



Advanced Card Systems Ltd.
Card & Reader Technologies

ACR89

Portable Smart card Reader

User Manual

Version 0.00.01

Document Name:
03-USR-ACR89





Version History

Date	By	Changes	Version
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1.0. Introduction

As smart card technology becomes widely accepted in the market, integration of different components such as keypad and fingerprint scanner becomes necessary. This allow for an optimization of security and offers convenience sought after in many applications.

ACR89 is an electronic device designed primarily to operate under low energy consumption. It comes with a built-in keypad, LCD, rechargeable battery and large programmable memory features, which allow ACR89 to perform secure transaction between the user and the card both in PC-linked and stand-alone modes. ACR89 is a powerful tool that offers a low-power and high performance solution.

It also supports Secure PIN Entry (SPE). We can securely input the sensitive data through the PIN pad of the device to the PC terminal. This successfully eliminates the possibility of a Virus/Trojan or USB Sniffer getting hold of the PIN, as PIN codes are never exposed to the vulnerable PC or workstation.

Furthermore, ACR89 introduces user firmware upgrade via USB: users are allowed to upgrade the firmware, which can be easily loaded to the ACR89 platform through the USB. This capability makes ACR89 very accessible and ideal for many applications.

This document will guide the user on proper connection of the device and how to install the reader driver.





2.0. Specifications

- 32-Bit RISC Processor running Embedded FreeRTOS
- Dual Operation Modes (PC-Linked/Standalone)
- 2 Full-Size Contact Card Slots
- 3 SAM-Size Card Slots
- Easy-to-Read, High Resolution Backlit LCD
- Highly Durable Chemical Resistant Keypad
- 4 LED Status Indicators
- Monotone buzzer
- Hand-held size and light weight
- Tamper Detection Switch to Protect Against Unauthorized Intrusion
- Real-Time Clock (RTC) with Independent Backup Battery
- Supports Secure PIN Entry (SPE)
- User Programmable by C
- Firmware Upgradeable by USB
- Supports PPS (Protocol And Parameters Selection) with 115,200 – 344,086 Bps In Reading and Writing Smart Cards
- (Optional) Contactless *OR* Fingerprint version
- (On Request) Detachable Printer Cradle

- Supported Card Types
 - MCU card
 - T=0 or T=1 protocol
 - ISO 7816 Compliant Class A,B,C (5V, 3V, 1.8V)
 - Memory-based Smart Cards
 - I2C bus protocol (free memory cards)
 - SLE4432/5542 intelligent 256 bytes EEPROM with write protect function
 - SLE4418/5528 intelligent 1K bytes EEPROM with write protect with function
 - (Optional) Contactless cards
 - ISO 14443 Compliant Type A & B standard, part 1 to 4
 - T=CL protocol
 - Mifare classics
 - Felica cards

- Certification / Compliance
 - PC/SC
 - USB Full Speed
 - CE
 - FCC
 - EMV Level 1
 - RoHS
 - Microsoft® WHQL



