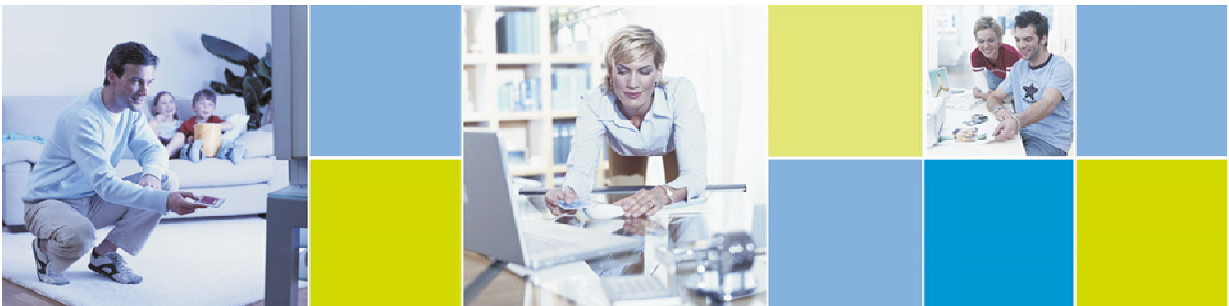


Smartcard Reader

Installation & Troubleshooting Manual

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1. Scope

This manual covers the installation and trouble shooting procedures for second generation smart card readers manufactured by SCM Microsystems, Inc. These procedures are applicable to the following reader models: SCR331 non-CCID, SCR331 CCID, SCR333, SCR335, SCR338, SCR3310, SCR3310v2, SCR3311, SCR3320, SCR3340, SPRX32, SCR355, SCR241 and SCR243. This document covers the installation over the following operating systems: Microsoft © Windows™ 2000 Desktop and Server, Microsoft © Windows™ XP (all editions including SP3), Microsoft © Windows™ Server 2003, Microsoft © Windows™ Vista (all editions) and Microsoft © Windows™ Server 2008. The document covers both x86 and x64 (AMD64/EMT64) where applicable.

2. Audience

The intended audiences for this manual are technical support personnel that need to install and support the reader models listed above in one or more of the operating environment listed above and users of readers in one of the operating environment listed above.

3. Installation

The sections below use an USB reader to walk through the procedure. The procedure is also applicable to the PCMCIA readers. When something is not applicable to PCMCIA, it shall be highlighted in that section.

3.1. *Automatic Installation of Inbox Drivers*



This section is applicable only to USB CCID devices and Express Card devices. This section does not apply to PCMCIA Readers.

When an USB or Express Card reader is plugged into host running Microsoft © Windows™ Vista, the device shall match against the inbox USB CCID driver shipped with the operating system and load the driver. The devices are perfectly compatible with this inbox driver for accessing asynchronous smart cards.

The inbox drivers from Microsoft shall not support the following features:

- Firmware updates for flash based devices
- Synchronous (memory) card support

If one or more of the above features are required, then it is recommended to follow the procedure explained in Section 3.4.

3.2. *Automatic Installation of Drivers by Windows Update*

When device is plugged into the host, the New Hardware wizard pops-up with a window shown in Figure 1 that provides an option to connect to search for a matching driver online at Windows Update website.



Figure 1: Found New Hardware Wizard – online from Windows Update

If the host system is connected and online, then choose this option as shown in Figure 1 to automatically install the drivers. This is the simplest and easiest method to install drivers.

3.3. Downloading Drivers

For other installation methods below, the drivers need to be downloaded from SCM website. The procedure to download drivers is provided below:

- Browse to http://www.scmmicro.com/support/pcs_downloads.php?lang=en
- Select *Driver/Firmware* from the menu at the bottom of the page. The next pop-up menu appears with a list of devices.
- Select the device from the list. The device model name can be found on the label at the bottom of reader. For PCMCIA and Express Card reader, the model name can be found at the back. Once device is selected, the next pop-up menu appears with a list of operating systems.
- Select the operating system that is running on the host.

- A license agreement is displayed below the menu. Click on the check box to accept the End User License Agreement (EULA) and click *Next* to proceed to download page.

The download page is divided into two major sections, namely, firmware and drivers. The top of the page shows any firmware updates that may be applicable for the device. This is followed by the driver section. The driver section shall have three different packages for download, namely,

- Driver only package – this package contains the drivers; only SYS, INF only; no SETUP.EXE or MSI file
- PC/SC Installer – this package contains the PC/SC driver installer; contains SETUP.EXE or MSI file. This is the package that is required by most users.
- CT-API Installer – this package contains the CT-API wrapper also. If the application that is installed requires CT-API, then this is the package to use.

3.4. Installation of drivers through plug-n-play

This would be the procedure to follow if the driver only package (without SETUP.EXE or MSI) is downloaded.

3.4.1. Installation if device is not plugged in

Plug in the device into the host. The Found New Hardware wizard shall come up with the image in Figure 2. Select the options highlighted in Figure 2 and click *Next*.



Figure 2: Found New Hardware Wizard – offline installation

In the next dialog, select the options as shown in Figure 3.



Figure 3

In the next dialog, select the option to search for drivers and provide the folder where drivers are extracted in search path. Figure 4 shows the dialog when the drivers have been extracted to the path *c:\drivers*.

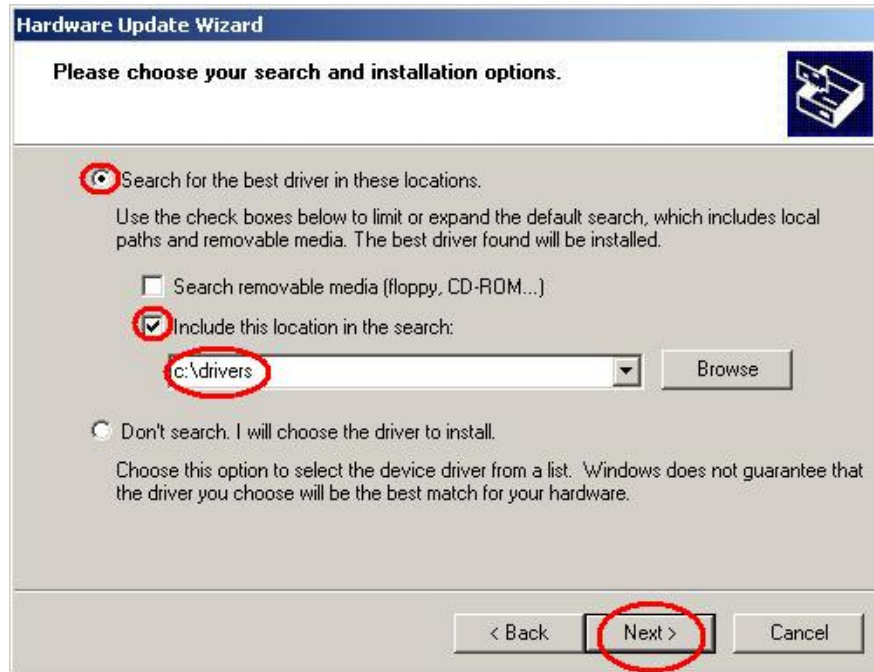


Figure 4: Found New Hardware Wizard – providing driver path

The wizard shall proceed to load the drivers from the location and finally reach the dialog in Figure 5. Hit *Finish* to complete the installation.



Figure 5: Found New Hardware Wizard – complete installation

3.4.2. Installation if device is already plugged in

If the device has already been plugged in, then plugging the device again shall not bring up the New Hardware Wizard. In this case, plug in the device into host and open device manager.



