - PC/SC
  - USB Full Speed
  - CE
  - FCC
  - EMV 2000 4.0 Level 1
  - ROHS
- Dual Interface Reader (Contact and Contactless)
- Dual Operation Modes (PC-Linked/Standalone)
- 2 Full-Sized Contact Card Slots (Landing Connector)
- 2 SAM-Sized Card Slots (Contact Connector)
- USB Host & Client Full Speed/Serial/Ethernet Interface
- Firmware Upgradeable
- Hand-held Size and Weight
- Easy-to-Read, High Resolution Backlit LCD
- Highly Durable Chemical Resistant 25-Button Keypad
- 4 LED Status Indicators
- Built-in Speaker
- Tamper Detection Switch to Protect Against Unauthorized Intrusion
- Real-Time Clock (RTC) with Independent Backup Battery
- Secure PIN Entry (SPE) Support
- PPS (Protocol And Parameters Selection) Support with 9,600—230,400 bps In Reading and Writing Smart Cards
- (Optional) Built-in Fingerprint Sensor
- (On Request) Wi-Fi
- (On Request) Colored LCD
- (On Request) Internal Microphone
- (On Request) Cigarette Lighter Adapter



## **3.0. Supported Card Types**

### **3.1. MCU Cards**

ACR880 operates with MCU cards that follow:

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

### **3.2. Memory-based Smart Cards (Synchronous Interface)**

The ACR880 supports the following memory cards:

- Cards following the I2C bus protocol (free memory cards) such as:
  - Atmel: AT24C01 / 02 / 04 / 08 / 16
- SLE4432/5542 intelligent 256 bytes EEPROM with write protect function:
  - SLE4432, SLE5542
- SLE4418/5528 intelligent 1K bytes EEPROM with write-protect function:
  - SLE4418, SLE5528

### **3.3. Contactless Cards**

ACR880 supports the following contactless cards:

- ISO 14443 Compliant, Type A & B Standard, parts 1 to 4, T=CL protocol
- Mifare® Classic



