



ACR30

User Manual



ACR30 smart card reader/writer

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1. Introduction



ACR30 Smart card reader/writer

The ACS Smart Card Reader/Writer ACR30 is an interface for the communication between a computer (for example, a PC) and a smart card. Different types of smart cards have different commands and different communication protocols. This prevents in most cases the direct communication between a smart card and a computer. The ACR30 Reader/Writer establishes a uniform interface from the computer to the smart card for a wide variety of cards. By taking care of the card specific particulars, it releases the computer software programmer of getting involved with the technical details of the smart card operation, which are in many cases not relevant for the implementation of a smart card system.

The ACR30 Smart Card Reader/Writer is connected to the computer through a serial asynchronous interface (RS-232) or USB interface. The reader accepts commands from the computer, carries out the specified function at the smart card and returns the requested data or status information.

The ACR30 is a compact, very cost-effective, single chip reader which supports all MCU-based cards with T=0 or T=1 protocols as well as the popular memory cards in the market today. It is ISO 7816-1/2/3 compliant, EMV and Microsoft PC/SC certified, and supports all major PC platforms.

Being a single-chip solution, this reader is one of the most cost-effective solutions for e-commerce, information security, access control, identification, and other smart card applications. It is available in two types of interface: **ACR30S** and **ACR30U**. The **ACR30** is also available in two types of casing, the original Piano casing and the new CyberFrog casing.

Like the **ACR20**, the **ACR30** is also supplied in module form (ACM30). This is an ideal solution for easily integrating smart card access into any application. The module retains the

full functionalities of the reader/writer, and can be easily integrated in payphones, parking meters, vending machines, laundries, gaming machines, ATM's, sophisticated access control systems, and more.

2. Technical specifications and system requirement

Standard features for the ACR30 reader series:	
<ul style="list-style-type: none"> • ISO 7816-1/2/3 and PC/SC Compliant • Certified by CE, FCC, EMV and Microsoft WHQL • Read and write ALL microcontroller cards with T=0 and T=1 protocols • Read and write the popular memory card types in the market: <ul style="list-style-type: none"> ○ Siemens: SLE4406, SLE4418, SLE4428, SLE4432, SLE4442 ○ Atmel: AT88SC06, AT24C01-16 ○ STMicroelectronics: ST1305, ST14C02C, ST14C04C <p>Note: Card manufacturers using the above-mentioned chips may have different names for their cards. These cards are likewise supported by ACR30. Examples are:</p> <ul style="list-style-type: none"> - Gemplus: GPM103, GFM2K, GFM4K, GPM2K, GPM8K - Schlumberger: Primeflex Store 2K/8K, Open 2K/4 <ul style="list-style-type: none"> • Interface library for efficient PC application software development <ul style="list-style-type: none"> ○ 32-bit DLL files for Windows 95, 98, Me, NT and 2000 ○ PC/SC compliant IFD handler 	
Technical Specifications:	
Interface	RS-232 (Serial) or USB
Supply Voltage	Regulated 5V DC
Supply Current	<100mA (without smart card)
Operating Temperature	0 - 50 °C
CLK Frequency	3.68 / 4 MHz
Standards / Certifications	ISO 7816-1/2/3, PC/SC, CE, FCC
Operating System Support	Windows 95, 98, Me, NT, 2000 and XP, Linux

3. Smart card reader installation/uninstallation by using installer

3.1 Installation - Example : ACR30U, PCSC, Win2K



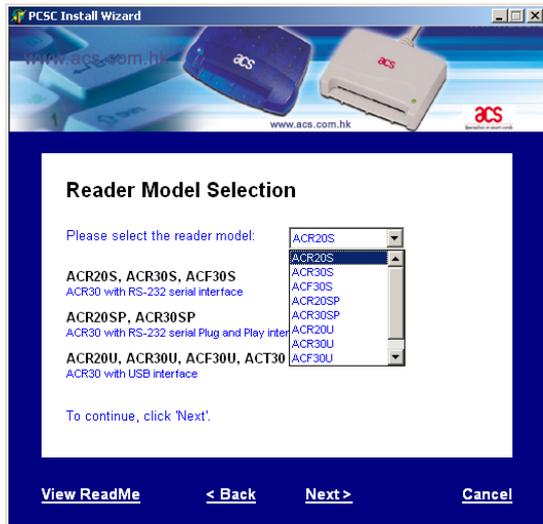
a)

After the user run "setup.exe" which is located in the "AC-Kit driver directory". This page will be shown.