3.0. Scope and Limitations

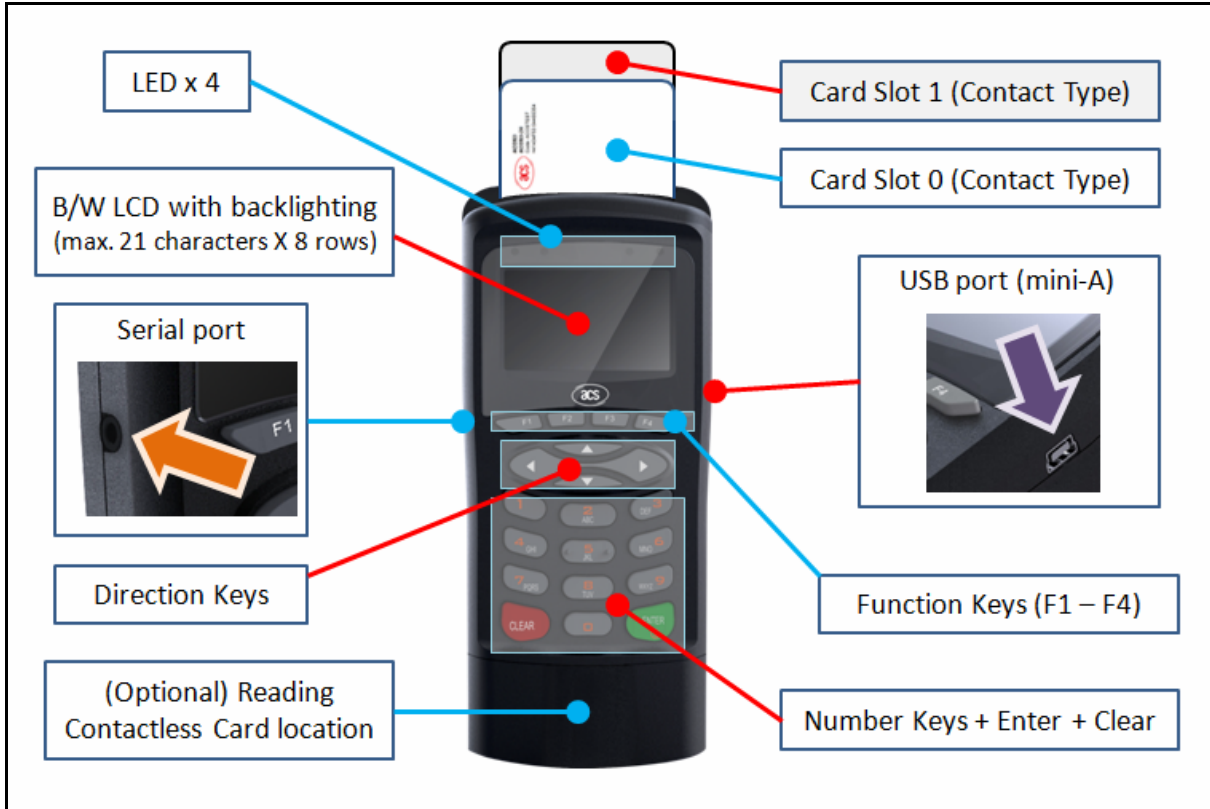
The ACR89 allows working in two modes, stand-alone mode and PC-linked mode. It is embedded with Real Time OS to allow stand-alone operations and it also allows the device to be operated by a computer (running on Windows, Mac and Linux OS) connecting through an USB cable.

When used as a stand-alone terminal, the ACR89 device is fully functional with the Pin-Pad for user input and the LCD screen for display output. The device can be accessed or programmed through a computer (running on Windows, Mac and Linux OS) using USB communication protocol.

4.0. Illustration

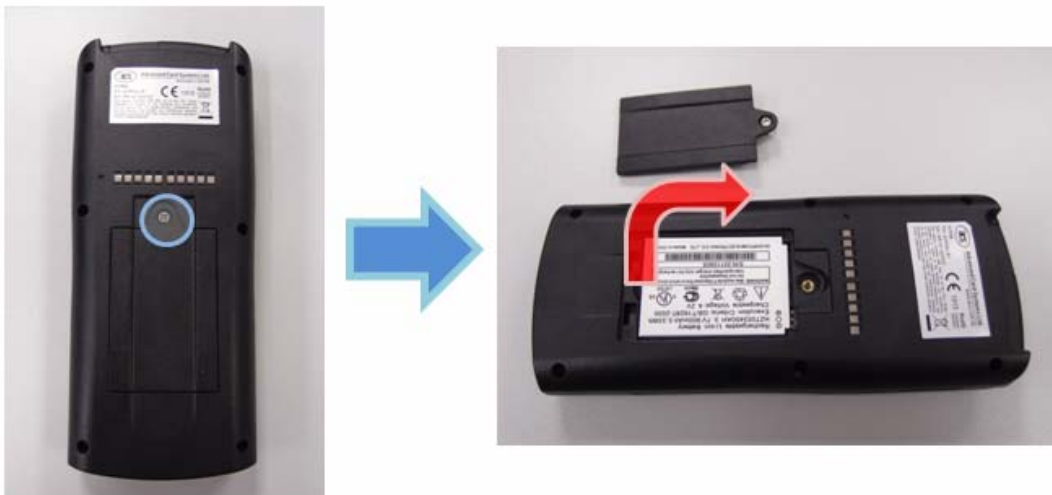
4.1. ACR89 device and parts

The main components of ACR89 are shown below:



4.2. Battery

ACR89 runs on a rechargeable Li-ion battery (3.7V, 900mAh, 3.33Wh). It locates at back of the device. In order to change a battery, turn the screw in the circle to the left figure below to left to remove the battery cover. Follow the direction of the red arrow to take out the battery.