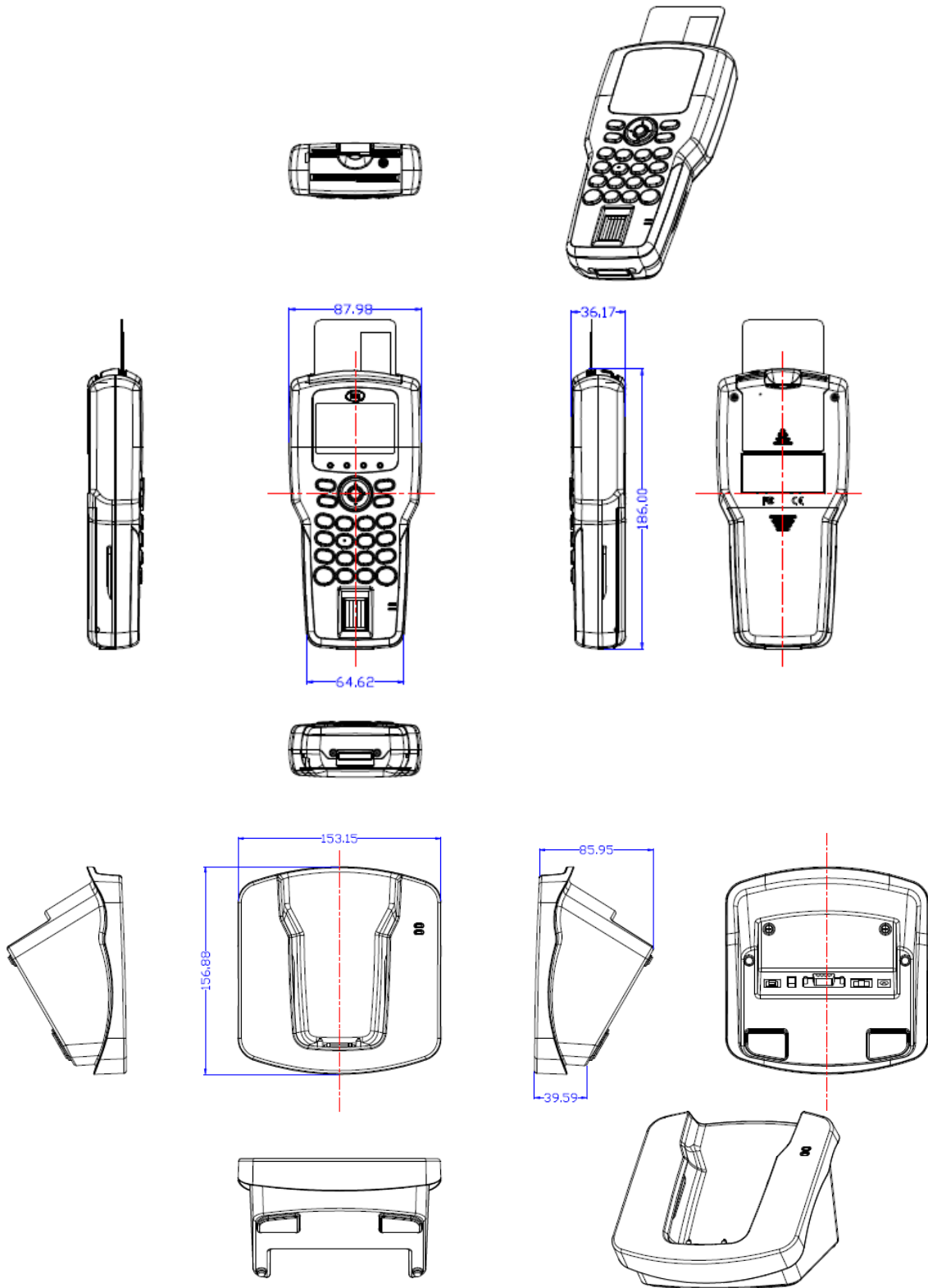
## 4.0. Typical Applications

- e-Healthcare
  - Medical Identification
  - Digital Signatures
  - Digital Prescriptions
  - Patient Data and History
  - Billing Transactions
- e-Government
- e-Banking and e-Payment
- Transportation
- Loyalty Program
- Time and Attendance Checking





## 5.0. Technical Specifications





### Processor

32-Bit Arm 9 Processor

### Operating System

Embedded Linux 2.6

### Memory

Memory ..... 32 MB flash + 32 MB SDRAM

### Power

Supply Voltage ..... 12 V DC  
 Supply Current..... Max. 1 A  
 Power Source..... External Power Adapter  
 ..... Rechargeable and Replaceable Lithium Ion Battery Pack (Standby Time: 14 hours,  
 Operation Time: 5-7 hours depending on the type of usage)  
 Back-up Battery ..... Independent Back-up Battery (1 x CR2032) for Internal Real Time Clock and 240-byte  
 Tamper-Protected Storage  
 Charging..... Via Cradle

*Note: Operation time estimation is based in 6 transactions per minute. Actual results may vary.*

### Connectivity

USB ..... USB 1.1 Full Speed, 12 Mbps  
 RS232 ..... 3 lines Rx/D, Tx/D and GND  
 Ethernet..... 10/100 Mb Auto-negotiate  
 GPRS/GSM ..... Quad Band (850, 900, 1800, 1900 MHz)  
 Ethernet..... Through external rear mounted Wi-Fi module

### Smart Card Interface

#### Contact – Standard

Smart Card Slots ..... 2 ID-1 Slots  
 Card Connector Type ..... Landing  
 Standard..... ISO 7816 Class A, B, C (5 V, 3 V, 1.8 V), T=0 and T=1,  
 Supply Current..... Max. 50 mA  
 Smart Card Read / Write Speed ..... 9,600-230,400 bps  
 Card Insertion Cycles ..... 200,000 (minimum)  
 Short Circuit Protection ..... +5 V / GND on all pins

#### Contact - SAM

SAM Card Slots ..... Two ID-000 slots  
 Card Connector Type ..... Contact  
 Smart Card Read / Write Speed ..... 9,600-250,000 bps

#### Contactless

Standard..... ISO 14443 A & B part 1-4  
 Protocol ..... Mifare® Classic Protocols, T=CL  
 Smart Card Read / Write Speed ..... 106, 212, 424, 848 kbps  
 Operating Distance..... Up to 60 mm at 106 kbps  
 Operating Frequency..... 13.56 MHz

### Firmware Upgrade Interface

Firmware Upgradeable

### Human Interfaces

Keypad ..... 20 keys (4 Function keys, 4 Direction keys, 10 Number keys, 1 Clear key, 1 Enter key)  
 LCD Display ..... 128 x 64 dot matrix black and white graphic LCD with backlighting  
 ..... Window size: 49 mm x 29 mm; Active area size: 46 mm x 28 mm  
 ..... Number of characters on LCD: User-definable (Max: 21 characters x 8 rows)  
 Audio Speaker..... 20 – 20 kHz audio  
 LED Status Indicators ..... 4 LEDs for indicating status (LED1 &2: Red/Green; LED 3: Red; LED4: Green)  
 Tamper Switch..... Internal anti-intrusion detection and protection

### Physical Specifications

Dimensions..... Device: 88 mm (L) x 186 mm (W) x 36 mm (H) (subject to change)  
 ..... Cradle: 153 mm (L) x 157mm (W) x 88 mm (H) (subject to change)  
 Case Color ..... Dark Blue  
 Weight ..... Device: 348 g (with battery); Cradle: 613 g (subject to change)

### Operating Conditions

Temperature..... 0 °C to 50 °C





Humidity ..... 40% to 80%, non-condensing

**Certifications/Compliance**

EMV2000 v4.0 Level 1, CE, FCC, RoHS, ISO 7816, ISO 14443, PC/SC



**Other Features**

Real-Time Clock

**API**

PC/SC, CT-API, OCF, ACS API for peripheral monitoring and control