Click "**Next**" button

Note:

1) Please do NOT connect the ACR30 reader with PC until the instruction by installer.

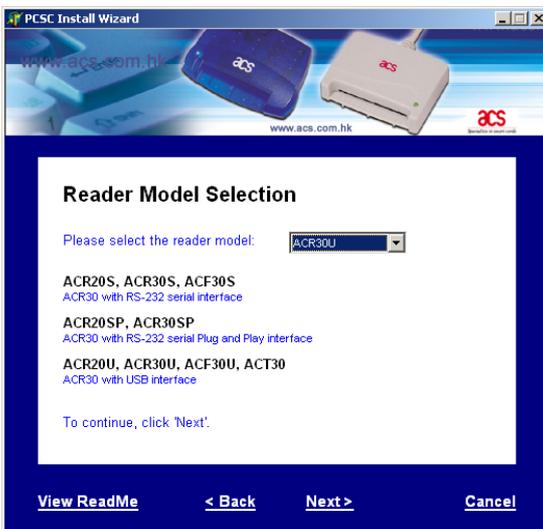


b)

The user should select the appropriate smart card reader from the list.

Note

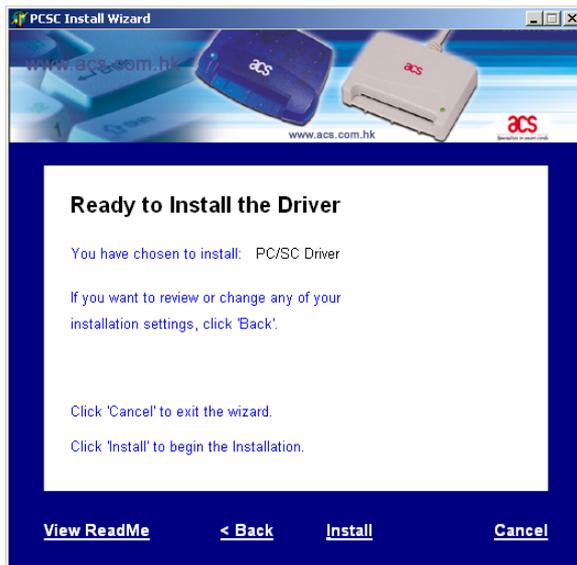
U – USB
SP- Serial Pnp
S – Serial RS-232



c)

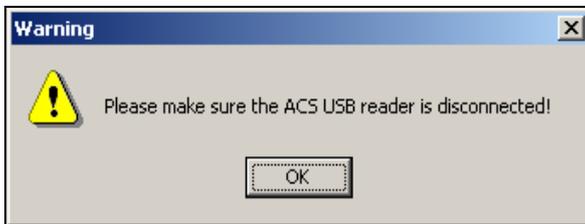
For example, ACR30U is selected.

Click "**Next**" button



d)
Click **“Next”** button

Note:
1) Please do NOT connect the ACR30 reader with PC until the instruction by installer.
2) For the ACS30S (PCSC), the user will be asked to select their COM port.



e)
Please make sure the ACS USB reader is disconnected.

Click **“OK”** button



f)
Please connect the reader.

Click **“Yes”** button for the Digital signature dialog box.