4.3. SAM card slots

There are 3 SAM card slots on ACR89. They are located in the bottom part of the device. In order to insert or change SAM cards, please follow some simple steps below.

1. Turn the two screws on the back bottom part of the device to the left
2. Slide down the cover on front bottom of the device and the SAM card slots will be seen



5.0. ACR89 Driver Installation

5.1. Device Driver Download Location

The device drivers of the ACR89U Handheld Smart Card Reader are available in the following locations:

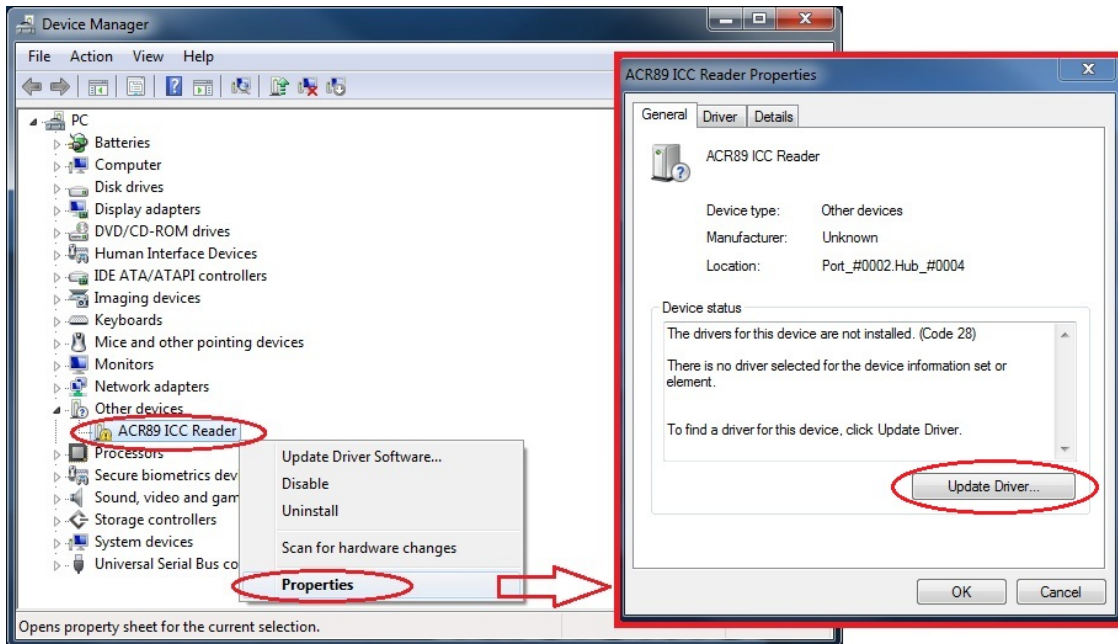
- ACS Driver Download Webpage (<http://acs.com.hk/index.php?pid=drivers>)
- Windows Update for Windows XP and 2000

It is strongly recommended that the user installs/uninstalls the driver using the device driver installer.

5.2. Windows Driver Installation

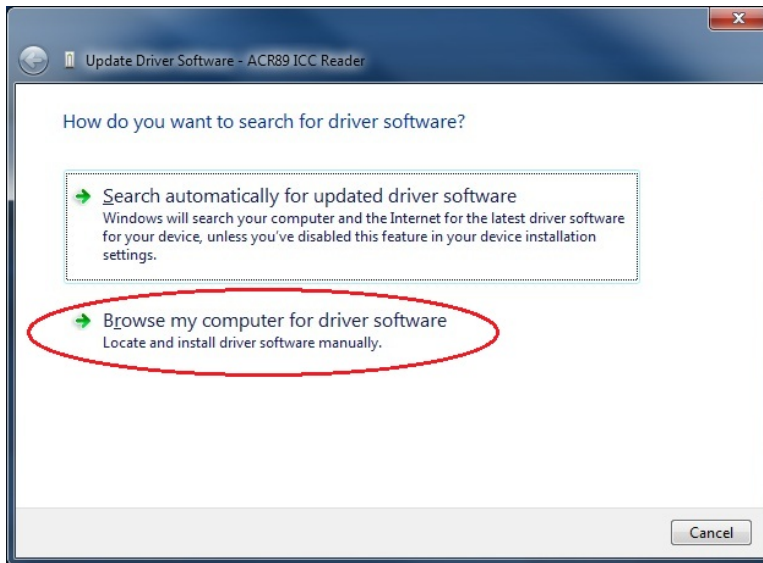
Please following the steps below to install the Driver for ACR89

