STMicroelectronics

BioSIMKey

User Manual

www.st.com

Responsible Party Name :

STMicroelectronics Ltd.
2001 Center Street Suite 500
Berkeley, CA 94704-1204

Phone: 510-9033226
Fax: 510-6659730

Hereby declares that the product

Product Name: BioSIMKey
Model: TCRA1A8AG1AK1A

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

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.

Shielded cables must be used with this unit to ensure compliance with the Class B FCC limits.

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."

Declaration of Conformity

C E

Party Name :

ST Microelectronics Ltd.
2001 Center Street Suite 500
Berkeley, CA 94704-1204

Phone: 510-9033226
Fax: 510-6659730

Type/Model

Product Name: BioSIMKey
Model: TCRA1A8AG1AK1A

SUMMARY OF RESULTS

This is to verify that the sample of the above item is considered to comply with the requirements of the above standards, pursuant to the EMC Directive 89/336/EEC.

Under the environment with electrostatic charge, the sample may malfunction and require user to reset the sample"

Certificate of Compliance

CANADIAN STANDARDS ASSOCIATION

Canadian Standards Association

Certificate : 1320040   Master Contract : 212447

Edition : 1   Date Issued : May 17, 2002

Issued to : STMicroelectronics, Inc.

2001 Center street, Suite 500
Berkeley, CA 94704-1204
USA

The products listed are eligible to bear the CSA Mark Shown with adjacent indicators "C and "US"

Products
Class 3862 10 – INFORMATION TECHNOLOGY EQUIPMENT (CAN/CAS-C22.2 No. 60950-00, Third Edition)

Class 3862 90 – INFORMATION TECHNOLOGY EQUIPMENT (CSA 60950-00/UL 60950, Third Edition, NRTL Program)

Finger Print Scanner, Model TCRA1Axxxx, rated 5Vdc, 160 mA.

Authorized by :
Terry Nagy
Operations Manager

Notes :

a) This x in the model designations may be any alphanumeric character denoting minor mechanical options, system configuration options and/or software options.
b) Equipment is to be supplied from PC, USB port (SELV Limited Power Source).
c) No Canadian or US requirement and/or tests were waived.

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S./ respectively. This 'US' indicator includes products eligible to bear 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational; Safety and Health Administration (OSHA) to laboratories, which have been recognized to perform certification to U.S. Standards.

Table of Contents

Note :

1) It is NOT necessary for the user to go through section 6 and 7 if the user installs the BioSIMKey by installer.
   Section 6 and 7 are provided for the user who wants to install the driver of BioSIMKey manually.
2) It is strongly recommended that the user installs/uninstalls the driver by using BioSIMKey installer.

1. Item checklist

- ☐ BioSIMKey ADT60 – Fingerprint scanner and plug-in smart card reader
- ☐ 5 x ACOS1 8Kbyte microprocessor-based card
- ☐ 5 x ACOS1 8Kbyte microprocessor-based card in plug-in format
- ☐ ACS BioSIMKey installation and operation CD-ROM
- ☐ 1 plug-in card converter (convert smart card format to plug-in card format)
- ☐ Installation guide

2. Company introduction

STMicroelectronics is a global independent semiconductor company and is a leader in developing and delivering semiconductor solutions across the spectrum of microelectronics applications. An unrivaled combination of silicon and system expertise, manufacturing strength, Intellectual Property (IP) portfolio and strategic partners positions the Company at the forefront of System-on-Chip (SoC) technology and its products play a key role in enabling today's convergence trends.

In 2001, ST's net revenues were US $6.36 billion and net earnings were US $257.1 million. According to Gartner Dataquest's annual ranking for 2001, STMicroelectronics was the third largest semiconductor company in the world. The Company was also ranked third and second, respectively, by industry analysts IC Insights and iSuppli in their final rankings for 2001.

According to the most recent data from independent sources, ST is the world's leading supplier of analog ICs and MPEG-2 decoder ICs, and is ranked number two for non-volatile memories overall and at number four for Flash memory. In application segments ST is number one for ICs for set-top boxes and hard disk drives; at number two for smart cards and DVDs; at number three for automotive ICs; and finally, at number four for telecom ICs.

