



Advanced Card Systems Ltd.
Card & Reader Technologies

ACR1251U-A

User Manual

V1.00.00

Document Name:
ACR1251U-A User Manual.doc

Prepared by:	Reviewed by:	Approved by:



Version History

Date	By	Changes	Version
2012-1-3	Vincent Zhong Lampard Ou Kit Au	<ul style="list-style-type: none">• First Release	1.00.00
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1.0. Introduction

The ACR1251U is a dual-interface reader (IFD and PCD) that supports contact (SAM) and contactless (PICC) smart cards.

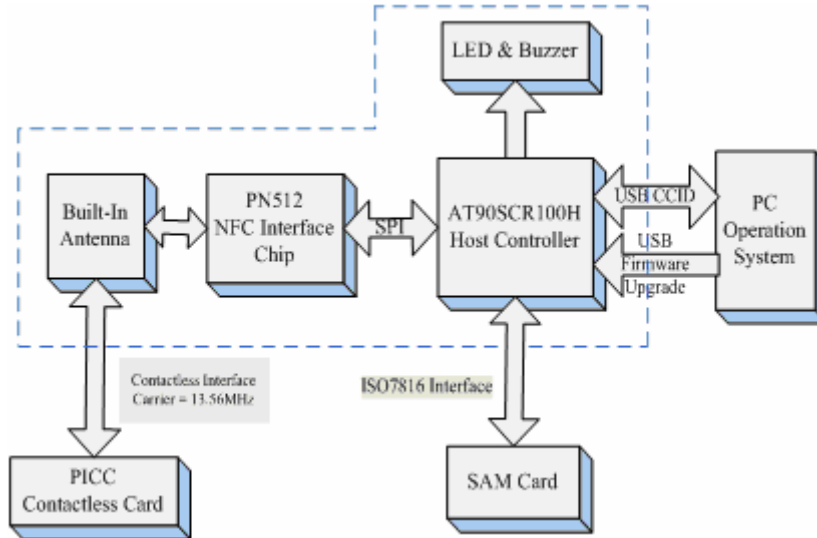


2.0. Features

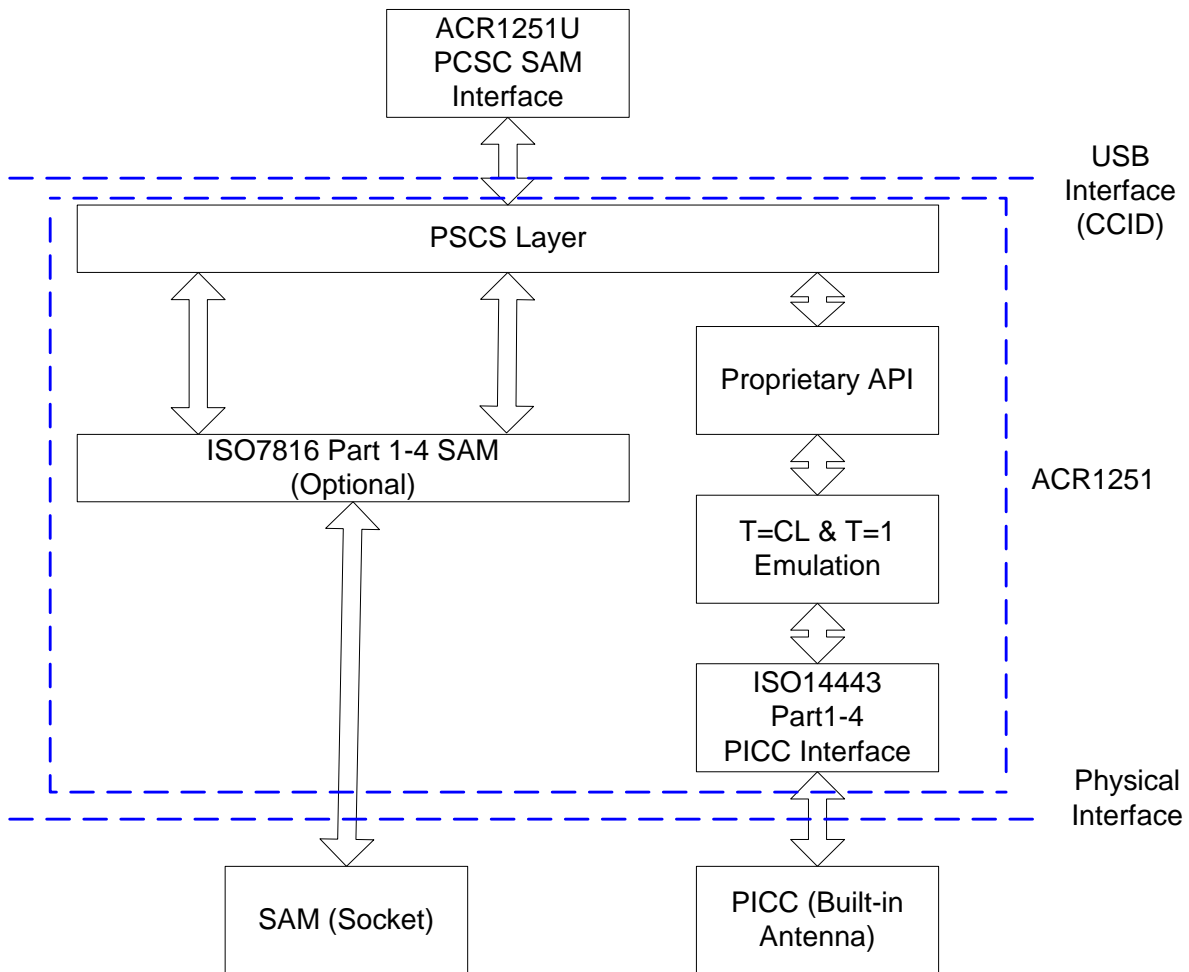
- One standard SIM Size Connector.
- ISO 7816 Parts 1-4 Compliant for Contact Smart Card Interface.
- ISO 14443 Parts 1-4 Compliant for Contactless Smart Card Interface.
- A built-in antenna for PICC contactless access applications.
- The ACR1251U supports the following Tag Types:
 - MIFARE Classic. E.g. MIFARE 1K, 4K, MINI and Ultralight.
 - ISO14443-4 Type A and B.
 - FELICA、TOPAZ.
- T=CL emulation for MIFare 1K/4K PICCs. Multi-Blocks Transfer Mode is provided for efficient PICC access.
- High Speed (424 kbps) Communication for PICCs. #Maximum 848 kbps.
- User-Controllable Peripherals. E.g. LED, Buzzer.
- Microsoft CCID Compliant for SAM interfaces.
- PCSC Compliant for Contact Interfaces.
- USB V2.0 Interface. (12M bps)
- Device Firmware Upgradeable through the USB Interface.

3.0. Architecture

AT90SCR is for main processor for communication with PC, and control the contactless chip, communication with SAM card and peripherals. PN512 act as a contactless chip to perform the communication between contactless tags and AT90SCR



For communication architecture, the protocol between ACR1251U and PC is using CCID protocol. The communication between SAM is PCSC Compliant