1. Unzip the Reader Driver rar file
2. Plug the ACR89 to your PC with USB cable
3. Go to “Control Panel”, select “Device Manager”
4. Expand “Other devices” and “ACR89 ICC Reader” would be shown

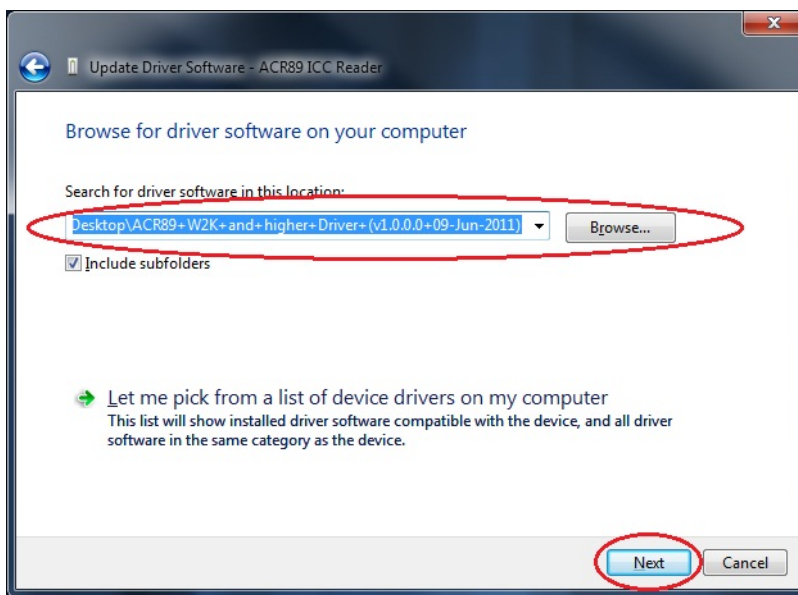


5. Right click “ACR89 ICC Reader” and select “Properties”

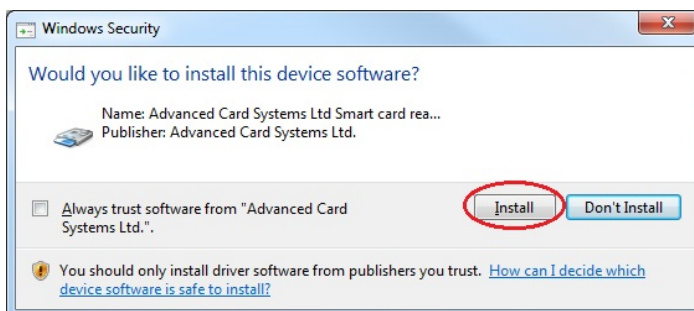
6. Click “Update Driver...”
7. Select “Browse my computer for driver software”