The Company's products are manufactured and designed using a broad range of fabrication processes and proprietary design methods. To complement this depth and diversity of process and design technology, the Company also possesses a broad intellectual property portfolio that it has used to enter into cross-licensing agreements with many other leading semiconductor manufacturers.

3. BioSIMKey Software and Development Kit (SDK)
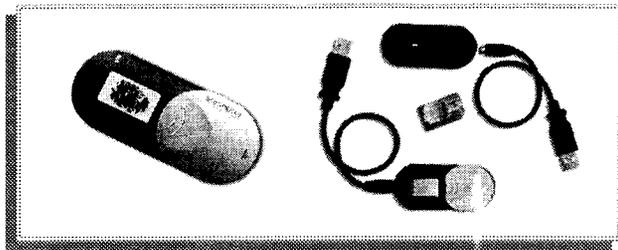
ADT60 BioSIMKey

BioSIMKey SDK provides a convenient way for application developers and embedded system designers to incorporate fingerprint and smart card authentication as part of their solutions. BioSIMKey SDK is a powerful, open operating system for fingerprint & smart cards. It is easy to use, open to anyone, requires no special training, and competitively priced. Anyone can program his or her own application on fingerprint and smart card authentication. All the tools you need to be a serious developer are included in the BioSIMKey SDK. To get your own tool, or to learn more, visit our website @ www.st.com.

BioSIMKey is the first device of its kind to combine a smart card and fingerprint reader in a single device that can be carried in your pocket as any other key. It comprises the highly successful silicon fingerprint sensor and a plug-in card reader for ultra-secure authentication. The multi-factor authentication approach of the reader - verifying "something you have" as well as "something you are" - provides a secure and convenient solution for authenticating the true identity of a person.

Since fingerprints cannot be lost, duplicated, stolen or forgotten, the product range is widely regarded as providing a more reliable and convenient solution than traditional security devices. With the BioSIMKey, security is improved further by storing the fingerprint templates inside a plug-in card instead of the PC. This not only provides a more secure environment but it also enhances portability and eliminates privacy concerns. What is more, it gives users the flexibility of being able to carry their fingerprint template with them, safe in the knowledge that no-one else can use their smart card should it become lost or stolen.

As a proven solution for biometrics, the BioSIMKey is an ideal solution for a broad range of applications including e-business, network access, home banking, secure e-mail, file encryption, and government security

Using a simple Application Programming Interface, it is extremely easy for designers to integrate the fingerprint authentication features into their applications. The developer can develop the interface very quickly without an in-depth knowledge of biometrics.

Features
- ❏ Smallest integrated fingerprint scanner/smart card reader in the market today
- ❏ High-speed USB interface
- ❏ Requiring no additional power supply
- ❏ Portable and easily transferable from one PC to another

Fingerprint Scanner
- ❏ High-resolution 508 DPI imaging
- ❏ Utilizes ST's patented TouchChip technology, resulting in high quality fingerprint images in any environment

Smart Card Reader
- ❏ ISO 7816-3 and PC/SC compliant
- ❏ Supports all micro-controller cards, with T=0 or T=1 protocols

Security Features Possible
- ❏ Encrypted finger print template stored inside smart card
- ❏ Session key generation among smart card, BioSIMKey Processor and host computer
- ❏ Unique bonding between the smart card and BioSIMkey