Click **“OK”** button

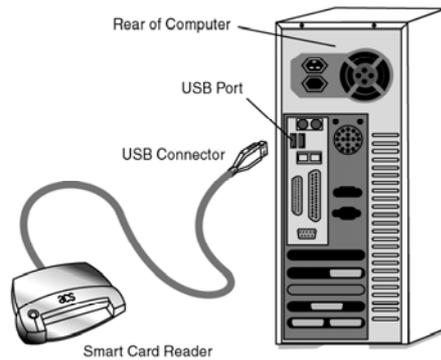


- g) Click **“Finish”** button

Note

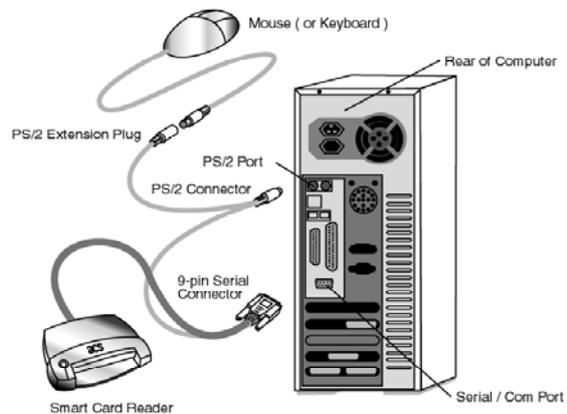
- 1) The user may be asked for reboot the system under Win 98, Win Me platforms.
- 2) To ensure the PCSC driver is installed properly, the LED will be turn on when the card is inserted.

3.2. Connection Diagrams



Connection diagram of USB Interface Smart Card Reader

Connection diagram of RS-232 Serial Interface Smart Card Reader



3.3. Un-installation (Example : ACR30U, PCSC, Win2K)



a)

For the un-installation, the user just need to run the installer again.

After the user run "setup.exe" which is located in the "AC-Kit driver directory". This page will be shown.

Click "**Next**" button



b)

The installer can detect your existing driver.

Click "**Next**" button to remove the driver



c)

Re-boot the system to make sure the driver can be removed successfully.

Click "**Next**" button to re-boot

4. Sample Applications (available from www.acs.com.hk)

All the sample applications are developed for ACOS1 MCU card only.

Note: You will need to install the ACS Proprietary drivers for these applications.

4.1 ATM Demo

4.1.1 Program Description

This application demonstrates the use of ACOS card as a combo ID and stored-value card with a built-in PIN-protected security access layer. The program provides a simulated Online Bank module and a simulated E-Shop module. In both cases, the smart card can be used to transact business using ACS smart card readers.

In the banking application, the smart card can be used to transfer money from the simulated bank module to the card. In addition to this functionality, the money can also be withdrawn from the value stored on the smart card. In the e-shop application, the smart card can be used to purchase items from the simulated store module. The total value of purchase shall be checked against the value stored on the card and the transaction can be consummated if the value stored on the card is enough to cover for the total value of purchases made.

The application also provides the functionality to format the smart card for the use of the application. During this stage, the smart card shall store basic information of the cardholder, and the cardholder's PIN. The card money value is stored in the special account module present only in ACOS smart cards. The PIN shall be used as a security access for all processes that involve the amount of money stored on the smart card.

The program also displays a window that shows the various APDU commands and responses that occur for the whole duration of program execution.

4.1.2 Platform and driver

Suggested Operating System	Driver
Windows 98 SE	ACS Proprietary Driver
Windows ME	
Windows 2000 Professional	

4.1.3 Installation

The demonstration program is provided herein as an executable file. The user needs to install the ACS smart card reader using the ACS Proprietary driver before running the program. The user is also required to copy the file, Des.dll, into either the System directory or the directory where the demonstration program resides.

4.1.4 Function Keys and Processes

When the program is run, the user will be prompted into the Main Menu window as shown below.

The user is required to select the Port to which the ACS smart card reader is connected. The Output window on the right half of the screen will display the APDU command and responses for the various processes that may be invoked for the duration of the program execution.

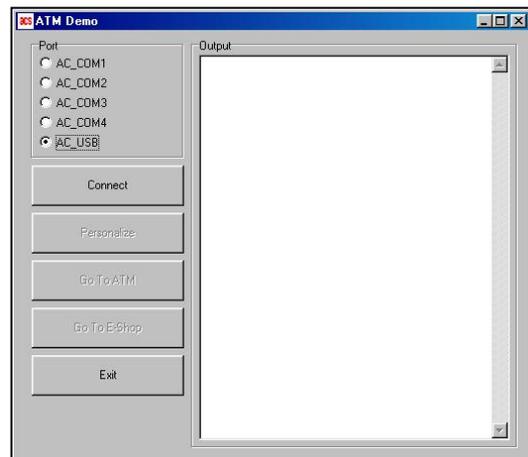
Connect – When the proper port is selected, enables the rest of the Function buttons

Exit – Terminates the demonstration program

Personalize – Displays the Card Personalization window as shown below (Input boxes with red label are required data)

Personalize Card – Formats the smart card and writes the information provided by the user into the card

Reset Form – Erases contents of all input boxes in the window



Go To ATM – Enables the simulated Online Bank module as shown below

The smart card reader is on Wait status at this point. When a smart card is inserted, Online Bank menus will be enabled and the user can interact with the module using the function keys available.