8. Browse the location of the driver folder and click “Next”

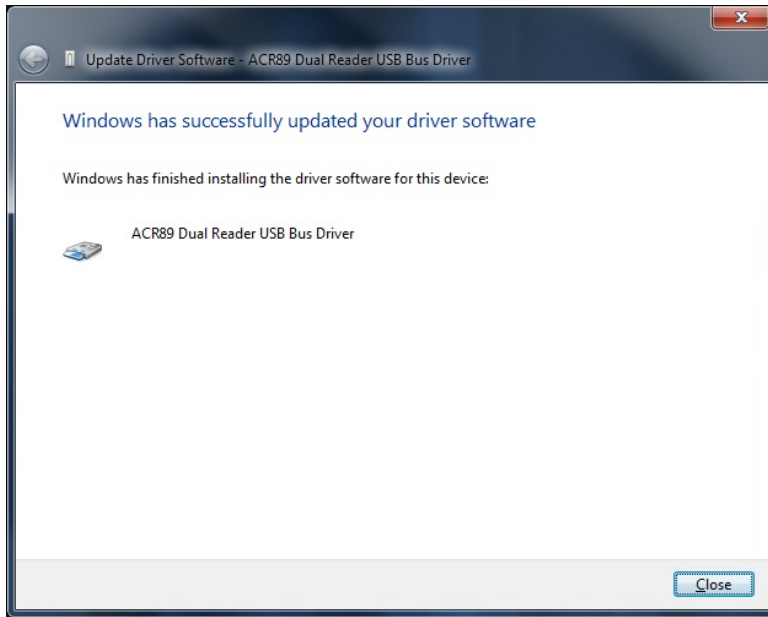


9. Click “Install” for Windows Security





10. The below message will show after install successfully

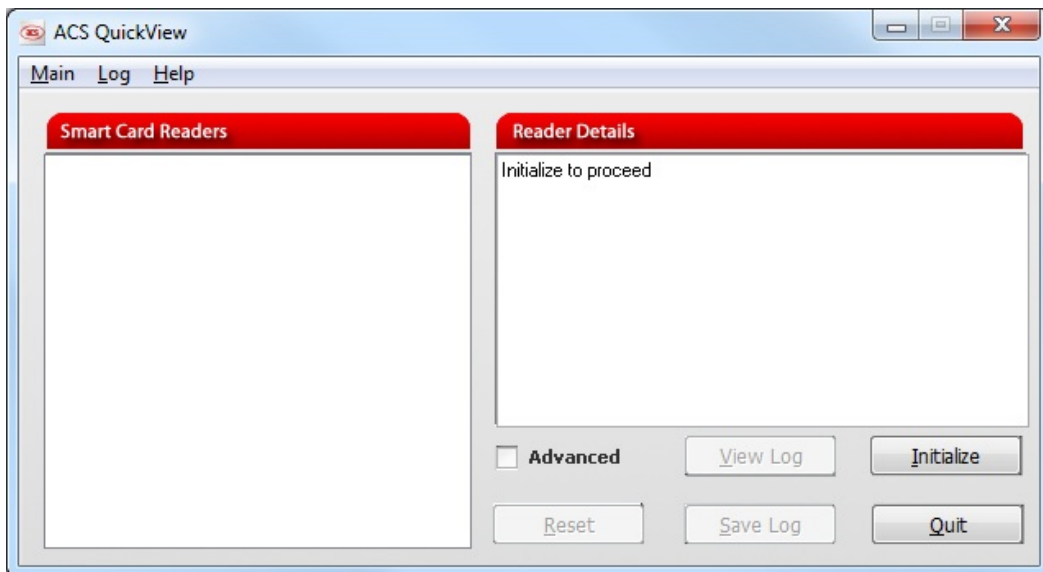


5.3. Checking the Installation

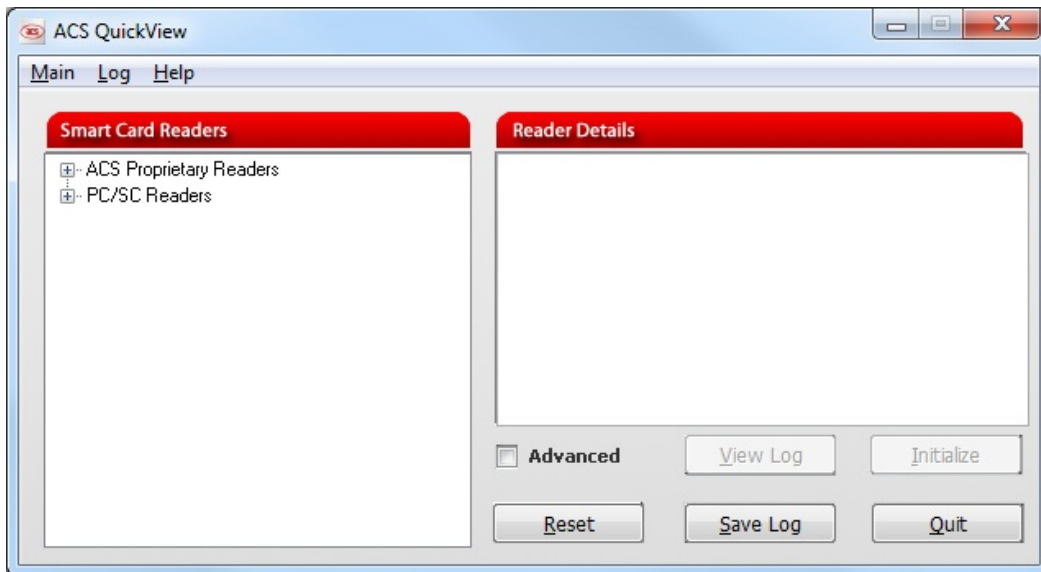
To check if the ACR89U Handheld Smart Card Reader driver was installed properly, check the ACS Diagnostic Tool – QuickView – or the Device Manager in Microsoft Windows.