Typical Applications
- ❏ Remote Electronic Voting
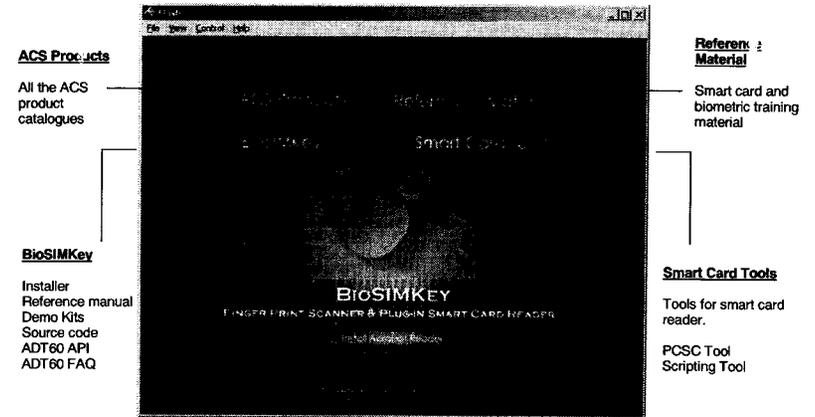- ❏ Secured E-commerce
- ❏ Secure Home-banking
- ❏ Computer System Logon

4. Technical specifications and system requirement

Specifications:	
Physical Dimensions	71.5x32x16.5 mm
Supply Voltage	Regulated 5V DC
Supply Current	< 100mA (without smart card)
Operating Temperature	0 - 50 °C
Standards / Certifications	ISO 7816-3, CE, FC ;, PC/SC
Operating System Support	Windows 98, Me, 2( )0, and XP
System Requirements:	

- IBM-Compatible Personal Computer with Intel 486 Processor or higher

- Microsoft Windows 98/Me/2000/XP

- Minimum 16MB RAM

- Available USB port

5. Installation of BioSIMKey by using installer (For both Win98 and Win2K)

5.1 BioSIMKey installation procedures

Please insert the provided ACS BioSIMKey Operation and Installation CD-ROM. The BioSIMKey SDK main menu will be shown as following:

ACS Products

All the ACS product catalogues

BioSIMKey

Installer
Reference manual
Demo Kits
Source code
ADT60 API
ADT60 FAQ

Referen :
Material

Smart card and biometric training material

Smart Card Tools

Tools for smart card reader.

PCSC Tool
Scripting Tool

BioSIMKey CD-Rom Meun

There are four items in the index menu page. They are "ACS products", "BioSIMKey", "Reference material" and Smart card tool". The user can install the BioSIMKey device automatically by a simple click of the "BioSIMKey" button and selecting the "BioSIMKey installer". The installation program will guide the user to complete the whole installation process.

In fact, the user also can view all the components in the SDK CD-ROM such as ADT60 API, ADT60 reference manual, smart card tools and biometric reference material. For this part, the installation process will be shown in detail. The following table shows the components for each items.

Notes :
1) The user can select the installer or driver to install the necessary driver for BioSIMKey.

2) For using installer user, please do not connect the BioSIMKey until the instruction from installer
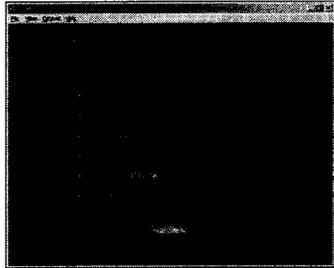
ACS Products

All the ACS products catalogue:

1) Smart card reader
2) Palm reader
3) SIMmate 2000
4) Floppy casing reader
5) Smart card terminal
6) Balance reader
7) Chip set
8) AC-IR
9) Dual interface reader
etc.
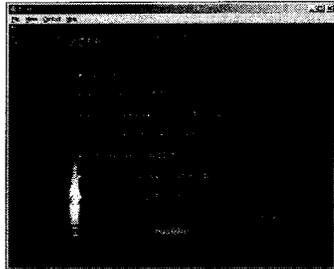
BioSIMKey

1) Installer
2) Reference manual
3) Demo Kits
4) Source code
5) ABT60 API
6) ABT60 FAQ
7) User manual
8) Manual for demo kits
etc...

Reference Material

Smart card and biometric training material such as:

1) What is a smart card
2) Type of memory cards
3) 256 memory card
4) PCSC workgroup
5) Electronic purse application
6) BIOAPI
etc.

Smart card tool

Tools for smart card reader.

