Semiconductors

UM0201_5

SCRTester user manual

Rev. 1.5 — 2006-02-02 **User Manual**

Document information

Info	Content
Keywords	Smart card reader, USB, Serial, I2C, SPI, PCSC
Abstract	*SCRTester is a PC software allowing to communicate with all Philips smart card reader demo boards through several links (RS-232 serial, USB, PC/SC, I^2C, SPI). This software is composed of 2 views and several menus in order to manage the sending of a command from the PC to the smart card reader. More specific script files can be used to implement a dialog between the smart card and the reader.*

PHILIPS

Revision history

Rev	Date	Description	Author
UM0201-01	2002 Apr 22	Initial release describing the SCRTester application version 1.3.0.0	J.Pele
UM0201-02	2002 Oct 9	SCRTester version 1.4.0.0: Add the USB PC/SC, I^2C and Register tool management.	J. Pele
UM0201-03	2004 June 23	SCRTester version 1.5.0.1: Add the SPI management.	T.Payet
UM0201-04	2002 Nov 30	SCRTester version 1.5.0.3: Adding the handshake mechanism management.	T.Payet
UM0201-05	2005 Dec 23	SCRTester version 1.6.2.0: Adding new USB driver for PN531.	T.Payet

Contact information

For additional information, please visit: http://www.semiconductors.philips.com

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1. Content

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2. Introduction

References

Document name	*Please refer to:*
PN531 v3.4 user manual	107506.pdf (UM0301-06)
PN531 v4.2 user manual	(UM0501-02)
PN531 C2 Datasheet	111903.pdf
Mifare specification	www.semiconductors.philips.com/markets/identification/datasheets/
DESfire specification	M075031.pdf
ISO14443 specification (T=CL)	ISO14443-3 specification ISO14443-4 specification
NFCIP-1 specification	ISO18092 specification

Glossary

NFC	Near Field Communication
TAMA	PN531
HSU	High Speed UART
SMX	Philips SmartMX (Memory Extension)

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2.1 Software installation

The smart card reader software install shield is located either in several floppy disks named: "*SCRTester v1.X.X.X Disk 1/z*" or in only one executable file with name describing the interface used.

Procedure: - Insert the first floppy disk and execute the setup.exe file **or** execute directly the executable file if you don't use the floppy disks.
- Follow the installation procedure with the default settings.

2.2 New USB Driver installation

Starting with PN531 C2 version 4.1 and above, it is recommended to use the new USB driver (PN531_USB.SYS).
This new driver has passed USB certification.

In case you have already installed the previous USB driver (USB_Test.sys) on your PC, you will need to follow the below procedure in order to properly install the new driver "PN531_USB.sys.

Notes: It is not possible to use "update driver" functionality in the device manager, because the new driver has a different name, a different .inf, and a different category (now PN531 will appear directly under USB controller, not under smart card reader)

Procedure:

1) plug PN531 board

2) Do "Uninstall..." in the device manager

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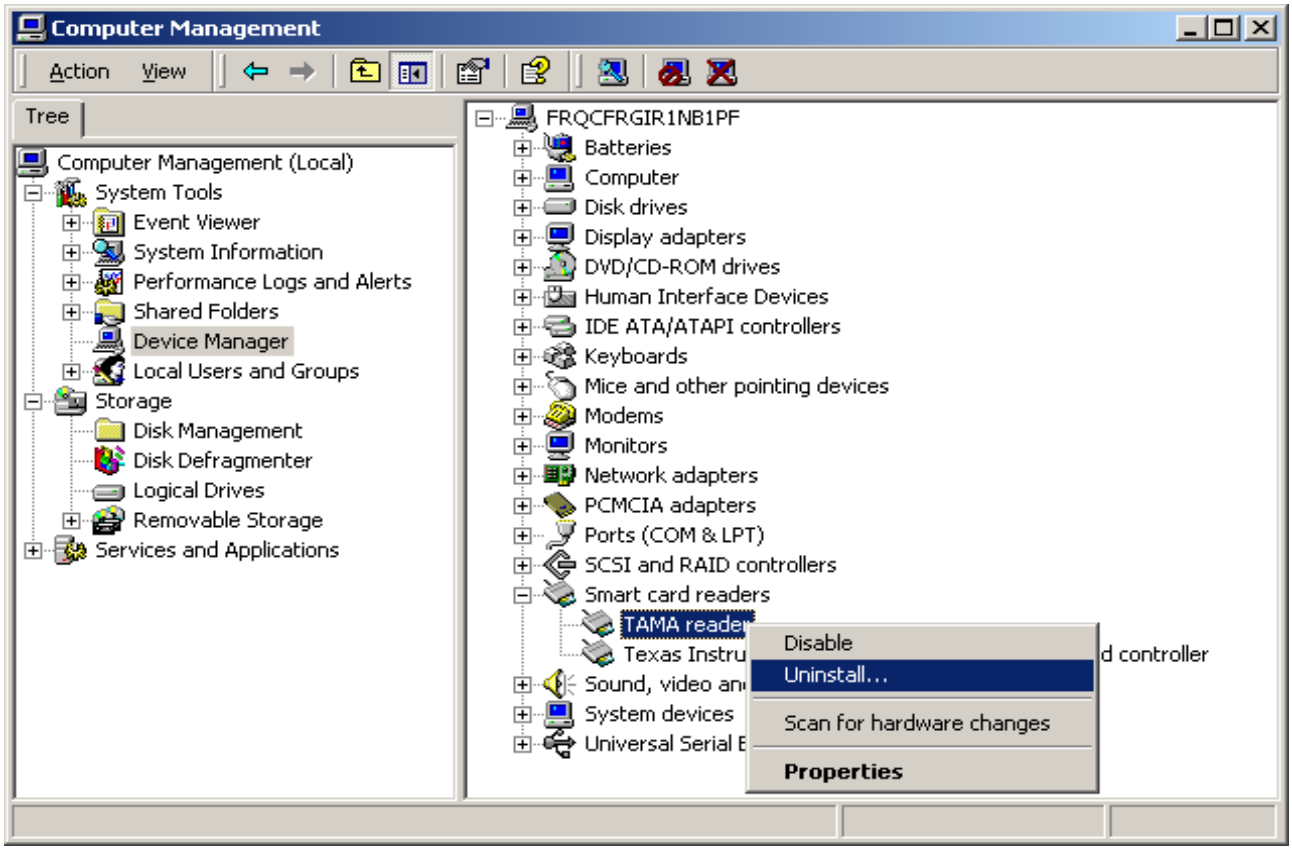

The following message should appear:

Press OK button to start the uninstall procedure

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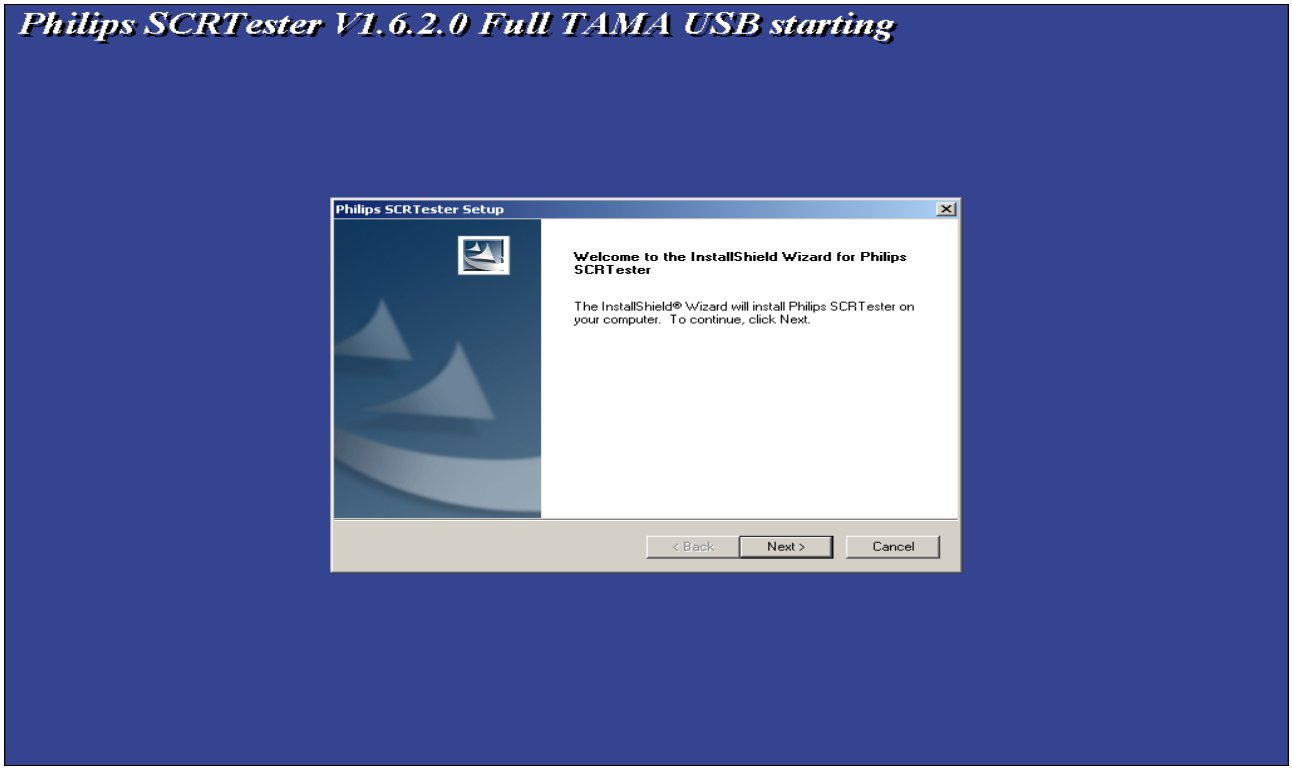
3) Unplug TAMA board

4) Delete file "C:\WINNT\system32\drivers\USB_Test.sys"

5) In the directory "C:\WINNT\inf", Edit all oem**.inf file and delete those who are related to USB_Test driver. Delete also corresponding "oem**.pnf" files.

You are now ready to Install SCRTester using the installshield file “SCRTesterV1620_Full_TamaUSB.exe”.



Proceed with “Next” button.

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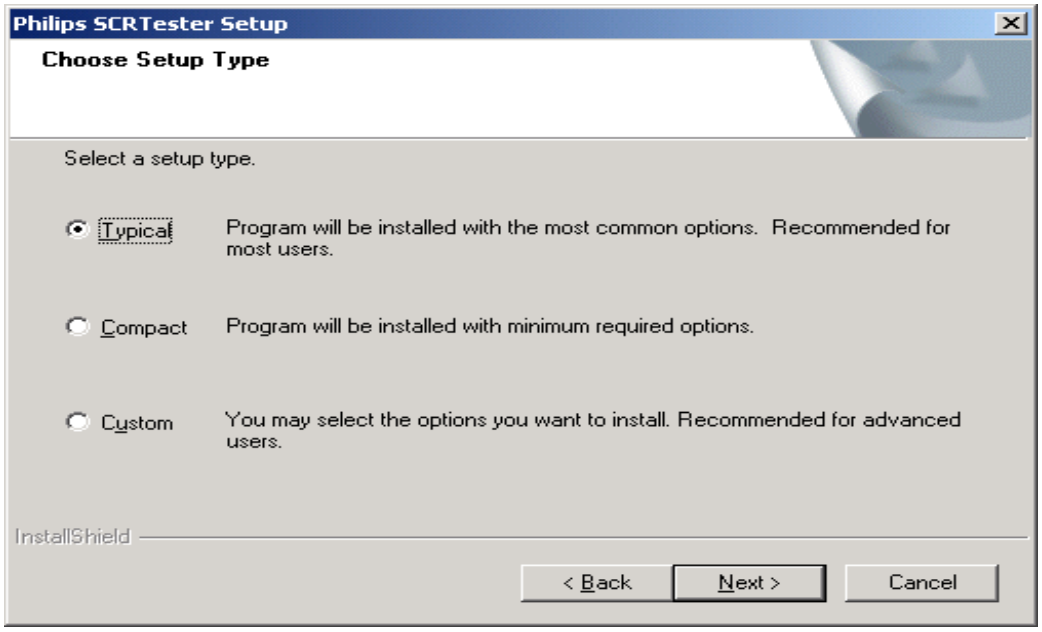
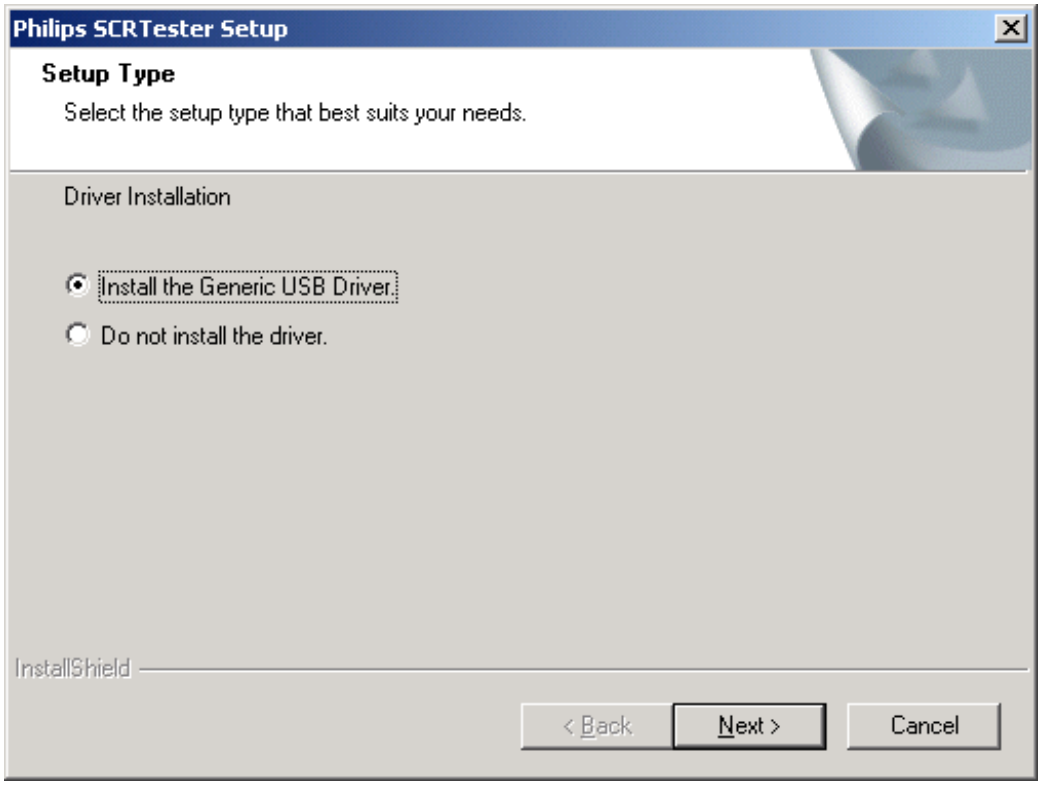


Select typical installation and proceed with “Next” button.