Go To E-Shop – Enables the simulated E-Shop module as shown below

The user can drag the items into the window provided for items to be bought. The smart card is required to be inserted when the user will opt for the Buy and Inquire functions.

Buy – Checks the value stored in the smart card and consummates sale if money value on card is sufficient



Inquire – Displays the amount of money currently stored in the card

4.1.5 Libraries

Acsr2032.dll and Des.dll

4.1.6 Balance reader

After the user stores the personal information and money amount in the ACOS1 card, he/she can view the personal information and the total amount by using balance reader.

4.2 Screen Saver

4.2.1 Program Description

This application installs and registers a Screensaver module into the Windows operating system. This module operates using both the ACOS smart card and the ACS smart card reader. When the application is active, the system only refreshes from the Screensaver mode if the correct smart card is inserted into the reader.

The specific card information required to deactivate the Screensaver is obtained by the program during installation. In this respect, only the specific smart card used in the installation can be used to deactivate the Windows Screensaver program.

4.2.2 Platform and driver

Suggested Operating System	Driver
Windows 98 SE	ACS Proprietary Driver
Windows ME	
Windows 2K	

4.2.3 Installation

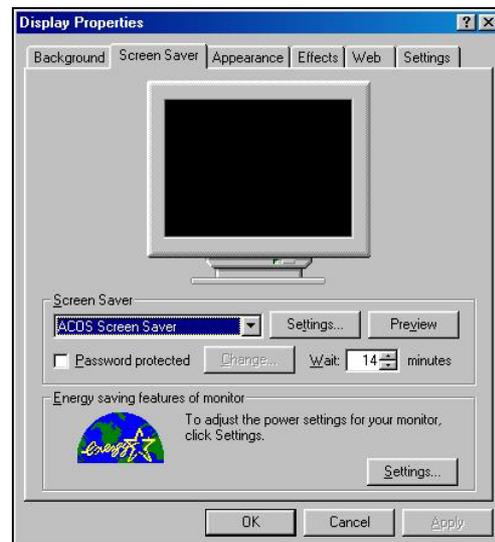
Install ACS Proprietary driver for your reader. Then, right-click on the file, Acos_ss.scr, and choose Install. The user will then be prompted into the Windows Screensaver window as shown below

Step 1 : Insert the ACOS1 card

Step 2 : Right click the "ACS" icon to configure the connection interface

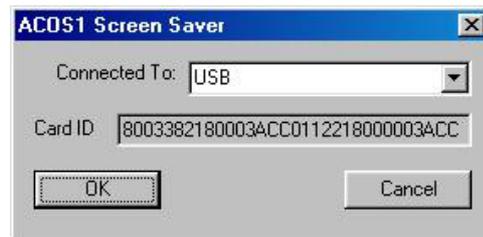
Step 3 : Right click the "ACS" icon to install the program

The user needs to click on the Settings button to setup the smart card reader and the smart card to be used. An ACOS smart card must be inserted into the reader so that the application can read and save the card data it needs.



4.2.4 Function Keys and Processes

To activate the application setting window, the user may either right-click on the program file, Acos_ss.scr, and select Configure or click on the Settings button of the Windows Screensaver window.



OK – Saves application setting as displayed in the window

Cancel – Disregards application setting shown in the window and reverts application settings to previous values

4.2.5 Libraries

Acsr2032.dll and Winscard.dll

4.3 SIMmate 2000

4.3.1 Program Description

No more fumbling with your mobile phone keypad! With SIMmate 2000, you can easily create, edit, and backup phonebook entries and short messages using your PC. Manage your PIN codes, transfer data from one SIM to another, all on your desktop or mobile device.

Please access <http://www.simmate2000.com> to obtain more information about SIMmate 2000.

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