1) PCSC Tool
2) Scripting Tool
3) PCSC modules
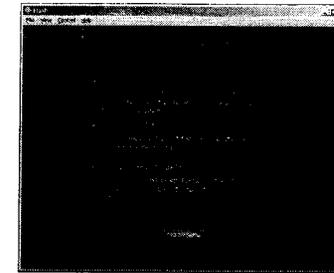
a) Both Win 98 & Win2K

After the user click the "BioSIMKey installer" button. This page will be shown.

Click "**Next**" button

Note:
Please do NOT connect the BioSIMKey with PC until the instruction by installer.
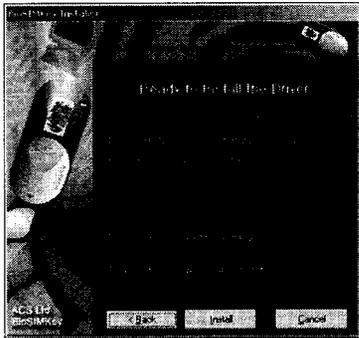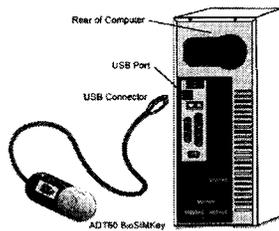

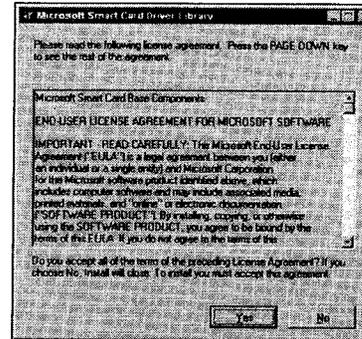
b) Both Win 98 & Win2K

Click "**Install**" button
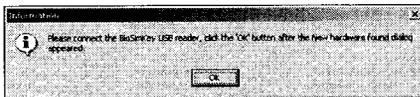
c)
Then, the BioSIMKey should be connected in this stage.

Please follow the connection diagram to ensure that the BioSIMKey can be connected with PC properly.
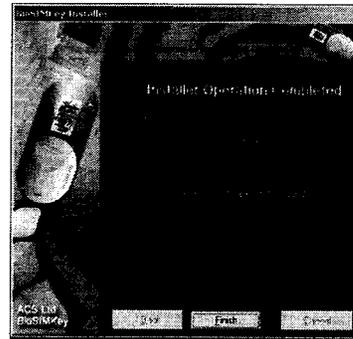
Click "**OK**" button

Rear of Computer

USB Port

USB Connector

ADT60 BioSIMKey

Connection diagram of BioSIMKey

d)
For Win 98 users :

The installer will automatically install the Microsoft Smart Card Base components.

For Windows 2K users :

This step will not shown for the Win 2K user because the PC/SC components are already included inside the system.

Click " **Yes**" button

e) Both Win 98 & Win2K

Installer operation is completed.

Click "**Finish**" button

Note
For Win 98 user, it is necessary to reboot the system to complete the installation process.

Notes

1) For Win 98 platform, the system may ask for installing the USB composite device. The user can follow the steps (a) to (e) from section 6.3 to complete the whole installation process.

2) Windows will look in system files for TouchChip driver (USBSCAN.SYS) during the installation process. If it is not found, Windows will prompt for the user to insert Windows Installation disks. The TouchChip sensor driver is in fact a windows system. It is normally distributed with Windows 98. This file should be located in:

\Windows\system32\drivers\   (Win 98)

\WINNT\system32\drivers\   (Win 2000)

5.2   BioSIMKey Un-installation procedures

The driver can be un-installed by running the installer again.

a) Both Win 98 & Win2K
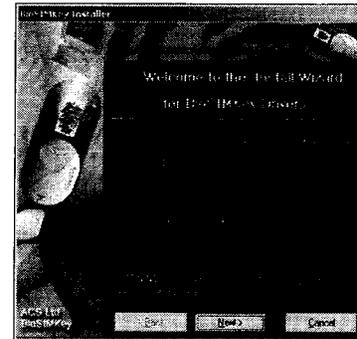
Click "**Next**" button

b) Both Win 98 & Win2K

The installer will detect the existing driver automatically.