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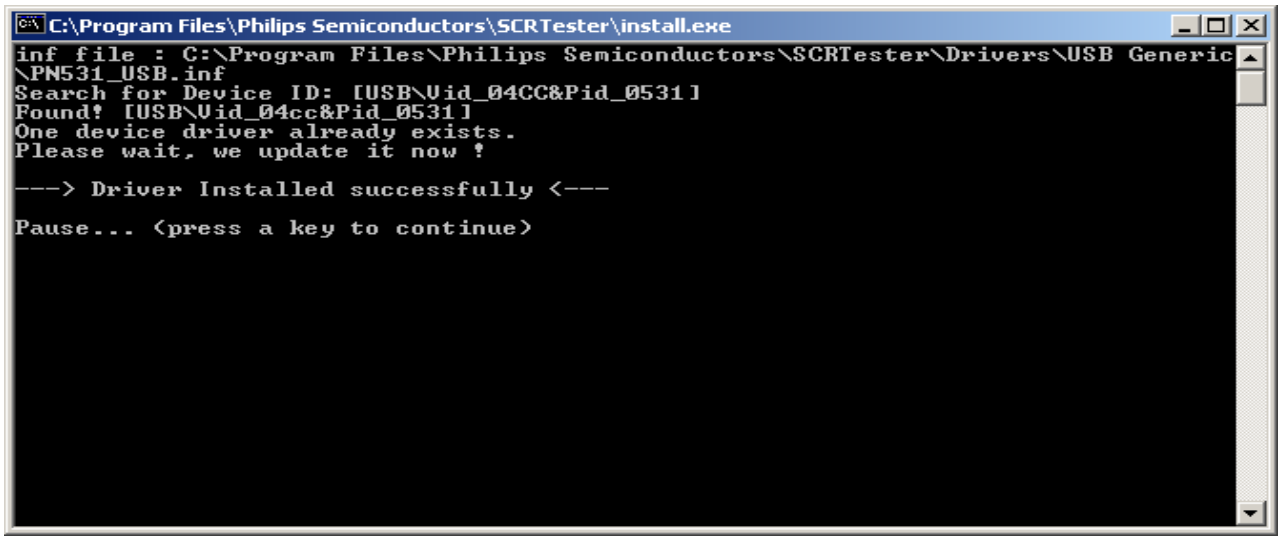
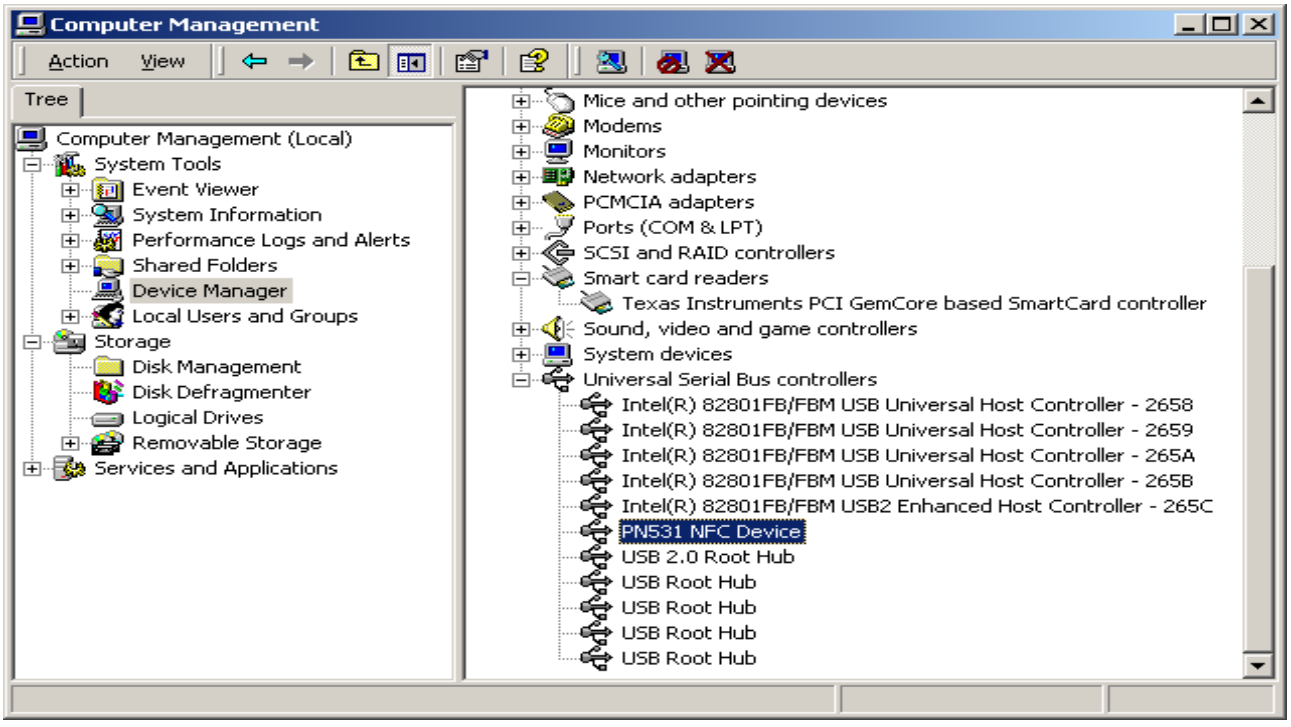
Install the generic USB driver.

Connect the USB demo board then proceed with the *Next* button.



If you have a look at the Windows Device Manager, the PN531 reader will be enumerated as below.



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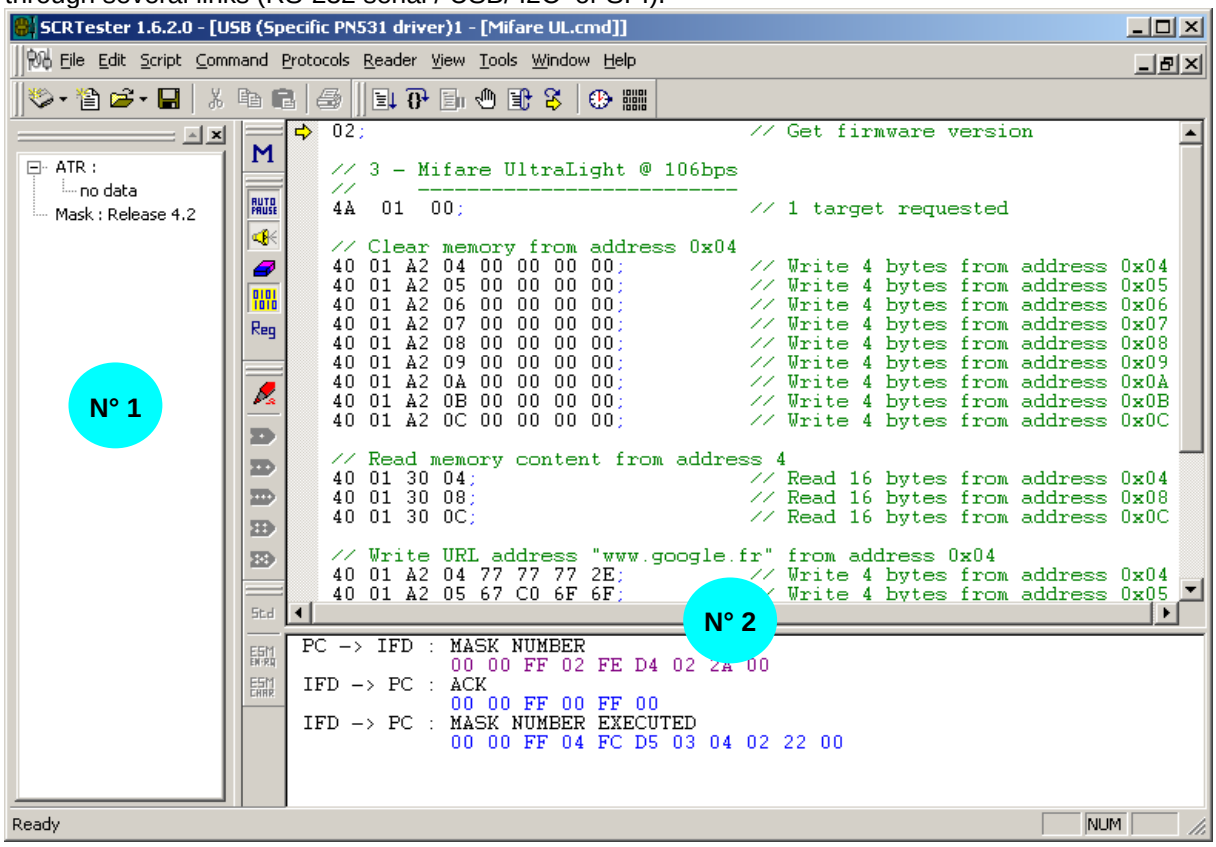
2.3 Software description

SCRTester is a PC software allowing to communicate with a Philips smart card reader demo board through several links (RS-232 serial / USB/ I2C or SPI).