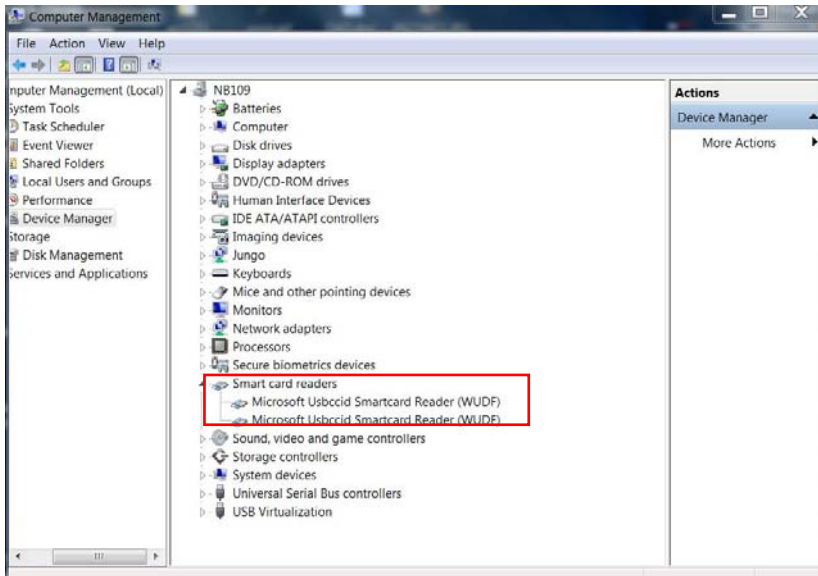


4.0. Connection with computer

- 4.1. plug the ACR1251U-A to a computer USB port, and the red light will be flashing



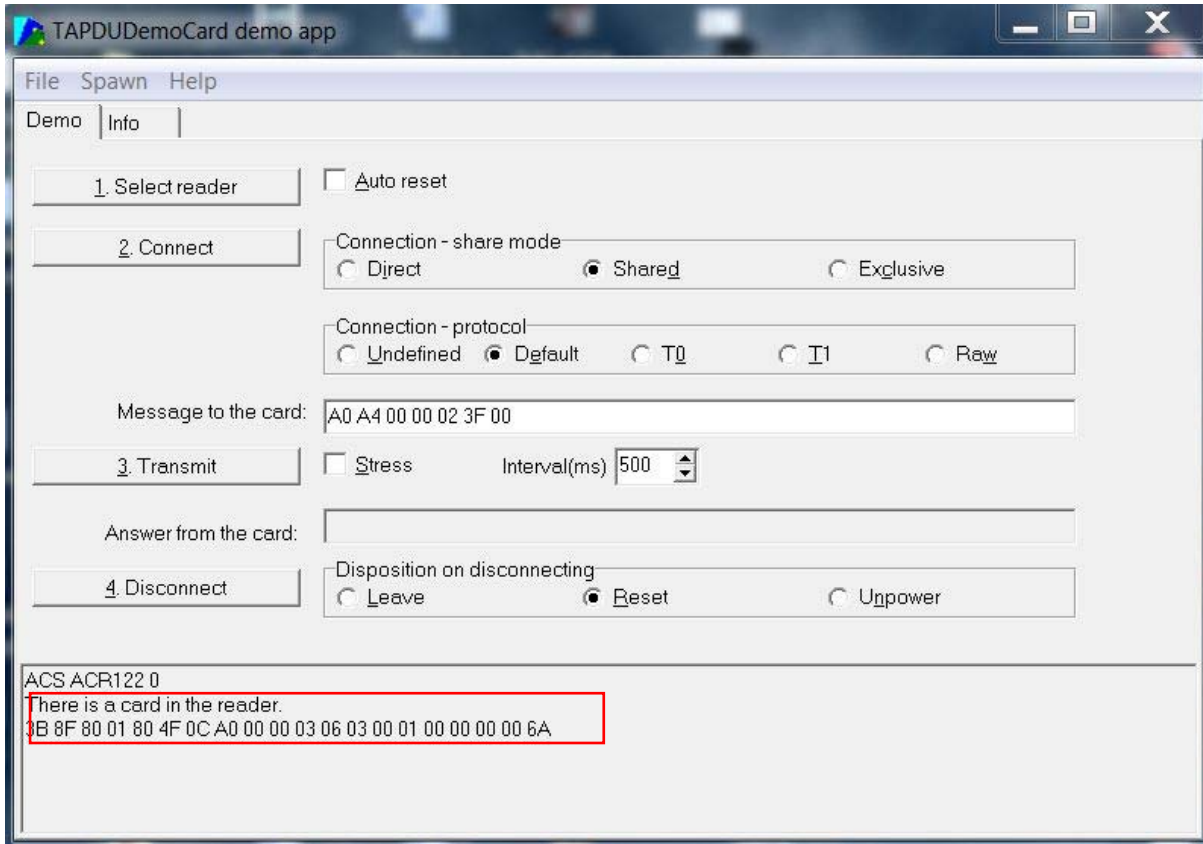
4.2. the driver will be auto install after plugging the reader. You should see the red box below