Then, Click "**Next**" button to uninstall the driver.

The system should be re-started to ensure the BioSimKey driver can be removed properly.
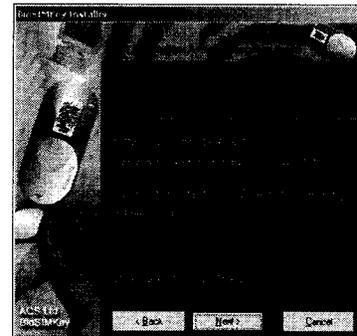
Notes

1) It is strongly recommended that the user installs/uninstalls the driver by using BioSIMKey installer.

2) It is **NOT** necessary for the user to go through section 6 and 7 if the user installs the BioSIMKey by installer. Section 6 and 7 are provided for the user who wants to install the driver of BioSIMKey manually.

6. BioSIMKey driver installation for Win 98 (PC/SC Driver v1.0)

6.1 First step – Installation of PCSC components (For Win 98 user only)

Before using any application software, PCSC components should be installed by the user. The Microsoft Smart Card Based Components 1.0 have been released and are available at http://www.microsoft.com/smartcard/ The Smart Card Base Components 1.0 are also included in the Windows 98 CD-Rom.

Installation from CD-ROM (Win 98 only):

A version of Smart Card base components for win 98 is also included in the SDK.

**Installing Microsoft Smart Card Manager (Skip this step if it has been installed)**

1. Make sure BioSIMKey is not connected to the computer before installation.
2. Within Windows 98, run *Scbase* from "ADT60 Driver" folder in the ACS BioSIMKey Installation CD-ROM.
3. After starting *Scbase*, it will prompt you : "Do you want to install the Smart Base components?" Click "Yes".
4. Select "Yes" for License Agreement.
5. Read the text file and exit program and installation of "Microsoft Win32 Smart Card Base Components" completed. It will prompt you : "Do you want to restart your computer now?" Click "No".
6. Within the same folder, run *Smclib.exe*. It will prompt you : "Do you want to update the Smart Card Driver Library?" Click "Yes".
7. Select "Yes" for License Agreement.
8. It will prompt you for "Do you want to restart your computer now?" Click "Yes" to reboot the computer.

6.2 Second step – BioSIMKey connection with PC

Power on the computer and make sure that an USB port is enabled and working properly. Plug in the BioSIMKey ADT60 into the USB port and "Add New Hardware Wizard" will be invoked automatically as shown below to guide you through the installation process.
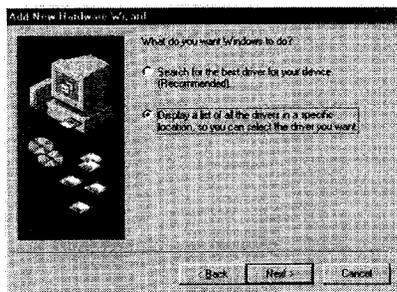
6.3   Third step - Device installation

Insert ACS BioSIMKey installation CD-ROM. Connect the BioSimKey to the USB port under WIN98 environment. Then, the plug and play wizard will prompt as follow.
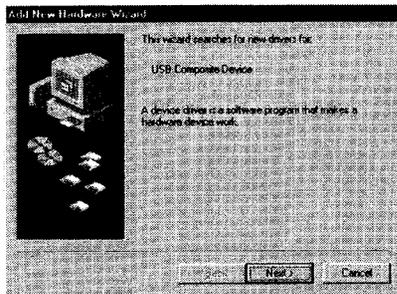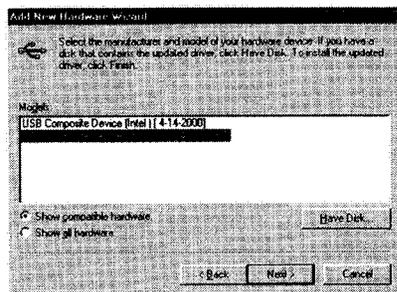

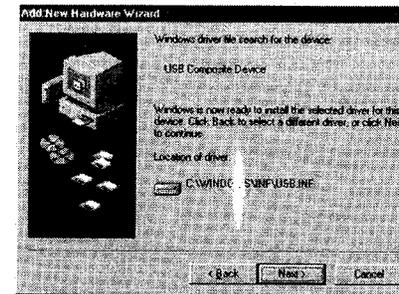**a)**
When the BioSIMKey is plugged, this window appears.