This software is composed of 2 views, 9 toolbars and several menus.

The first view (N°1) shows selected card ATR and the firmware release. The second one (N°2) is split in two parts. The top view is used to implement a script file and the bottom one to see each command answer.

The toolbars allow a quick access to the main commands, for example PowerUp command or Mask command. All commands are described in the Commands description section.

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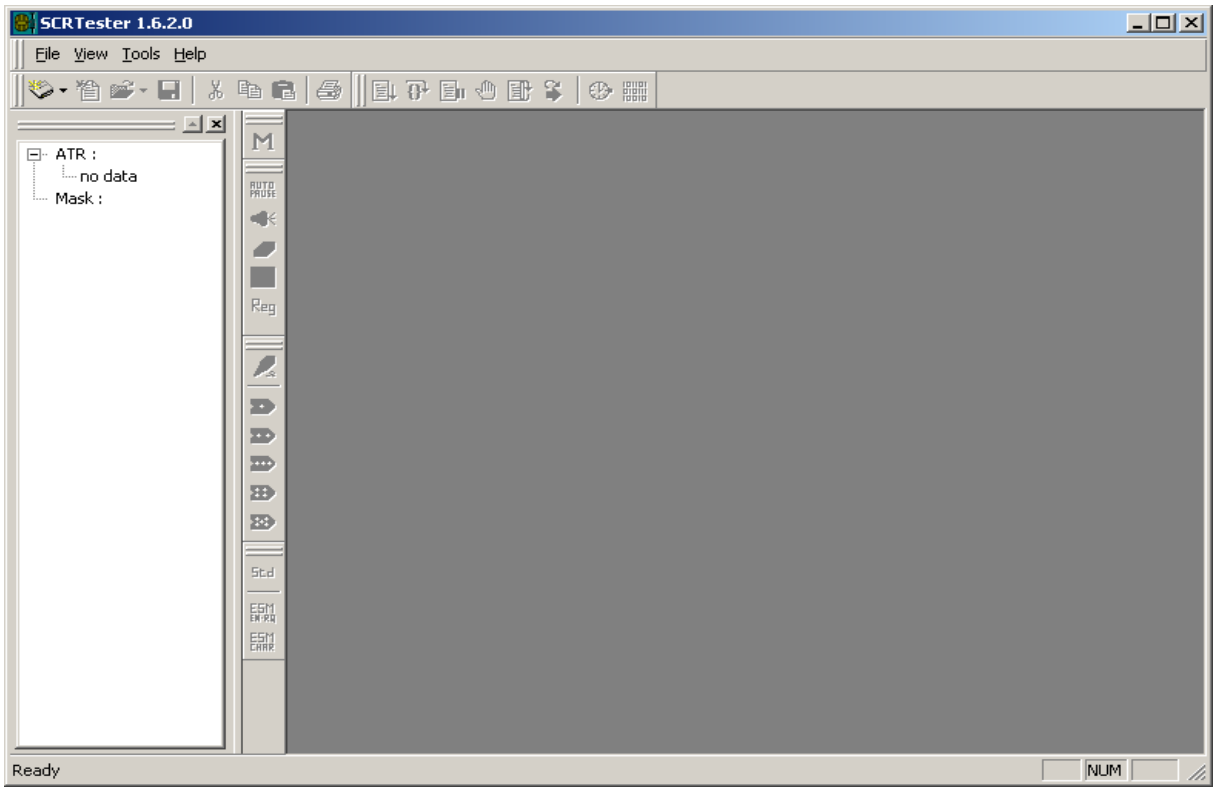
3. Getting Started

This part explains how to use this software with a Philips Semiconductors serial or USB demo board.
First, close all windows to see the following situation.

New serial, USB, PC/SC, I^2C or SPI device

Click on the “New” button: 

You can also use “New” in the “File” menu.



A dialog box offers you several link to connect you reader, choose the communication type.
Select the right type for your smart card reader and proceed with *OK* button.

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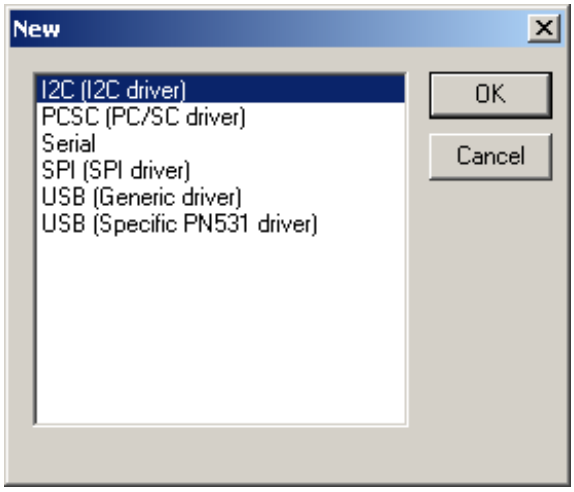
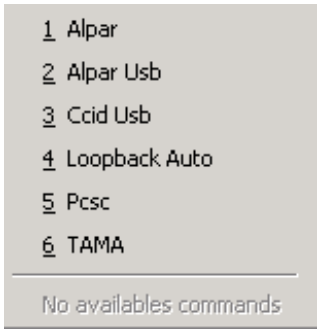


3.1 Protocol Initialisation

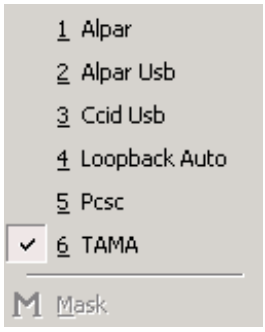
Select the correct protocol in the “Protocols” menu. After this initialisation, you can see all available basic commands in the same menu.

For example, you can choose the Alpar protocol for an ALPAR serial reader:

Before initialisation:



After initialisation:



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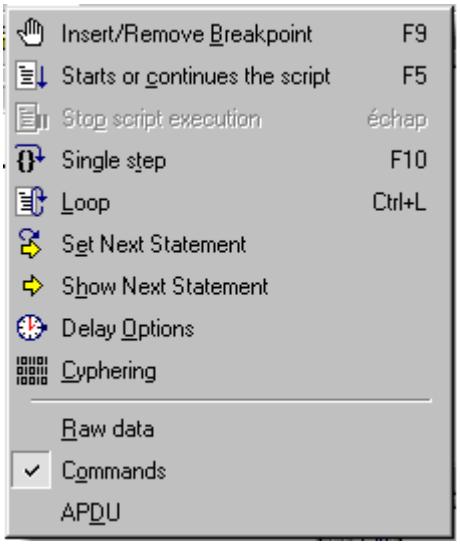
3.2 Command type selection

Select the command type in the “Script” menu. Choose “Command”.



3.3 Protocol mode

Select the protocol mode in the submenu “Mode” in the “Protocols” menu.
The correct mode to use is referenced in the demo board application note. If the mode is not referenced in the application note, choose the “Standard” Mode.
With TAMA protocol, sub menu Mode is not available so select the Handshaking Mode using “ESM EN-RQ” buttons below.

Rem : You can also use these buttons :

3.4 Protocol standard

Select the protocol standard in the submenu “Standard” in the “Protocols” menu. Choose “ISO”.
For more details about the standard to use, refer to the demo board application note.
This menu is not available with TAMA protocol.