A quick way to access device manager would be to right click on *My Computer* (or *Computer* under Vista), and selecting *Manager* from the pop-up menu. Device Manager can be found under *Computer Management->System Tools*.

The device would appear under *Other Devices* as shown in Figure 6.

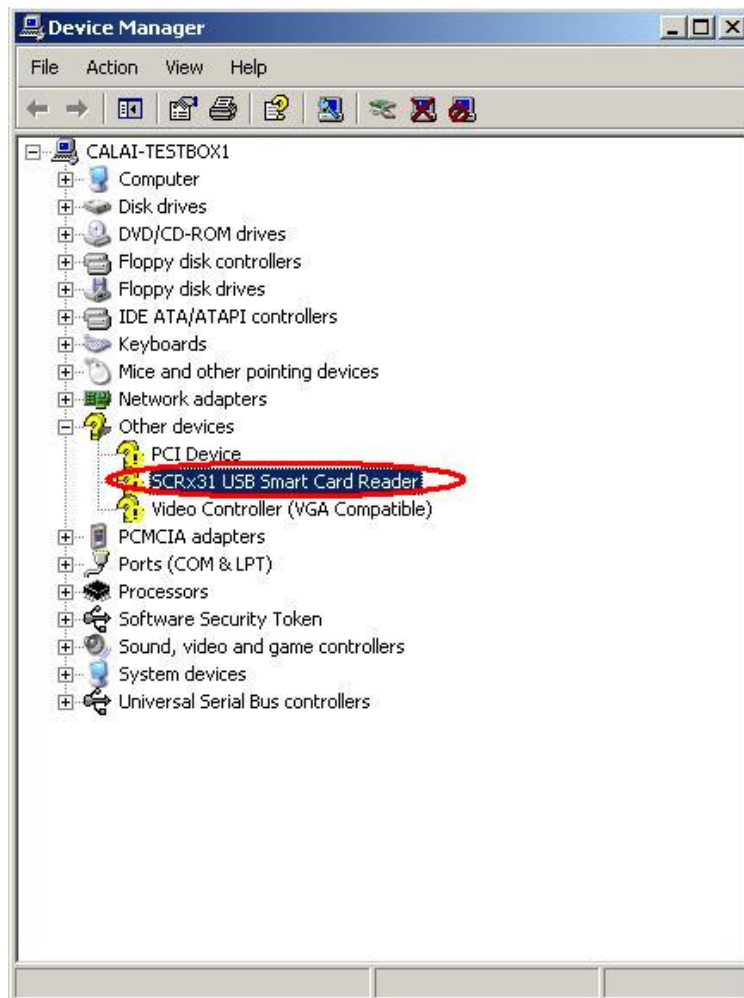


Figure 6: Device Manager – Other Devices

Double click on the device entry to bring up the device entry shown in figure 6. Click on *Reinstall Device...* and follow the procedure in Section 6.4.1.

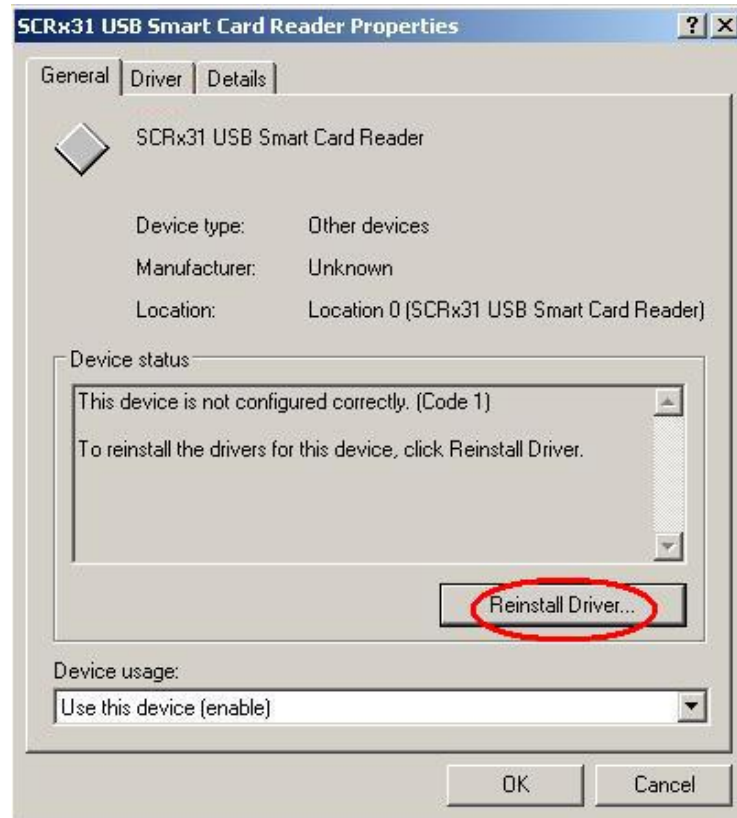


Figure 7: Device Manager - Smart Card Reader Properties

3.5. Installation of drivers through installer

The installer package shall contain either an SETUP executable (EXE file) or a file with MSI extension. Execute one of them to run the installer and follow the prompts.

4. SCR331 non-CCID vs. CCID

There are two different versions of SCR331, namely, non-CCID and CCID. There is no hardware difference between these two versions. The difference is only in the firmware.

The non-CCID version of SCR331 was the original firmware that was released before the CCID specification was released. The firmware revision shall be 1.23, 1.40 or 1.42. These devices shall work properly under Windows™ 98, Windows™ Me, Windows™ 2000, and Windows™ XP x86. Support for this device was discontinued and it is no longer supported under Windows™ XP x64, Windows™ Vista (all versions), Mac OS X or Linux. It is recommended to upgrade the readers to CCID firmware.

For users of Windows™ XP x64 and Windows™ Vista (all versions), SCM provides a special package to upgrade the firmware so that they do not have to look for machine with older operating system. This package can be downloaded from ftp://ftp.us.scmmicro.com/security/drivers/SCR331_non-ccid_to_ccid_update.zip. Unzip the download package. The driver under /driver folder shall match the reader before upgrade. Then run the FWUpdate tool to upgrade the firmware. After upgrade, the reader shall be a CCID reader. Now follow one of the procedures detailed in Section 3 to load driver for the upgraded reader.

5. Troubleshooting

This section explains the common procedures to determine and isolate root cause of non-working reader.

5.1. Troubleshooting with Device Manager

The device manager under Windows provides a wealth of information to determine if a reader is working properly and also to isolate the cause of failure. If you are helping a user, advise user to plug in device to host computer and open device manager.

5.1.1. Device appears under Smart Card Readers

If the device appears under Smart Card Readers as in figure 8, then there are no issues with driver. Move on to Section 5.2.