Click **Next**

b)
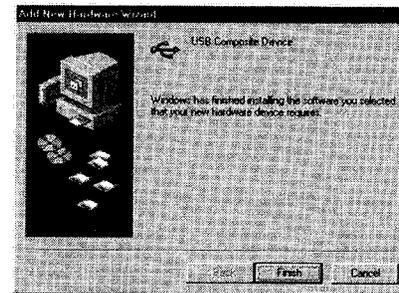Select the "**Display a list of all the drivers in a specific location, so you can select the driver you want**" and click **Next**

c)
Select the "**USB Composite Device [X-X-1999]**" and click **Next**.

d)
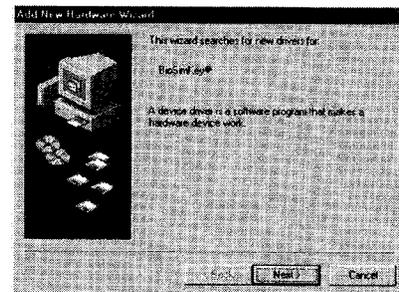The Plug and play wizard notifies the user that the driver files has been found.
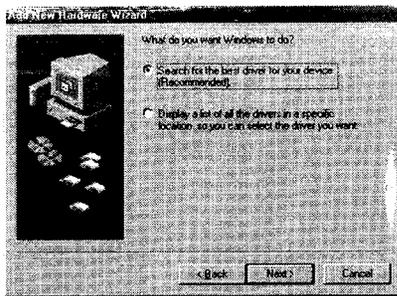
For instance here for composite device: USB.INF

Click **Next**

e)
Installation for composite device is complete.
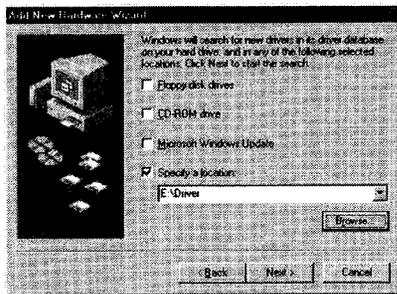
Click **Finish**

f)
The screen will show "Search for BioSIMKey driver" again. This is for the plug-in card reader inside the BioSIMKey.
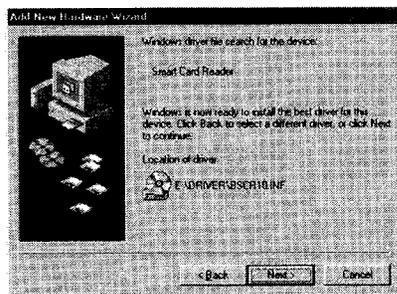
Click **Next**

g)
Select the "**Search for best driver for your device (Recommended)**" and click **Next**.

h)
The user needs to specify "**BSCR10.inf**" location. This file is provided with BioSIMKey SDK. It is located in the distribution CDRom under **drivers** directory

Click Next

i)
The Plug and Play wizard notifies the user that the driver files haves been found.

For instance here for smart card reader: **BSCR10.INF**

Click **Next**

j)
Installation for smart card reader is completed.

Click **Finish**

6.4   Fourth step - TouchChip component installation

Windows will look in system files for TouchChip driver (USBSCAN.SYS). If it is not found Windows will prompt for the user to insert Windows Installation disks. The TouchChip sensor driver is in fact a windows system. It is normally distributed with Windows 98.