Rem : You can also use these buttons :

3.5 Reader Initialisation

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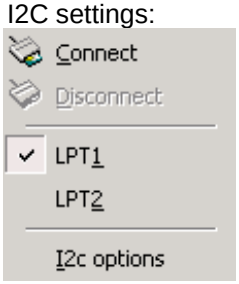
Click on “Connect” in the “Reader” menu. Each type of reader has a specific menu. If you use a serial smart card reader, you can also choose the serial setting in the same menu. The default serial configuration is normally correct. If it is not the case, see the demo board application note. For a USB reader, you don’t have specific settings. You just have to select the “Connect” menu.
With either I2C or SPI readers, an option menu allows changing the interface set-up.

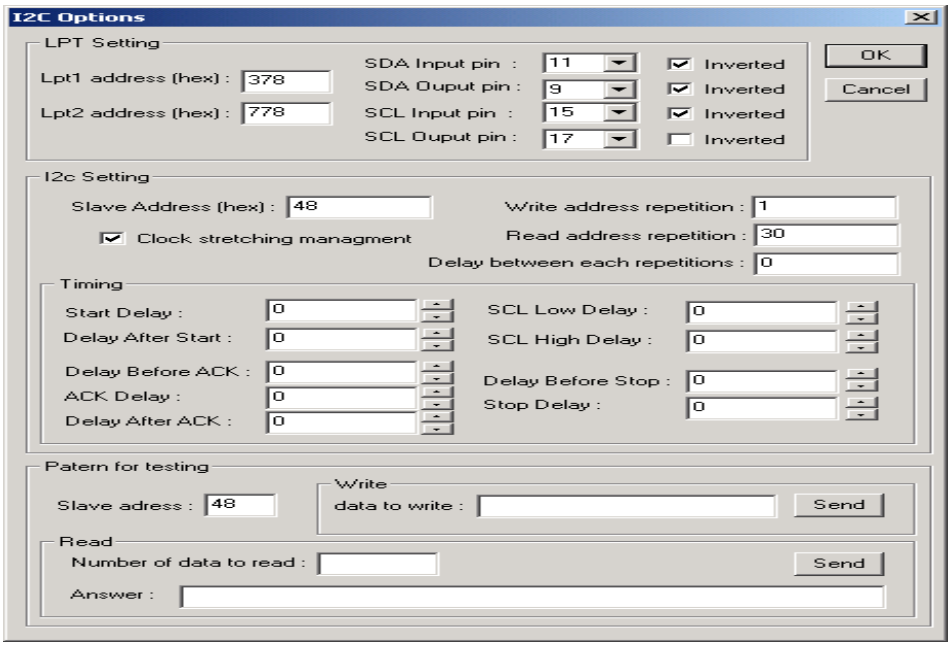
3.5.1 I2C interface

I2C settings:



Select the I2C options.

I2C options:



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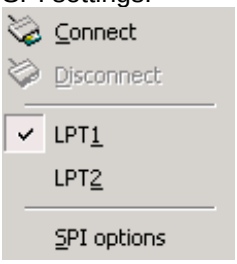
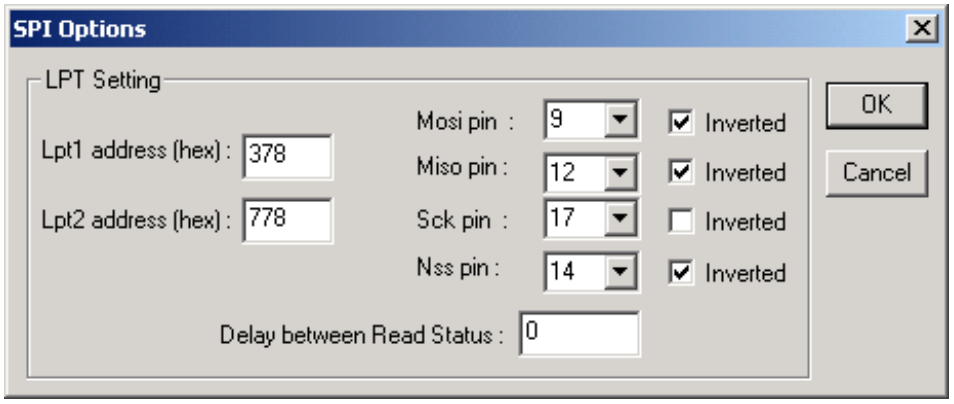
3.5.2 SPI interface

SPI settings:



Select the SPI options.

SPI options:



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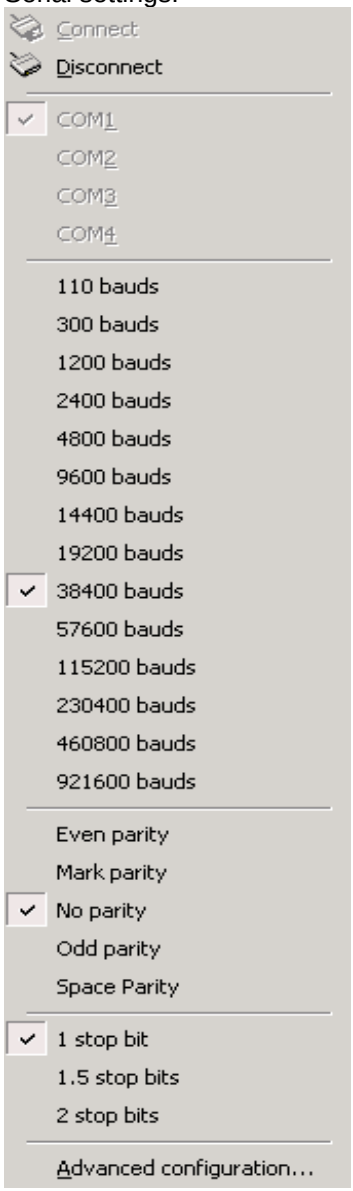
3.5.3 Serial and USB interface

Serial settings:



USB settings:

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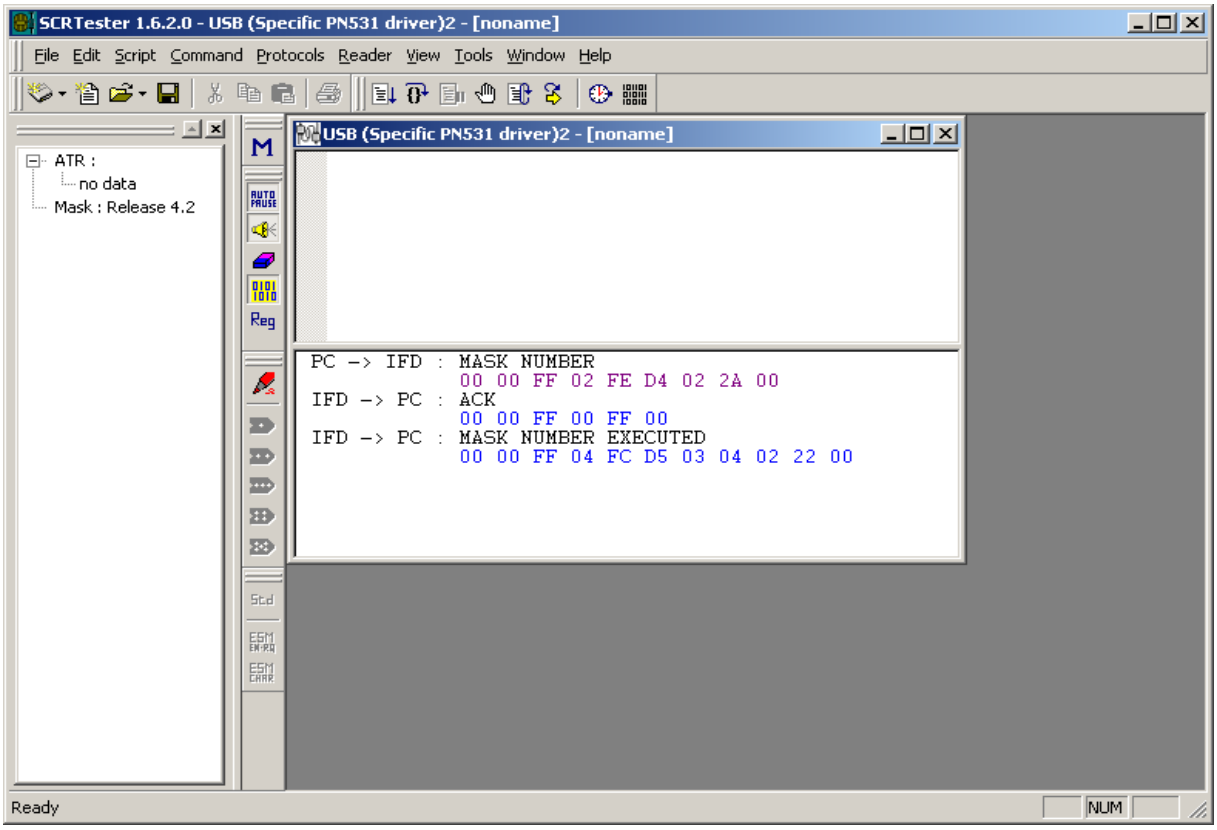
3.6 First test

For testing the initialisation, Click on the “Mask number” button: 

After that, you can see the command sent to the reader and the answer frame in the output view.