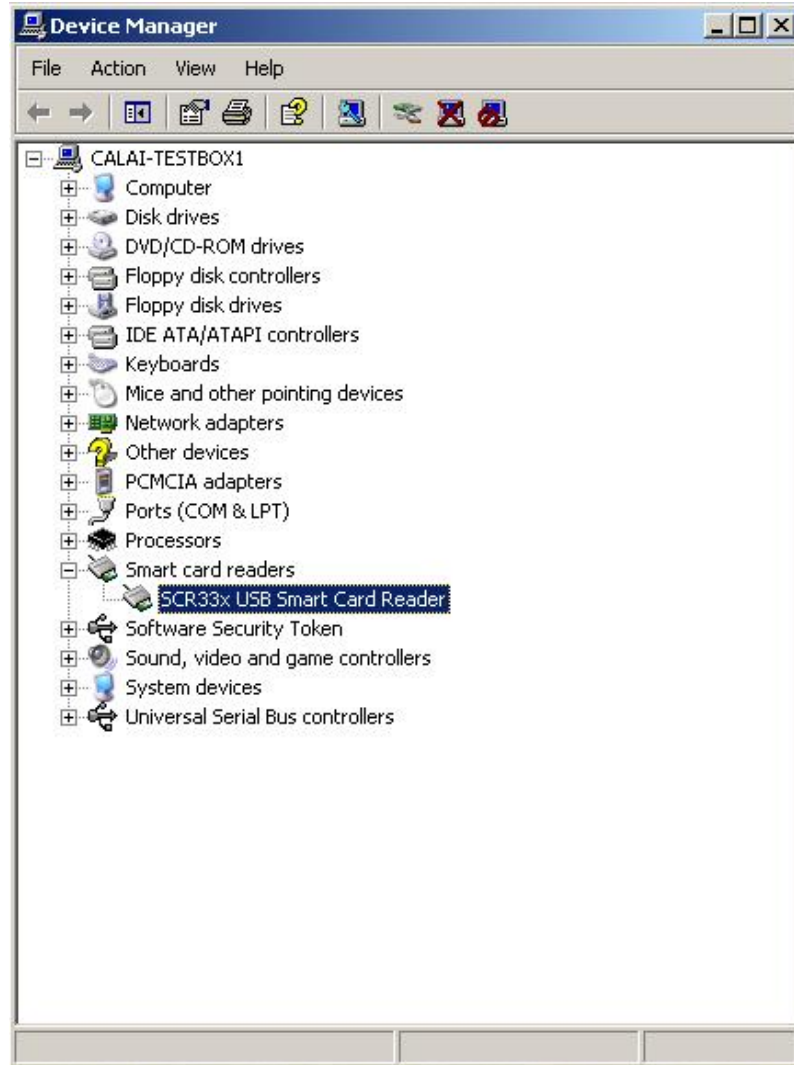


Figure 8: Device Manager – Properly working Smart card reader

5.1.2. Device appears with yellow exclamation

If the device appears under Smart Card Readers as in figure 9, then double click on the device and look into device properties.

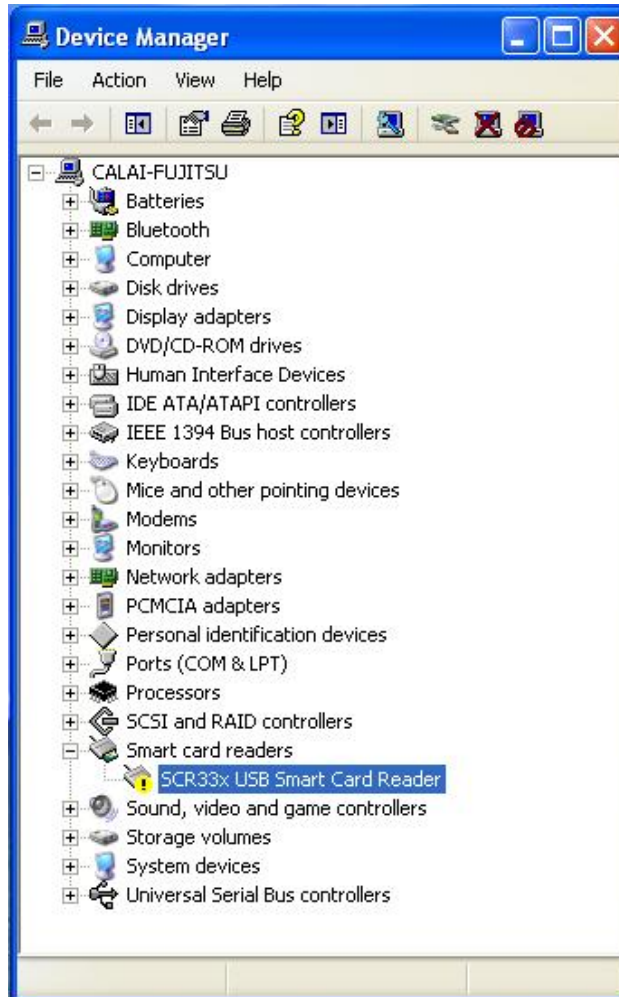


Figure 9: Device Manager – Device with yellow bang

The device properties display more details on the failure under *Device Status* as in Figure 10. Explanation for the error codes can be found in the Microsoft knowledge base accessible at <http://support.microsoft.com/kb/310123>.



Figure 10: Device Manager – Device Status code

5.1.3. Device appears as BootROM or Boot Flash device



This section is applicable to PCMCIA reader only.

If the device appears as **PCDM BOOTROM** or as **PCDM BOOTFLASH** under *Smart card readers* entry in device manager, it implies a corrupt firmware in PCMCIA device. Download the latest firmware from SCM website and run the utility to re-flash the firmware.

5.1.4. Device appears under Other Devices

If the USB or Express Card device appears under *Other Devices* entry in device manager as in figure 11, it implies that a matching driver was not found. Follow procedure in Section 3.4.2 to load a matching driver.

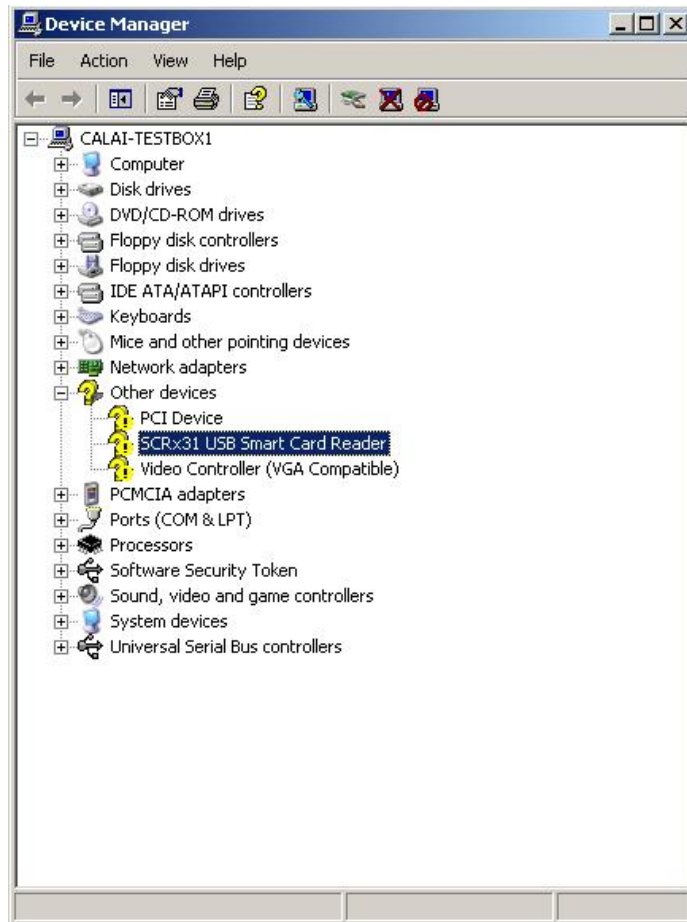


Figure 11: Device Manager – No matching driver

If the PCMCIA device appears as **PCDM BOOTROM** or as **PCDM BOOTFLASH** under *Other Devices* entry in device manager, it implies a corrupt firmware in PCMCIA device. Follow procedure in Section 3.4.2 to match and load the PCMCIA driver. After loading the driver, follow procedure in Section 5.1.3.

