

# ACR-88

## Smart Card Reader

With the increasingly wide acceptance of smart card in the market in the recent years, smart card applications have gained maturity in terms of its level of sophistication and coverage in the market. With this, a versatile smart card reader becomes an emergent need.

**ACR88** is a versatile handheld portable smart card reader, having a **built-in keypad**, **LCD display** and **buzzer** features. It can also host additional features like **fingerprint scanner**, **contactless card reader** or **non-volatile memory** to enhance the security and give better support to your system. In addition, its onboard memory enables future firmware and application enhancements that guarantee against obsolescence.



ACR88 is a line of secured electronic devices of pocket size designed primarily for multi-application. It is capable of performing secure authentication, displaying rich information from the card, conducting online or offline transaction.

With ACR88, and its robust development platform, Astro Builder, users can now easily build their own applications loadable to the Astro platform, complementary to the many common functional features already available in the platform. No more programming in lower level languages, or dealing with kernel development and other hardware platform dependent issues! Application developers can now use the set of well-defined easy-to-use commands provided, and have full rein of realizing the limitless possibilities which your application will bring.

### Features

- Ergonomic and highly durable keypad
- Easy-to-read, graphical LCD
- Monotone buzzer with software controlled ON/OFF
- Accepts 3 V and 5V cards: two full-size cards and 3 SAM cards
- Real-time clock (RTC)
- Requires no additional power supply in PC-Linked mode
- Automatically switch to 3 x AAA battery power in standalone mode
- Independent backup battery (1 x CR2032) for RTC
- Field upgradeable for firmware (requires a firmware upgrade cable)
- On-board memory for standalone program (script loadable)
- Tamper switch which protect fraudulent intrusion
- Hand-held size and weight
- (Optional) Integrated UPEK TFM fingerprint sensor (Available in Q2 2006)
- (Optional) Contactless card reader (Available in Q3 2006)
- (Optional) Non-volatile memory for font storage (Available in Q2 2006)

### International Standards and Certifications

- CCID compatible
- CE and FCC certified
- EMV 2000 v4.0 Level 1
- ISO 7816

Note : All specifications are subject to change without notice



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## Supported Card Types

### MCU Cards

The ACR88 can operate MCU card with T=0 and T=1 protocol.

### Typical Applications

- Customer Loyalty
- E-Purse
- One-time password generator
- Secure Home-banking
- Computer System Logon
- Healthcare applications – medical identification
- E-government applications

### Optional Fingerprint Scanner (Available in Q2 2006)

With a fingerprint scanner integrated to the ACR88 handheld portable smart card reader, identification authentication can be done with ease, bringing forth even higher security protection to your system. The UPEK TFM fingerprint sensors are robust and are combined with our ACR88 core as an integrated device ACR88U-FPA. The algorithm and authentication are secure and processed in the TFM itself, meaning no crucial information can be tapped through the USB cable between the ACR88 device and the PC.

### Optional Contactless Card Reader (Available in Q3 2006)

With a contactless smart card reader module integrated to the ACR88 handheld portable smart card reader, you can now benefit from the versatility of the ACR88 device coalesced with the convenience of contactless smart card applications.

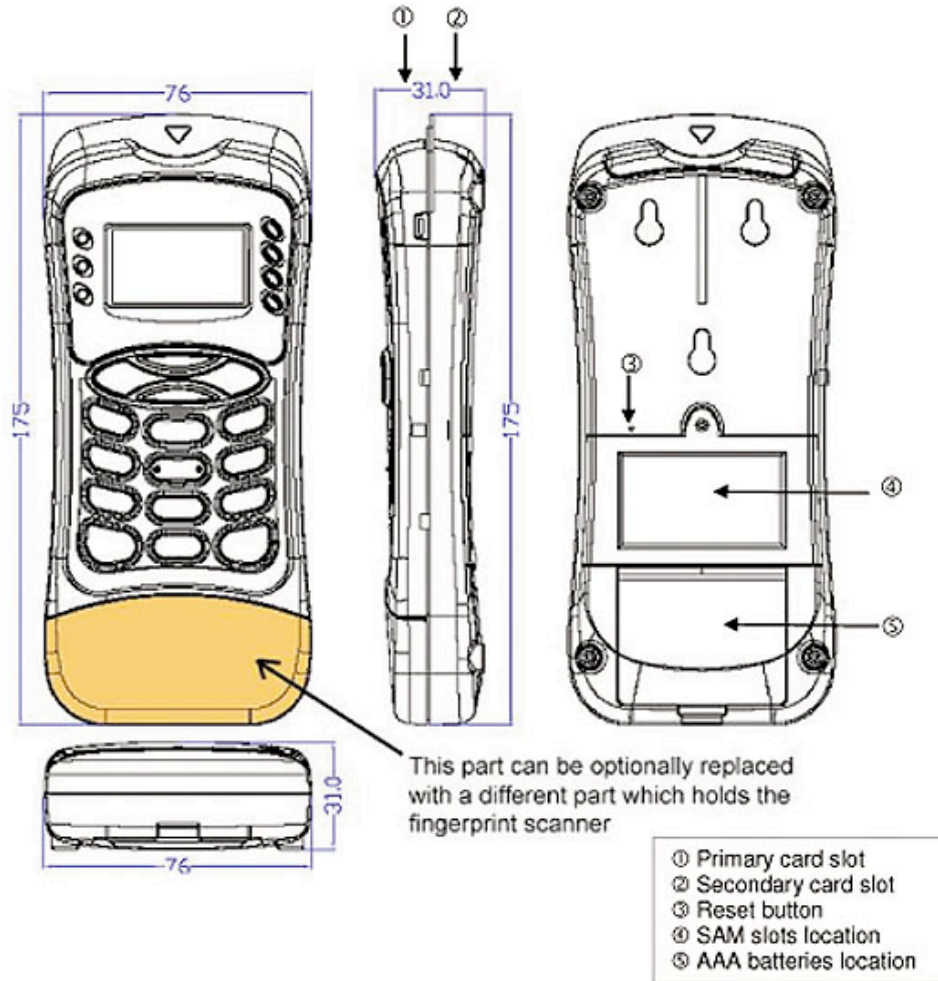
The contactless card reader is optional and is compliant to Mifare® standards. For more information about ISO 14443 Type A and Type B card support, please kindly contact our salespeople.