3.7 Script execution.

Clear all data in the output view by clicking on the button: 

Open the test script file, named “Mifare Std.cmd”, by clicking on the button: 

Execute the script step by step by clicking on the button: 

Execute the script sequentially by clicking on the button: 

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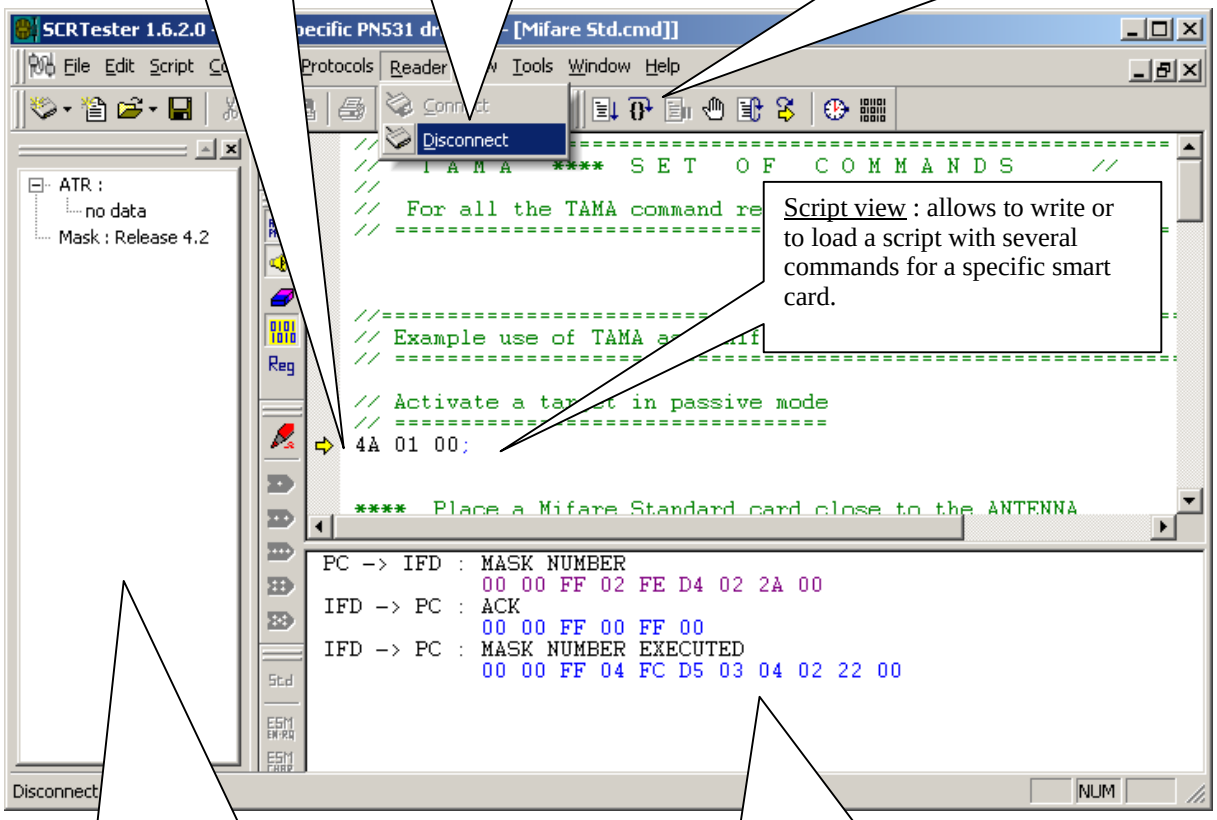
3.8 General view

The yellow array : indicates the next command to be executed.

- Connect : create a link to the device driver.
- Disconnect : delete the link

Toolbars with respectively the :
- Start button (F5) (begin to end)
- Step button (F10) (step by step)
- Stop button (Esc)
- Breakpoint button (F9)
- Loop button (ctrl+L) (begin to end in loop)



Script view : allows to write or to load a script with several commands for a specific smart card.

Parameters view : Allows to display the Answer To Reset card (ATR) decoding (specific smart card parameters), when using contact readers and the Mask Number of the reader component.

Output view : Allows to display the command sent (PC->IFD) and the answer received (IFD->PC)

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4. Script File Description

The script view allows to write several commands that are sent to the smart card reader.

- To send the commands step by step, use the “F10” key or the “Step” button: 

- To send the script from the beginning to the end, use the “F5” key or the “Start” button: 

- To send the script in loop mode, use the “Ctrl+L” key or the “Loop” button:  before the “Start” button. You can also use the specific command “.loop;” in the script. For more details, see the help file (“F1” key).

- To stop the script execution, use the “Esc” key or the “Stop” button: 

4.1 Commands

A command is composed of bytes in hexadecimal value. Each byte is represented by 2 characters, for instance: 02 = 0x02, and each byte is separated by a space character. End of the command is specified with a semi coma character and a command can be separated in several lines.
It is possible to use ASCII characters. These ones are put in quotation marks.
You will find bellow some command examples for the TAMA protocol.

```
//“Mask number” command :
00 00 FF 02 FE D4 02 2A 00;
//Same command :
00 00 FF 02 FE
D4 02 2A 00;

//“APDU” command :
// InDataExchange - Tg = 1
40  01  00 01 02 03 04 05 06 07 08 09 "1234";
//Same command :
40  01  00 01 02 03 04 05 06 07 08 09 31 32 33 34;
```


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4.2 Comments

The comments begin after a "*" character or a "/" character.
When they are used, all characters after them are in green color.

```
//"Mask number" command :
00 00 FF 02 FE D4 02 2A 00;
*Same command :
00 00 FF 02 FE\ beginning of the command
D4 02 2A 00; * end of the command
```

4.3 Special commands line

Several commands can be used in the script file. Each command line is represented by a particular syntax that must be respected. In the script file, those commands are represented in red color.

".b;"
This command line allows to insert a breakpoint in the script file.

".rawdata;"
This command line allows to enable the "Raw Data" mode. (For more details, see the end of "Script Menu" description)

".apdu;"
This command line allows to enable the "APDU" mode. (For more details, see the end of "Script Menu" description)

".command;"
This command line allows to enable the "Command" mode. (For more details, see the end of "Script Menu" description)

".save;"
This command line allows to save the log file (output view) using the same name as the script file with a ".log" extension.

".loop;"
This command line allows to enable the loop mode.

".trace(on);"
This command line allows to enable the display in the output view. This functionality is enabled by default.

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".trace(off);"
This command line allows to disable all display in the output view.

".info;"
This command line allows to show the script file name, the date, the time and the number of loop executed.

".t(0);"
This command line allows to disable the delay between each command if it had been implemented in the delay options dialog box.