If the USB device appears as **STCII Smart Card Reader** under *Other Devices* entry in device manager, it implies that the USB reader has non-CCID firmware. Follow procedure in Section 4.

If the USB or Express Card device appears as **STCII DFU Adapter** under *Other Devices* entry in device manager, it implies a corrupt firmware in the USB or Express Card device. Download the firmware update package for the device from SCM website. The firmware update package contains the matching driver for this device. Install the driver and run the flash update program to re-flash the device.

5.1.5. Device appears as STCII DFU Adapter under USB

If the USB or Express Card device appears as **STCII DFU Adapter** under *Universal Serial Bus Controllers* entry in device manager as shown in figure 12, it implies a corrupt firmware in the USB or Express Card device.

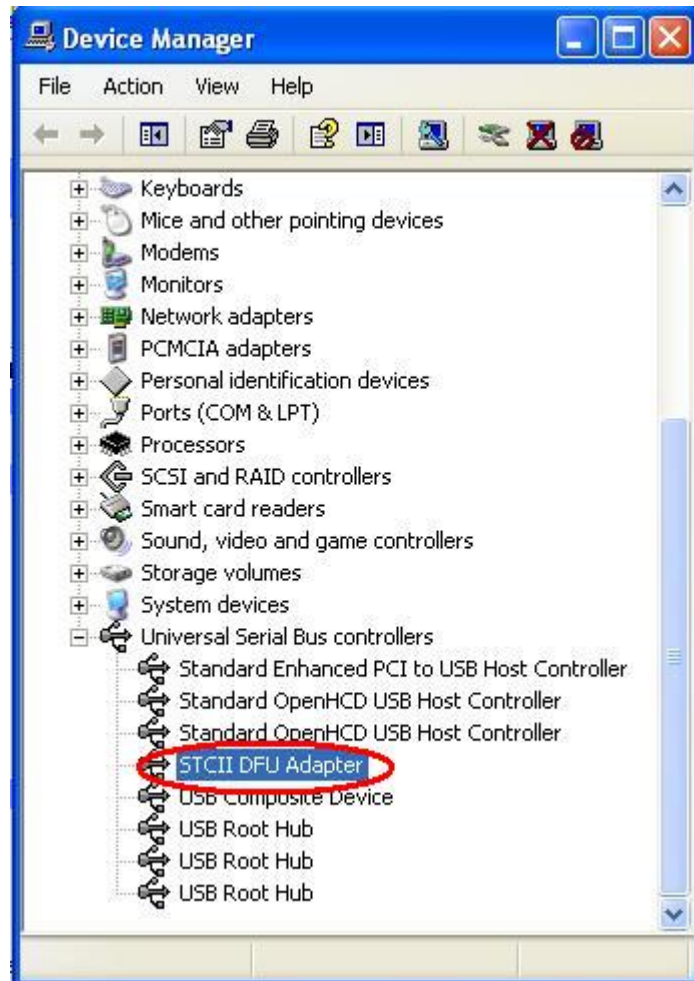


Figure 12: Device Manager – STCII DFU Adapter

Download the firmware update package for the device from SCM website. Run the flash update program to re-flash the device.

5.2. Troubleshooting with Smart PC/SC Diagnostics

The Smart PC/SC Diagnostic tool can be downloaded from SCM website (http://www.scmmicro.com/support/pcs_downloads.php?lang=en) under the *Utilities* section. The opening dialog of the diagnostics appears as in figure 13. Click on *Start* button to begin diagnostics.

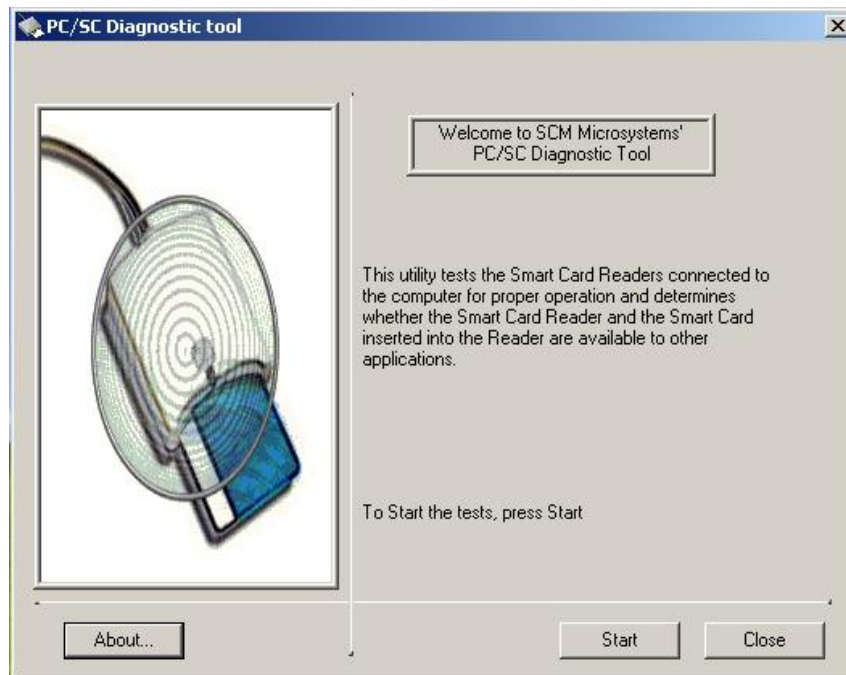


Figure 13: Smart PC/SC Diagnostics – Opening Screen

5.2.1. Resource Manager Problems

If the result is as in figure 14, it implies that the Smartcard Resource Manager Service is not running on the host. Follow procedure in Section 6.1 or 6.2 and repeat the test.

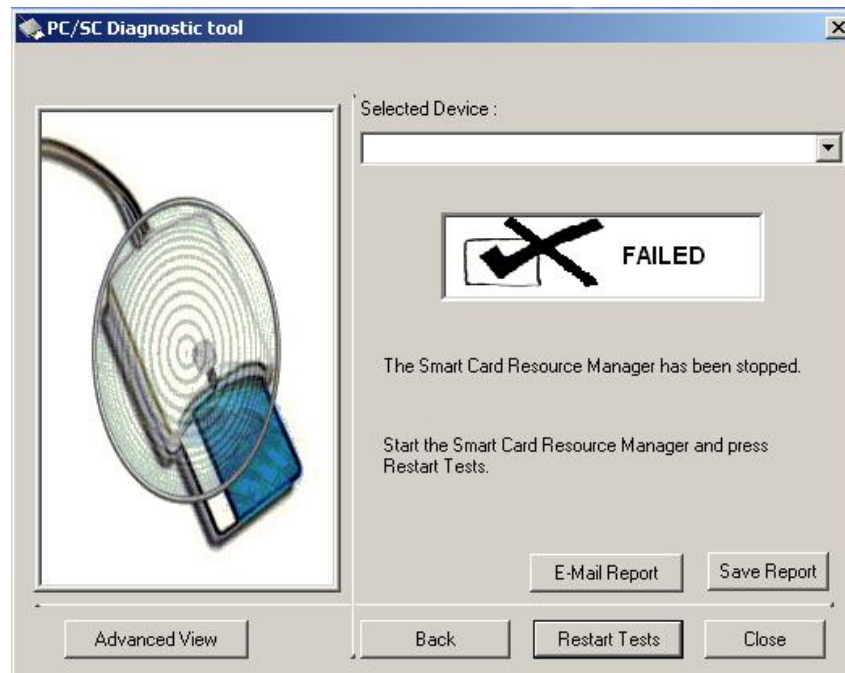


Figure 14: Smart PC/SC Diagnostics – No Resource Manager

5.2.2. No Smart Card Reader

If the result is as in figure 15, ensure that the device is plugged into host. If the device is plugged in, then it implies that the driver might not be installed properly. Follow procedures in Section 5.1 and repeat the test.