4.3. When you put a contactless card on the reader, the green LED will be on.



4.4. The card ID can be checked by some card tool software, e.g. APDU.exe, the card ID is shown in the red box below





Appendix A. Parameter sheet

Device

ACR1251U Smart Card Reader/Writer

Power supply

Supply voltage..... Regulated 5V DC
Supply current..... <200mA (without smart card)

Universal Serial Bus Interface

Type USB, four lines: +5V, GND, D+ and D-
Connector supplied together with the reader
Speed..... Full Speed Device, 12 Mbps

Contact Smart Card Interface

Standard ISO 7816 1/2/3, T=0 and T=1
Supply current..... max. 50mA
Smart card voltage 5V / 3V / 1.8V
Smart card read / write speed 9600 – 344kbps
Short circuit protection +5V / GND on all pins
CLK frequency 4.8 MHz
Card connector..... SIM Connector

Contactless Smart Card Interface

Standard..... ISO 14443 A & B Parts 1-4, ISO18092
Protocol ISO14443 T=CL for ISO14443-4 compliant cards and T=CL Emulation for MIFARE 1K/4K, ISO 18092 FelCa and NFC tag
Smart card read / write speed..... 106 kbps, 212 kbps, 424 kbps and 848 kbps

Operating Frequency for Contactless Cards Access

Operating Frequency 13.56 MHz

Antenna

Antenna Size..... 65mm x 60mm
Operating distance..... up to 50 mm (Depend on Card Type)

Built-in peripherals

Monotone buzzer
Dual-Color LED

Case

Dimensions 98 mm (L) x 65 mm (W) x 12.8 mm (H)
Color White Blue

Operating Conditions

Temperature 0 - 50° C
Humidity 10% - 80%

Cable Connector

Length 1.5m (USB)



Standard/Certifications

CE, FCC

EN300330

EN55022 & EN55024

EN55014

OS

Windows 98, ME, 2K, XP, 7

OEM

OEM-Logo





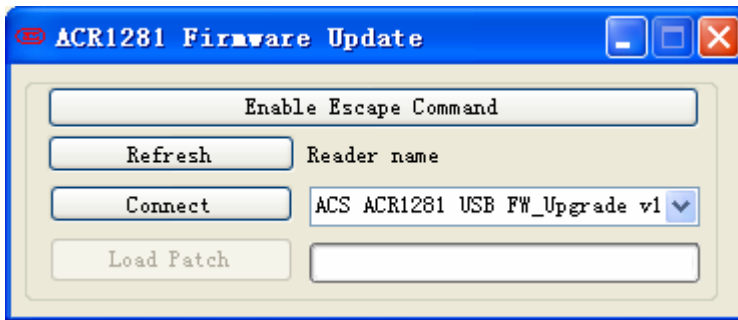
Appendix B. Firmware Upgrade Procedure

Method 1: Upgrade by “FW” Key

- Step 1: Unplug the Reader
- Step 2: Open Casing
- Step 3: Press the “FW, and Hold it
- Step 4: Plug the Reader into PC’s USB Port
- Step 5: Release the “FW” key
- Step 6: Run Firmware Upgrade Application for Firmware Upgrade

Method 2: Upgrade by APDU command

- Step 1: Plug the Reader into PC’s USB Port
- Step 2: Run Firmware Upgrade Application for Firmware Upgrade



Step 3: Select the Reader Name and Connect, then Press “Load Patch” For firmware upgrade.



Warning:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.