6.5   Final Step - Verification

The user can check if the installation is complete by checking if the device is well listed in the system. To do so: go to **Start Menu,** then Settings, then **Control Panel** and then **System,** and click on **device manager** tag and finally look for **Biometric Smart Card readers.**

It must appear as below :
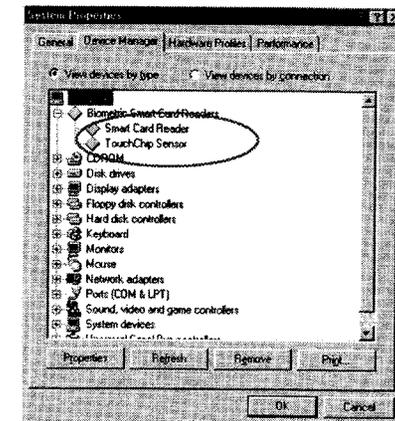
7. BioSIMKey driver installation for Win 2000 (PC/SC Driver v1.0)

7.1 First step – Installation of PCSC components (For Win 2000 user)

PCSC components are already embedded in the operating system; there is therefore no installation required for PCSC components.

7.2 Second step –BioSIMKey connection

Power on the computer and make sure that USB port is enabled and working properly. Plug in the BioSIMKey ADT60 into the USB port and Add New Hardware Wizard will be invoked automatically as shown below to guide you through the installation process.

7.3 Third step - Device installation

The composite device is automatically done by Win 2000. It does not require any action from the user. The PC/SC components are already included inside the system. Smart Card Component installation requires the user to locate the driver file. Therefore the plug and play wizard will prompt as follow.

Insert ACS BioSIMKey installation CD-ROM. Connect the BioSimKey to the USB port under WIN2K environment.
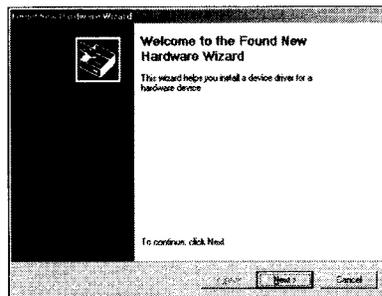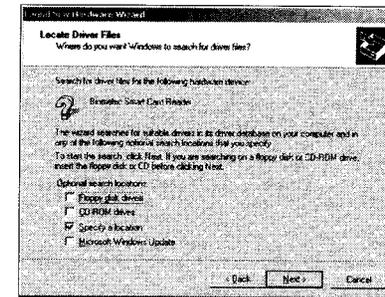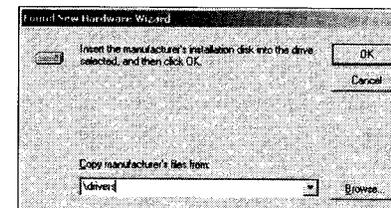
a)
Click **Next**
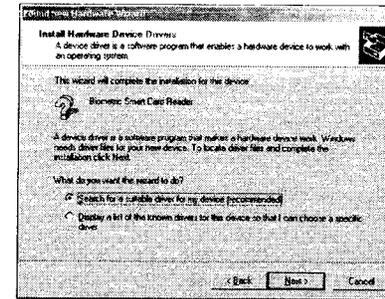
b)
Select the "**Search for a suitable driver for my device (recommended)**"
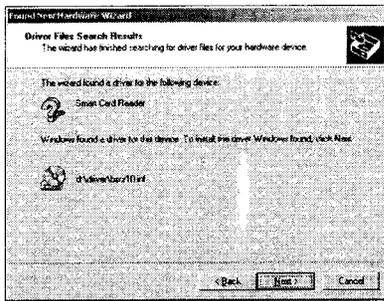
click **Next**

c)
Check **Specify a location** and click **Next**

d)
The user needs to specify "**BSCR10.inf**" location. This file is provided with BioSIMKey SDK. It is located in the distribution CDRom under **Drivers** directory
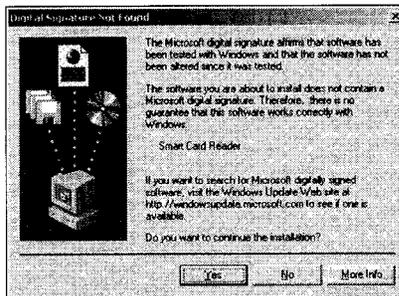
Click **Next**