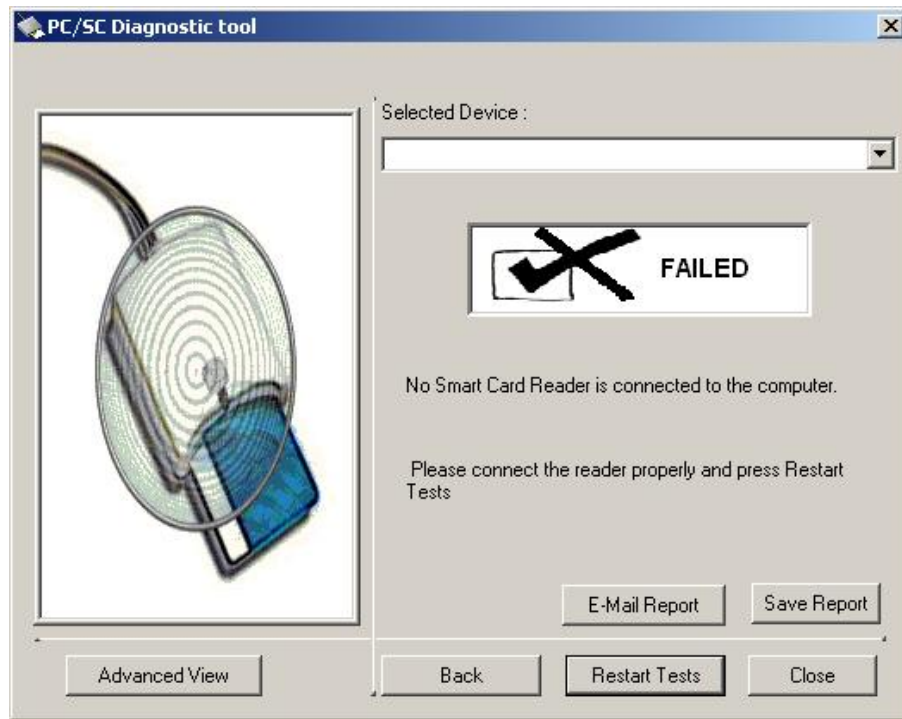


Figure 15: Smart PC/SC Diagnostics – No Reader

5.2.3. No Card Present

If the result is as in figure 16, insert a smart card into the reader. The program shall automatically detect it and change status as in figure 17. If a card is already inserted into reader or there is no change in status after insertion of card, select Advanced View and follow procedure in section 5.3.4

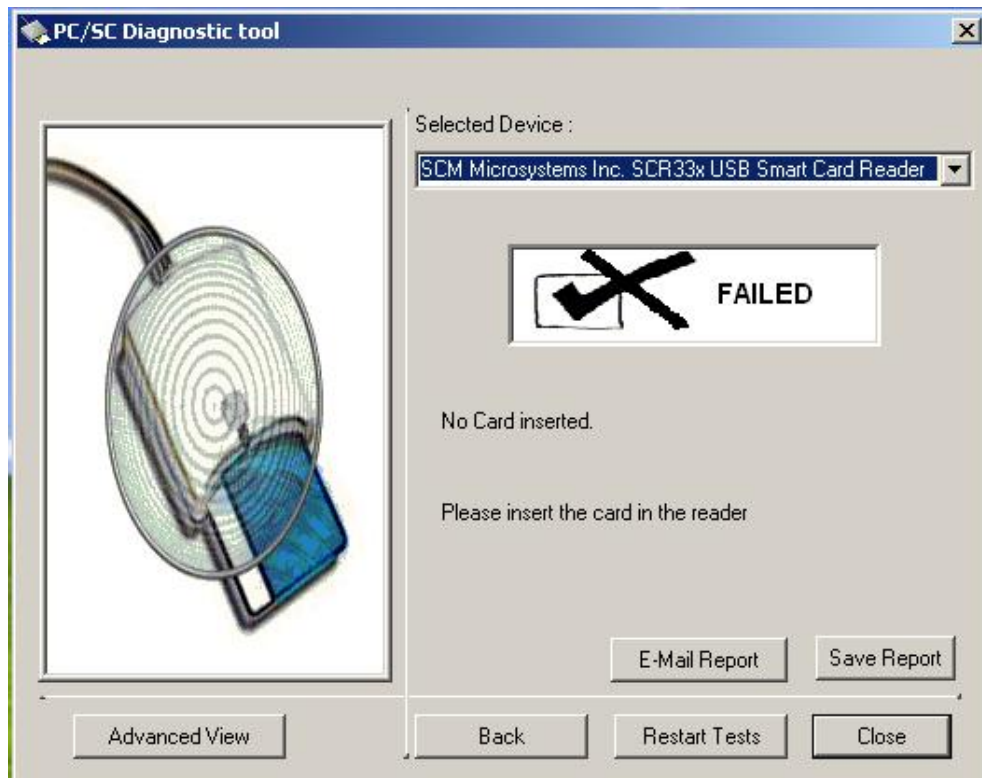


Figure 16: Smart PC/SC Diagnostics – No Card

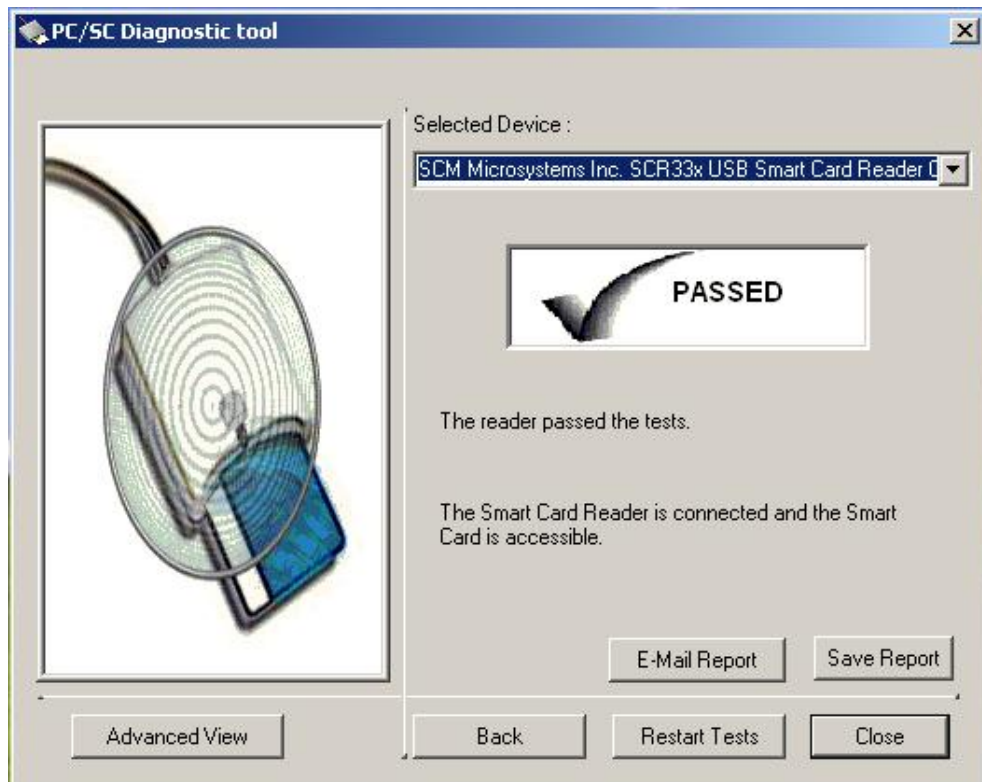


Figure 17: Smart PC/SC Diagnostics - Passed

5.3. Troubleshooting with PC/SC Diagnostics

The PC/SC Diagnostic tool is part of the Smart PC/SC Diagnostics package that can be downloaded from SCM website (http://www.scmmicro.com/support/pcs_downloads.php?lang=en) under the *Utilities* section. The tool can also be accessed by clicking on the *Advanced View* on the Smart PC/SC Diagnostics.