5.3.1 Using QuickView

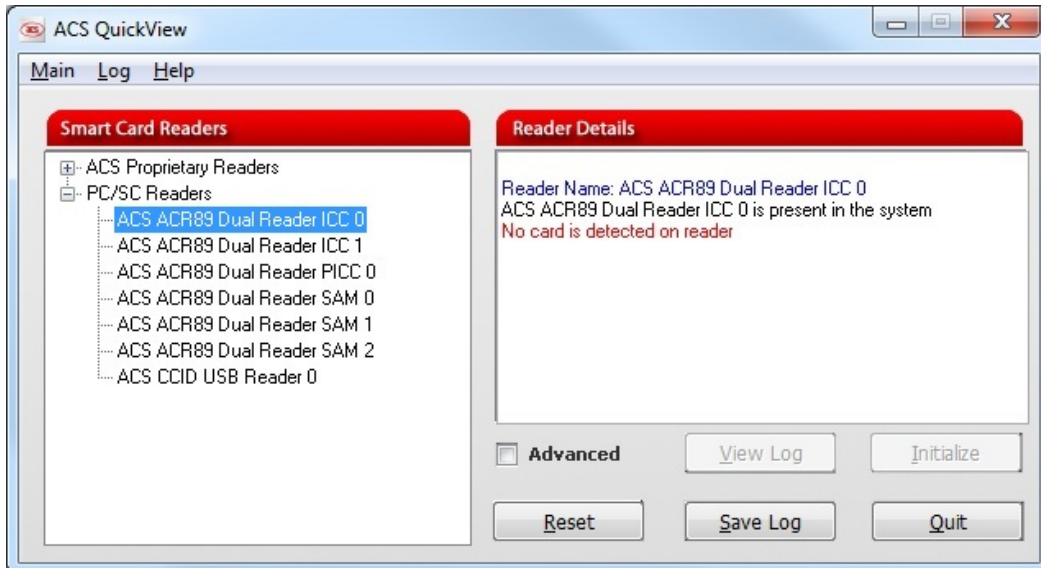
1. Connect the ACR89U Handheld Smart Card Reader to the PC. Run Quickview.exe then click Initialize to start the driver diagnosis.



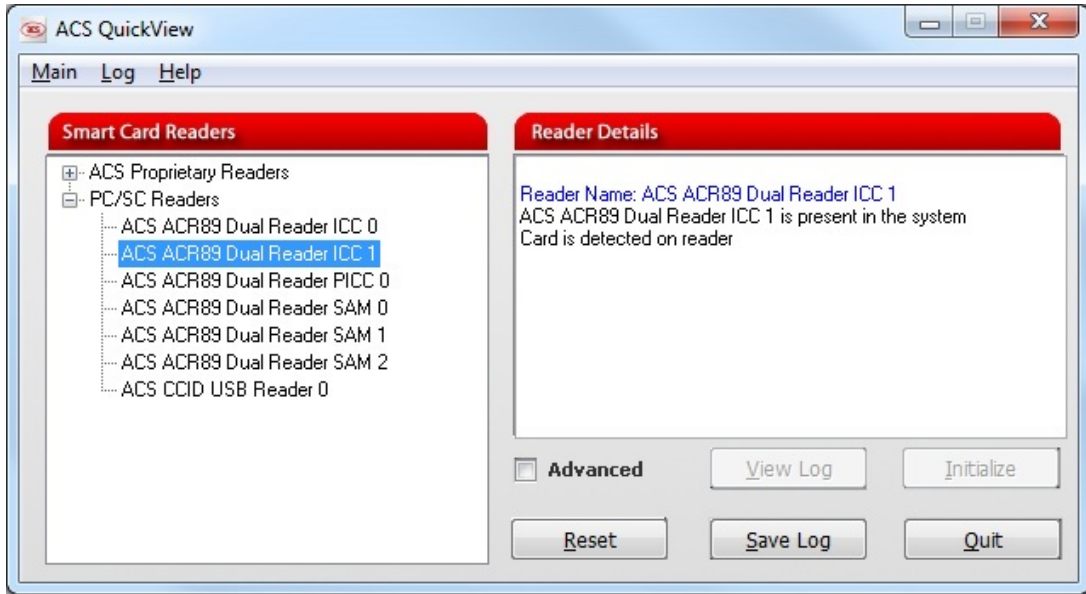
2. After initialization, the interface shows like below. Expand the PS/SC Reader.