e)
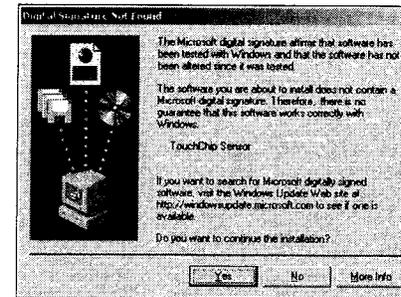The Plug and play wizard notifies the user that the driver files have been found.

Here : BCSC10.INF

Click **Next**

g)
Click **Finish**

7.4 Fourth step - TouchChip component installation

TouchChip component is automatically installed by Win 2000. Only the digital signature notification dialog box will appear :
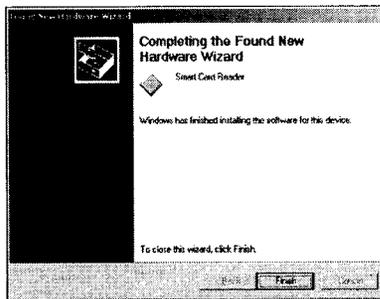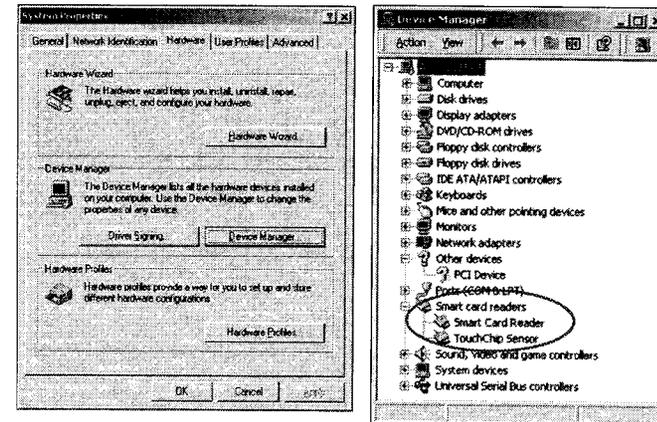

h)
Click **Yes**

7.5 Final Step - Verification

The user can check if the installation is complete by checking if the device is well listed in the system.

To do so : go to **Start Menu,** then Settings, then **Control Panel** and then **System.** Click on **Hardware** tag, then click on **Device manager,** and finally look for **Smart Card readers.**

It must appear as below :

8.   Cleaning of BioSIMKey

Key elements of image equality are the consistency within the actual image and the background of the image. Software algorithms are more accurate and generally faster when the image quality is consistent and the background has not changed dramatically. Dirty residue, oils, or other material on the surface of the Touchchip may obscure the image as shown below. Regular use of the TouchChip may leave residue or other foreign materials on the surface. Performance degradation in terms of False Match and False Non Match is indicative of such problems.

It is recommended that the sensor be visually inspected and periodically cleaned as described in section 8.1. It is also recommended that before each touch, the sensor be cleaned as described in section 8.2

8.1   Periodic Cleaning

Dampen a lint-free cloth or cotton swab with alcohol or acetone. Gently rub the cloth across the senor surface in a left and right direction. Move slowly down the sensor to cover the entire surface area. Repeat this process 4 times. Observe that no residual solution remains on the sensor.

After performing the periodic cleaning operation, a surface conditioning is suggested to obtain the maximum performance of the TouchChip Sensor. Dampen a lint-free cloth with fragrance-free moisturizing lotion, and gently rub the cloth across the sensor. Make sure that all the lotion will be removed as completion of the cleaning process.

8.2   User Cleaning

To obtain the maximum performance, it is recommended that the user simply wipe the sensor with his/her finger before each authentication process, and then position the finger for the authentication. The purpose of this action is to ensure that the residue from previous usage will be removed hence giving the best surface conditioning.