5.3.1. Resource Manager Problems

Look at the bottom left of the status bar, highlighted in figure 18, to identify any resource manager problems. If the resource manager is not running, follow procedure in Section 6.1 or 6.2 and repeat the test.

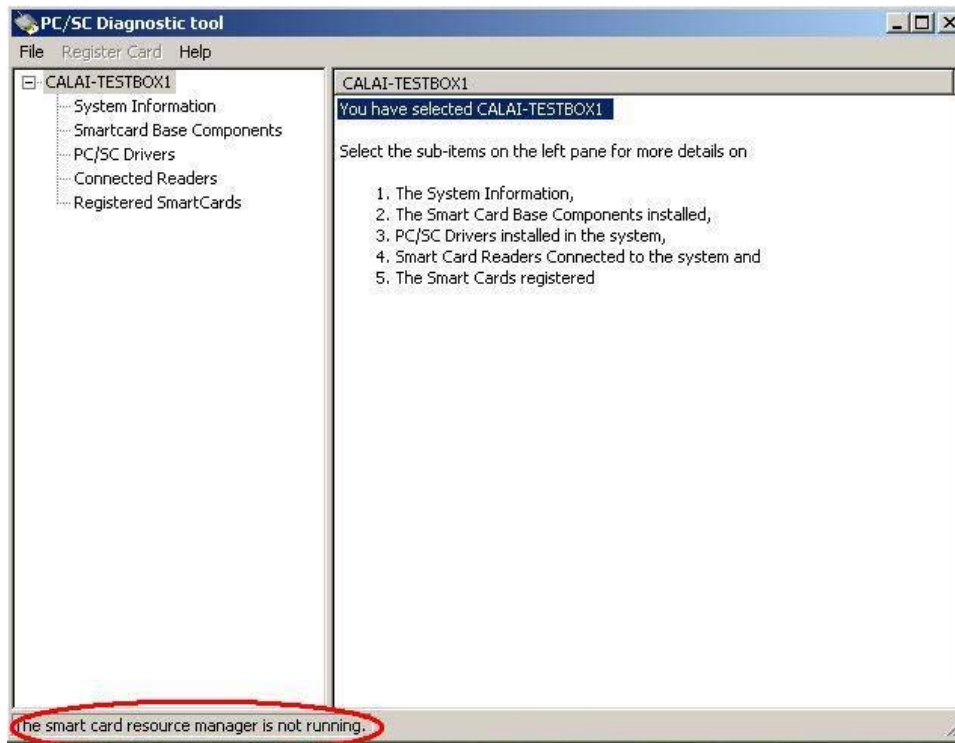


Figure 18: PC/SC Diagnostics – No Resource Manager

5.3.2. No Smart Card Reader

Clicking on *Connected Readers* on PC/SC Diagnostics should display all the smart card readers connected to the host as in figure 19. If it does not display any reader, ensure that the device is plugged into host. If the device is plugged in, then follow procedure in Section 5.1.

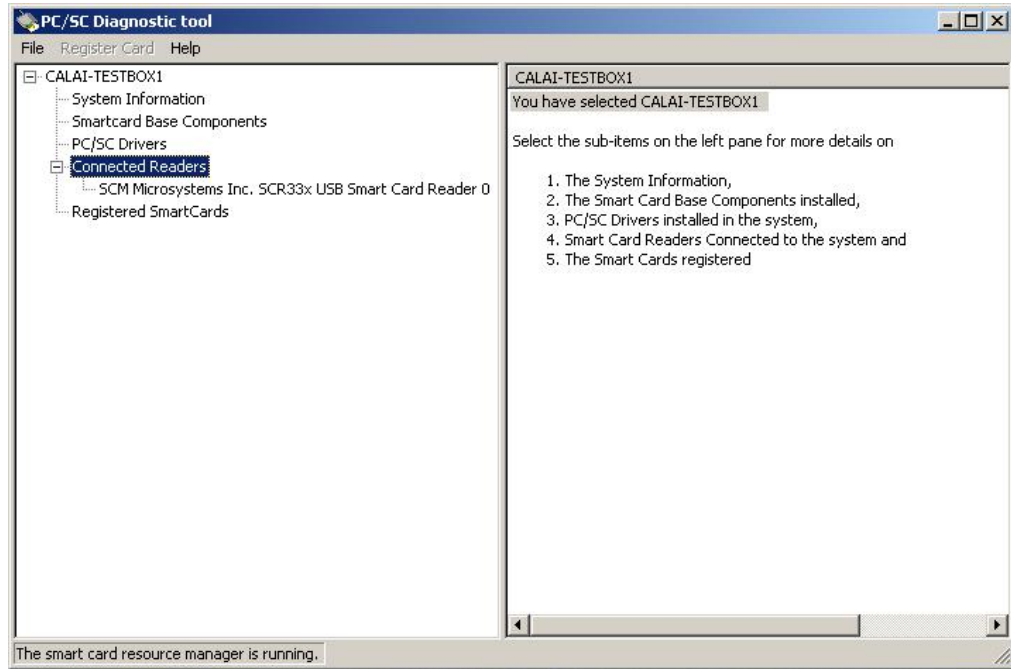


Figure 19: PC/SC Diagnostics – Reader List

5.3.3. No Card Present

When the smart card reader is selected in PC/SC Diagnostics (by clicking on the smart card reader under *Connected Readers*), the right pane shows the reader status. If the card status displayed is *Removed* as in figure 20, then insert a smart card into smart card reader.