".t(xxx);"
This command line allows to fix a delay between each command to be sent. "xxx" is the delay value in Microsoft mSec. This delay is also available in the delay options dialog box.

".start_duration;"
This command allows to start a software counter to measure a time. It works with the "stop_duration" and the "display_duration" functions.

".stop_duration;"
This command allows to stop a software counter to measure a time. It works with the "start_duration" and the "display_duration" functions. The "start_duration" function must be used before it.

".display_duration;"
This command allows to display the time measured between a "start_duration" and a "stop-duration".

".clear;"
This command allows to clear the output view.

".config(code, code1, Buffer);"
This command is link dependent. Each type of reader (serial, USB, I^2C,PC/SC) implements several commands.

Serial reader: the command ".config(00, 115200);" allows to switch to a specific baud rate. In this case, the baud rate is 115200 bps. It can be modified by another valid baud rate.
USB reader: no specific command available.
I^2C reader: This command allows to read/write to a specific I^2C address.
- .config(0, 40, AA); : allows to write the (AA)h byte to the I^2C address (40)h.
- .config(1, 41); : allows to read the byte at the I^2C address (41)h
- .config(1, 41,AA); : allows to read the byte at the I^2C address (41)h. Then, the byte read is compared to (AA)h . If there is a difference, an error message is displayed in the output view.

PC/SC reader: no specific command available.

".escape(CTL_CODE, Buffer);"
This command is only available with a PC/SC device. It allows sending an IOCTL command to the PC/SC driver. The CTL_CODE is normally specified in the PC/SC driver documentation. The Buffer parameter is used to provide specific data to the PC/SC driver.

Opcodes and Error codes

Opcodes and error codes are different depending on the reader used.

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For example, in all ALPAR readers, the opcode is coded in the third byte. The explanation of all ALPAR opcodes is given in a text file, named command.txt. This file is also used to display the name of each command in the output view. If the command is wrong, the reader answers with an error code. All error codes are defined in the error.txt.
For a PC/SC reader, there is no opcode used, errors are provided by the Microsoft Smart Card Resource Manager.

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5. Commands description

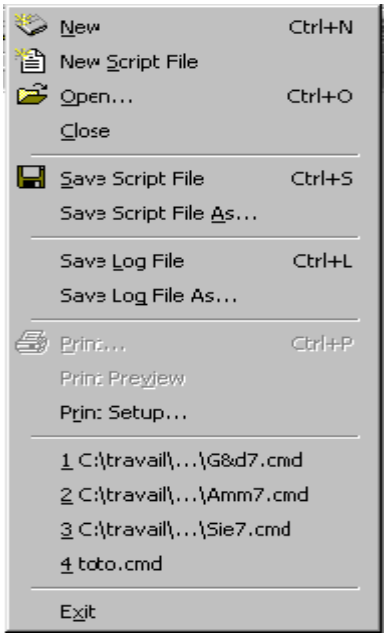
5.1 Menu

The following menu can be used:

- File Menu
- Edit Menu
- Script Menu
- Command Menu
- Protocol Menu
- Reader Menu
- View Menu
- Tools Menu
- Windows Menu
- Help Menu

5.1.1 File Menu

The File menu offers the following commands:



New Creates a new document (through Serial or USB link).

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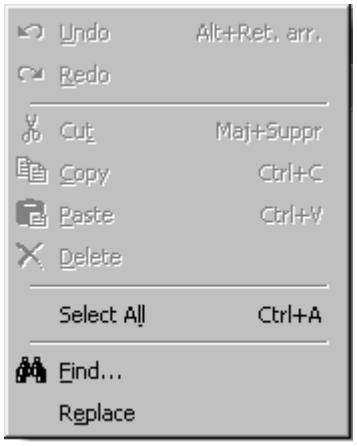
New Script File	Creates an empty document
Open	Opens an existing script File.
Close	Closes an opened document.
Save Script File	Saves an opened script using the same file name.
Save Script File As	Saves an opened script to a specified file name.
Save Log File	Saves the log file using the script file name
Save Log File As	Saves the log file to a specified file name
Print	Prints the log file View.
Print Preview	Displays the log file on the screen as it would appear printed.
Print Setup	Selects a printer and printer connexion.
Exit	Exits SCRTester

5.1.2 Edit Menu

The Edit menu offers the following commands:



Undo	Not implemented.
Redo	Not implemented.
Cut	Deletes data from the document and moves it to the clipboard.
Copy	Copies data from the document to the clipboard.
Paste	Pastes data from the clipboard into the document.
Delete	Deletes data.
Select All	Selects all data.
Find	Not implemented.
Replace	Not implemented.

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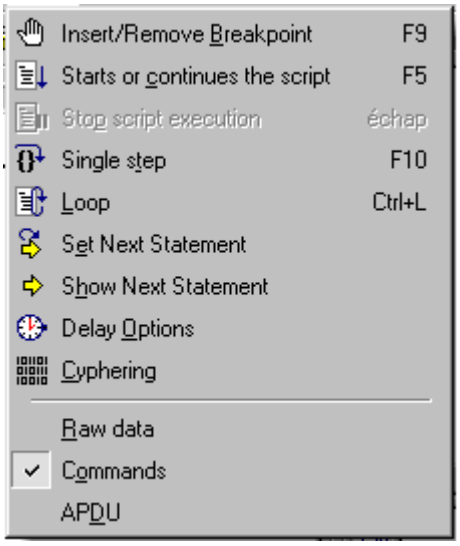
5.1.3 Script Menu

The Script menu offers the following commands:



- Insert/Remove BreakPoint :
  Inserts or removes the break point on the current script command.
  Shortcuts:
  Toolbar: 
  Keys: F9

- Starts or continues the script:
  Starts or continues the script execution.
  Shortcuts:
  Toolbar: 
  Keys: F5

- Stops script execution:
  Stops the script execution.
  Shortcuts:
  Toolbar: 
  Keys: Esc

- Single step:
  Executes the current command.
  Shortcuts:
  Toolbar: 
  Keys: F10

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- Loop:
  Activates the loop Mode.
  When the end of the script is reached, the script will continue from the beginning indefinitely.
  Shortcuts
  Toolbar: 
  Keys: **Ctrl+L**

- Set next statement:
  Selects the command where the cursor is.
  Shortcuts
  Toolbar: 
  Keys: Double Click on the command

- Show next statement:
  Not implemented.

- Delay Options:
  Shows the “Delay Options” dialog box.
  Shortcuts
  Toolbar: 
  Keys: Not implemented

- Cyphering:
  Shows the “cyphering” dialog box.

Shortcuts
Toolbar: 
Keys: Not implemented

- Raw Data:
  Selects the Raw data Mode.
  This mode allows to send the script commands without any protocol.
  Script data: 60 00 00 0A 6A --> data sent: 60 00 00 0A 6A

- Commands:
  Selects the command Mode.
  This mode allows sending the script commands with an encapsulation of the selected protocol.

  Script Data: 6E 00; --> data sent: 60 00 01 6E 00 0F
  ---- : Alpar Protocol encapsulation

- APDU:
  Selects the APDU Mode.
  This mode allows to send an APDU command with an encapsulation of the selected protocol and the APDU

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Opcode.

Script data: 00 00 B0 00 00 40; --> data sent: 60 00 05 00 00 B0 00 00 40 95
---- : Alpar Protocol encapsulation
---- : APDU Opcode (ALPAR Protocol)

5.1.4 Command Menu

The Command menu offers the following commands:

- Command setting: 

  Displays the “Command Setting“ dialog box to define an owner command.