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**Power**

Operating voltage.....3.3V  
 Operation mode.....PC-Linked and Standalone  
 PC-Linked mode.....automatically switch to USB bus power, always ON  
 Standalone mode.....automatically switch to 3 x AAA-size battery power, soft ON/OFF switch  
 Power consumption.....Less than 100mA (excluding card power) in standalone mode  
 Backup battery.....Independent backup battery (1 x CR2032) for RTC

**Smart Card Interface**

Standard.....ISO-7816 Class A, B (5V, 3V), T=0 and T=1  
 Supply current.....max. 60mA  
 Smart card read / write speed.....9,600-115,200 bps (primary/secondary slot)  
 CLK frequency.....3.58 MHz  
 Card connector type.....Landing/ Contact ((primary/secondary slot)  
 Card insertion cycles.....min. 300,000 / min 100,000 (primary/secondary slot)  
 Short circuit protection .....+5V / GND on all pins

**SAM Card Interface (Optional)**

Card connector type.....Contact  
 Location.....Under the removable grey lid , please refer to the photo on the last page

**Contactless Smart Card Interface (Optional)**

Standard.....Mifare® Standard  
 Protocol .....Mifare® Classics protocols, Mifare® DESFire protocols  
 Smart card read / write speed.....106 kbps

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### **Fingerprint Scanner Interface (Optional)**

Power consumption .....Active mode: 20mA @ 5V + 105mA @ 3.3V  
Sleep mode: < 1mA @ 5V + 70\_A @ 3.3V  
Active sensor size.....12.8 x 18 mm  
Array size .....256 x 360 pixels  
Image resolution .....508 DPI  
ESD tolerance .....+/- 15kV air discharge

### **Universal Serial Bus Interface**

USB Cable.....USB 1.1 Full Speed, 12 Mbps, detachable  
Power Source .....from USB

### **Firmware Upgrade Interface (Optional)**

Firmware Upgrade Cable.....6-pin serial cable, 115,200 bps, detachable  
Power Source .....from USB

### **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 LCD with backlight  
Buzzer.....Monotone buzzer with software controlled ON/OFF  
Dual color LED power indicators.....(LED 1) GREEN indicates device power on; RED indicates low battery  
.....(LED 2) GREEN indicates primary card slot power on; ORANGE indicates primary card slot I/O activity  
.....(LED 3) GREEN indicates secondary card slot power on; ORANGE indicates secondary card slot I/O activity  
Tamper switch.....Built inside the case which protect fraudulent intrusion

### **Script Memory**

Non-Volatile Memory (EEPROM) .....4KB for script binary storage  
RAM .....300B

### **Physical Specifications**

Dimensions.....Device: 175mm (L) x 76mm (W) x 31mm (H)  
.....USB cable length: 1.5m; Firmware upgrade cable (optional): 1.5m  
Case Color.....Silver and Grey  
Weight.....Device: 95g; USB cable: 60g; Firmware upgrade cable (optional): 45g

### **Operating Conditions**

Temperature.....0°C to 50°C  
Humidity.....40% to 80%, non-condensing

### **Operation Systems**

Windows 98, ME, 2K, XP

### **Standard/Certifications**

EMV Level 1, ISO-7816, CE, FCC

### **Astro Platform for User Firmware Development (Optional, Available in Q3 2006)**

Language.....Programmable in C Language  
Real Time Emulation  
Debugging features..... load, step, go, stop, and break  
Without Emulator..... code size ≤ 52KB  
With Emulator..... code size up to 64KB

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**Others**

Reset Button.....Obscure small hole just above SAM door for hardware reset  
Privacy Cover (Optional) .....Removable privacy cover for keypad  
Non-volatile memory (EEPROM) .....64KB (4KB for script binary storage)  
Real Time Clock

**OEM**

OEM-Logo possible, customer-specific colors, casing and card connector, multilingual font support



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