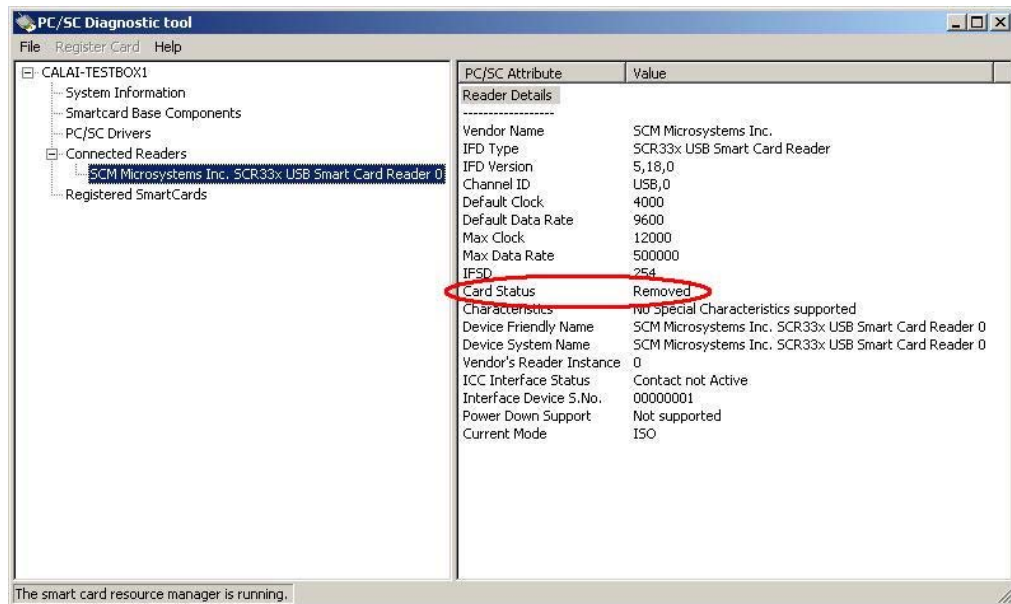


Figure 20: PC/SC Diagnostics – No Card

5.3.4. Card Detect Switch Problem

If a smart card is already inserted into the smart card reader or if inserting a smart card into the smart card reader does not change the *Card Status* in PC/SC Diagnostics from *Removed* to *Inserted*, then it could be a card detect switch problem on the reader. Contact the place of purchase for replacement of reader.

5.3.5. Card Contact Problem

If the *Card Status* in PC/SC Diagnostics changes to *Inserted* when a smart card is inserted into the smart card reader but the *Card Details* are not displayed as in figure 21, then

1. Ensure that the card is inserted in proper orientation. Usually, it is contact side first with contacts facing upward.
2. Ensure that the card is an ISO smart card. There are less common cards that look just ISO smart card but have the contacts at different position (AFNOR).
3. If it is a synchronous (memory) card, ensure that the card is supported by the version of drivers and firmware being used.
4. Check that the card is not defective.
5. Try cleaning the reader contacts using a cleaning card, like K2-HSCB50 from KICTeam.

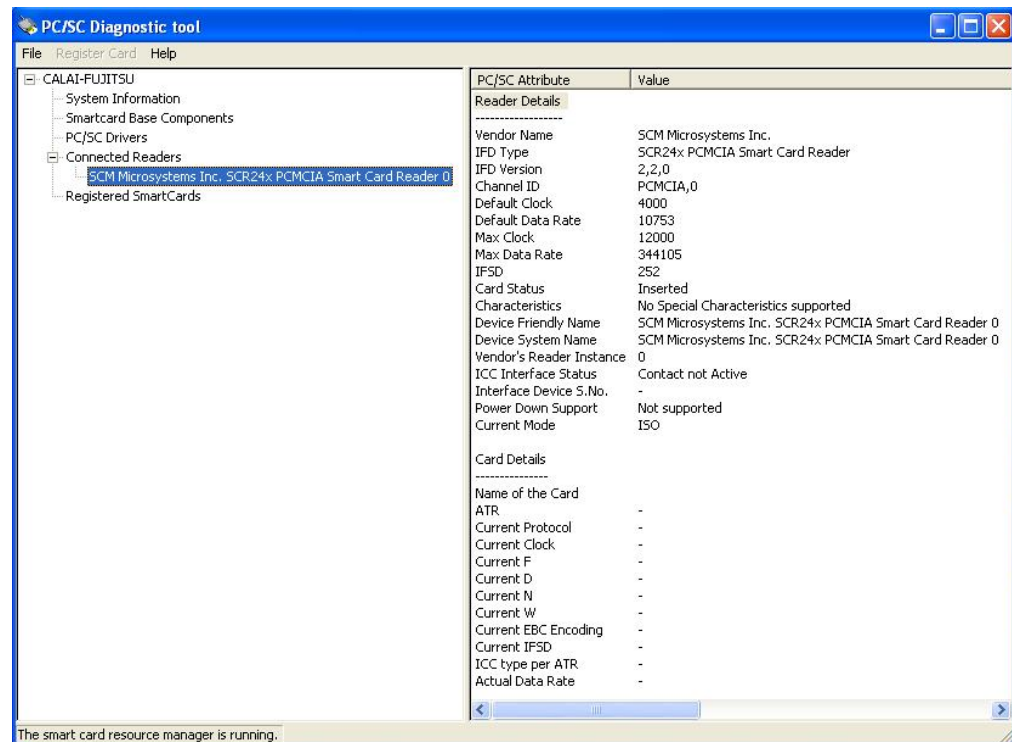


Figure 21: PC/SC Diagnostics – No ATR

If none of the above resolves the problem, then the contacts on the reader may be defective. Contact the place of purchase for replacement of reader.

5.4. Middleware Compatibility



This section is applicable to SCR3320 (SIM card) reader only.

The SCR3320 (SIM reader) behaves differently from other readers in the sense that the card is always present but the device goes away and comes back. In order to detect the dynamic plug-in of device, the middleware needs to be plug-n-play aware. Some older versions of the middleware that are not plug-n-play aware may not be compatible with SCR3320.

6. Miscellaneous Procedures

6.1. Starting Resource Manager from Windows

The Smartcard Resource Manager can be started from the Services menu. To access the Services menu, right click on *My Computer* (*Computer* on Windows™ Vista), select *Manage* from pop-up menu, and click on *Services* under *Services and Applications* entry. The services are listed alphabetically on the right pane as in figure 22.