3. If the ACR89U Smart Card Reader was successfully installed in the PC, the reader details will be displayed. Click a particular card slot, the “Reader Details” in the program shows if the slot detects a card.



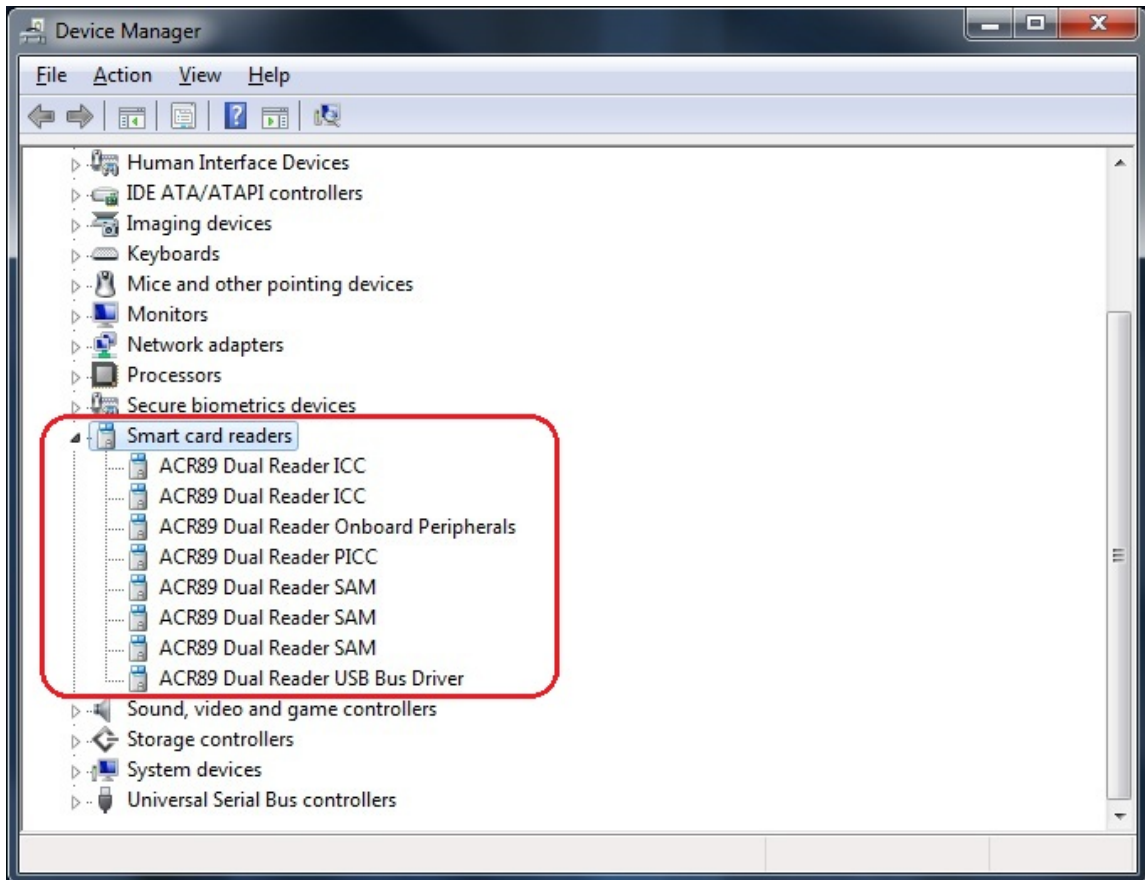
In this example, there is no card inserted in the slot ICC 0, so it shows “No card is detected on reader”.



There is a card inserted in the slot ICC 1, so it shows “Card is detected on reader”.

5.3.2 Using Device Manager

To start the Device Manager, select Start → Settings → Control Panel and then double click on the System, then click the Device Manager.





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.