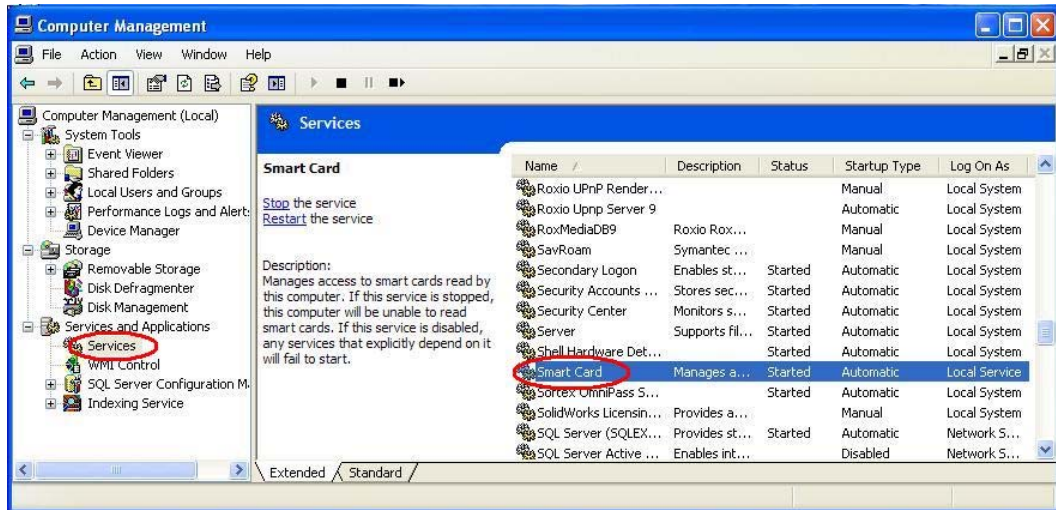


Figure 22: Accessing Smart Card Service

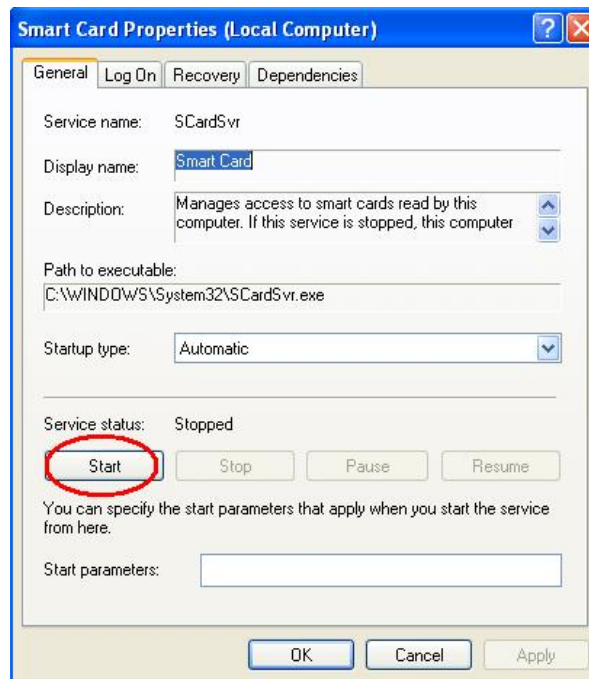


Figure 23: Smart Card Service Properties

Select *Smartcard* service. (Some versions of Windows also have an entry called *Smartcard Helper*. Ignore this entry.) Double click on the service entry to bring up the dialog in figure 23. If the service is not already started, then the *Start* button is enabled. Click on *Start* to run the service.

6.2. Alternate method to Starting Resource Manager

An alternate method to start the resource manager is from the command line. Click *Start* button, select *Run* and type in `net start scardsvr` and click *Ok* to start the resource manager.

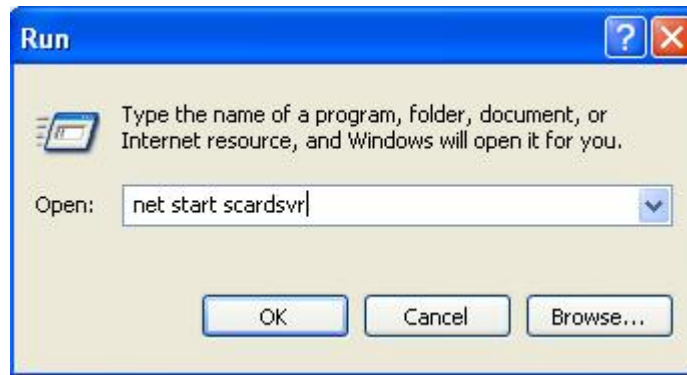


Figure 24: Starting Smart Card Service

6.3. Determining Firmware Version

6.3.1. Through PC/SC Diagnostics

The firmware revision can be determined easily through PC/SC Diagnostics. Select the reader entry under *Connected Readers* on the left pane. The *IFD Version* field on the right pane shall give the firmware version.

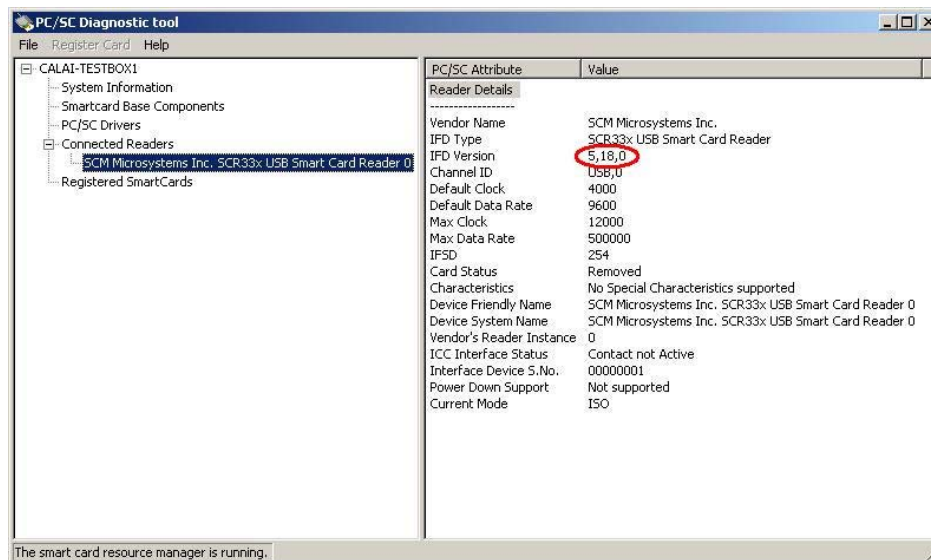


Figure 25: PC/SC Diagnostics - Firmware Revision

In case of USB or Express Card reader, the *IFD Version* field could be *0,0,0*. This implies that the Microsoft USB CCID driver has been loaded for the device. Follow the procedure in 6.3.2 to determine the firmware version.

6.3.2. Through Device Manager



This section is applicable to USB and Express Card readers only.

The firmware version can be identified from the hardware identifier of the device. Select the desired Smart Card Reader in device manager, double click to access the device properties, and move to the *Details* tab as shown in figure 26. Now select the *Hardware IDs* field from the drop down list. The four digit number that follows the *Rev_* is the firmware revision. For example, the firmware shown in figure 26 is 5.18.

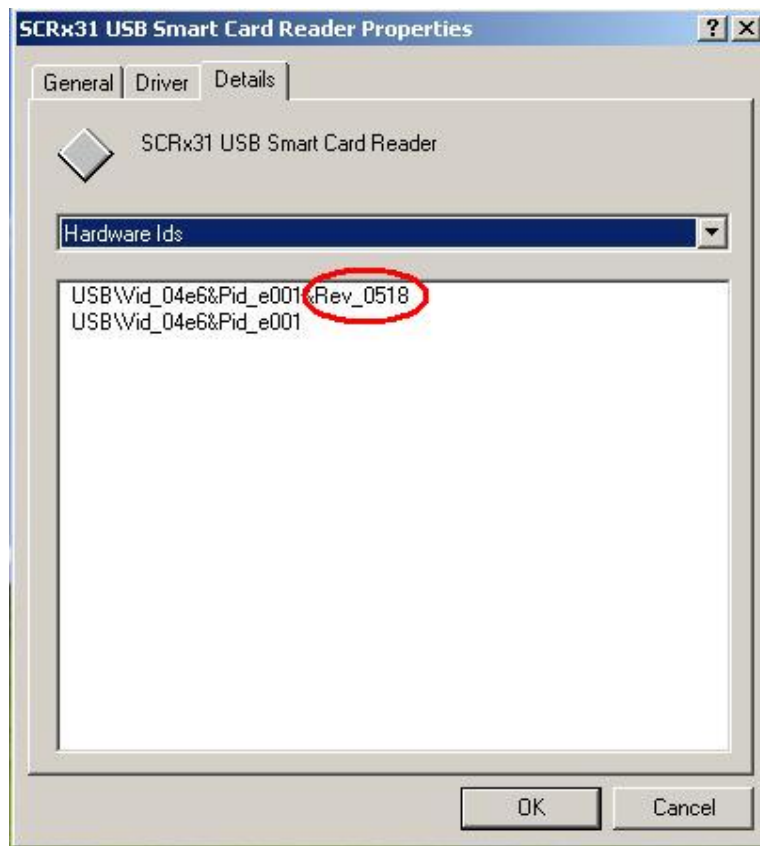


Figure 26: Device Manager – Firmware Revision from Hardware ID

Technical Support

For further support or assistance using the reader, please contact the retailer or the place of purchase that sold the reader.

As OEM supplier, SCM Microsystems does not offer end-user support. Distributors that buy products directly from SCM Microsystems have access to SCM Microsystem's second level of support through phone or e-mail. The support is restricted to reader only and does not cover software that could be bundled by the distributor or reseller.

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