- Command 1: - Keys: Ctrl+F1 - 

  Allows to send the predefined command in the Command Setting dialog box

- Command 2: - Keys: Ctrl+F2 - 

  Allows sending the predefined command in the Command Setting dialog box

- Command 3: - Keys: Ctrl+F3 - 

  Allows to send the predefined command in the Command Setting dialog box

- Command 4: - Keys: Ctrl+F4 - 

  Allows to send the predefined command in the Command Setting dialog box

- Command 5: - Keys: Ctrl+F5 - 

  Allows to send the predefined command in the Command Setting dialog box

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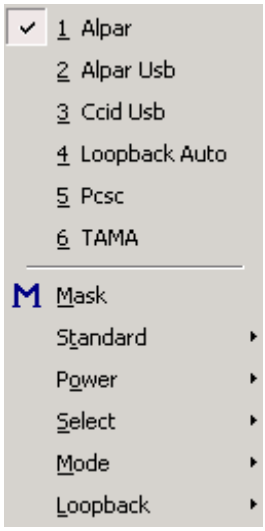
5.1.5 Protocol Menu

The Protocol menu offers the following commands:



- Alpar USB: Select this menu item to use the ALPAR USB protocol.
- Alpar: Select this menu item to use the ALPAR protocol.
- Mask: Sends the “Mask Number” command corresponding at the selected protocol. (See the demoboard application note).
- Standard: Use this popup menu to change the activation mode (ISO / EMV)
- Power: Use this popup menu to manage the power commands:
  - Asynchronous card:
    - Power Down.
    - Power Up 5V.
    - Power Up 3V.
  - Synchronous card:
    - I2C
    - S9
    - S10
    - Euro
    - Gpm: Fuse 0 (896)
    - Gpm: Fuse 1 (896)

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- Select: Use this popup menu to select a smart card (1 to 6)

- Mode: Use this popup menu to change the standard mode :
  Standard.
  ESM Char.
  ESM En_Req.

- Loopback: Use this popup menu to use the loopback functionality.
  Loopback EMV.
  Loopback GIE.

Rem: All protocols are managed dynamically by using a DLL.
Alpar USB Protocol: proAlparUSB.dll
Alpar Protocol: proAlpar.dll
TAMA protocol: proTAMA.dll

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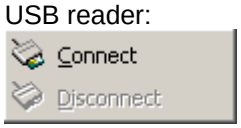
5.1.6 Reader Menu

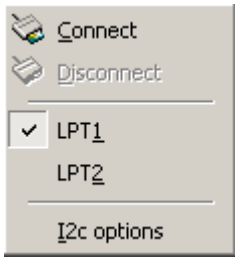
This menu gives you the possibility to set up the communication port (Serial, USB, I^2C, PC/SC).

USB reader:



Initiates or closes the communication with the USB device driver.

I2C reader:

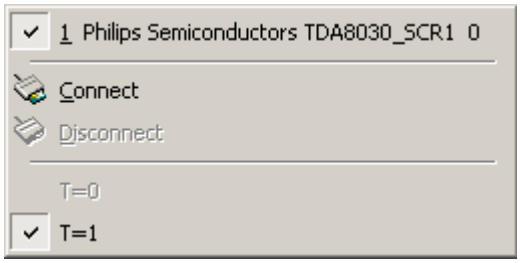


Connects the reader to the PC via the LPTx port management.

The I²C lines are emulated using the PC parallel pins.

The lines configuration ((SCL, SDA) can be set up using the I²C option menu.

PC/SC reader:



The reader menu of the PC/SC board allows the selection to the PC/SC reader. In fact, all PC/SC drivers loaded by the Microsoft Resource Manager are mentioned dynamically in the menu. The user selects the reader and the possible card protocol to use and initiate the communication by the “connect” menu.

When the reader is connected, the ATR of the card is displayed and decoded by SCRTester.

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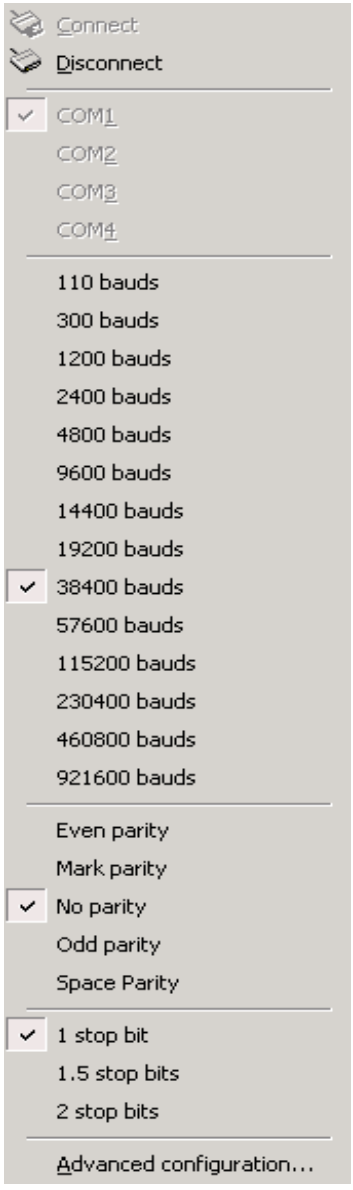
Serial menu:



The serial menu allows the user to select the communication parameters. See the application note of the reader used to know the parameters to be used.

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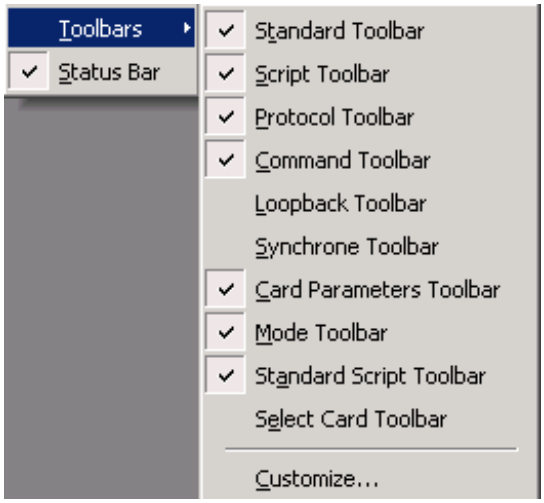
5.1.7 View Menu

The View menu offers the following commands:



Toolbar: Shows or hides the toolbar.

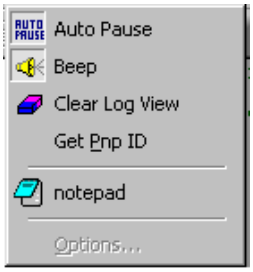
Use this command to display and hide the Toolbar, which includes buttons for some of the most common commands in SCRTester, such as File Open. A check mark appears next to the menu item when the Toolbar is displayed.

Status Bar: Shows or hides the status bar.

Use this command to display and hide the Status Bar.

5.1.8 Tools Menu

The Tools menu offers the following commands:



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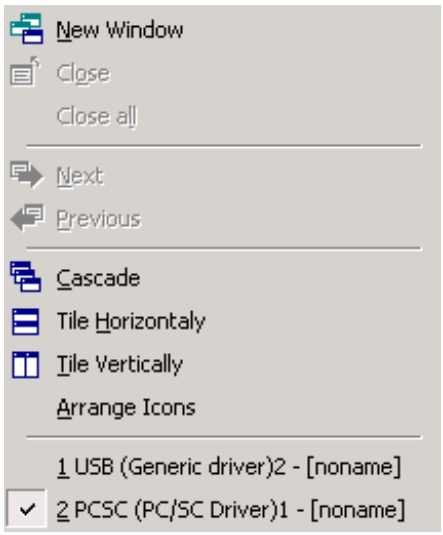
Auto Pause	Select this menu item to stop the script automatically on an error.
Beep	Select this menu item to hear a beep on an error.
Clear Log View	Clears the current output view.
Get Pnp ID	Generates a Plug and Play sequence on the current serial port.
Options…	Not implemented.

5.1.9 Windows Menu

The Window menu offers the following commands, which enable to arrange multiple views of multiple documents in the application window:



New Window: Creates a new window that views the same document.

Use this command to open a new window with the same contents as the active window. You can open multiple document windows to display different parts or views of a document at the same time. If you change the contents in one window, all other windows containing the same document reflect those changes. When you open a new window, it becomes the active window and is displayed on top of all other open windows.

Cascade: Arranges windows in an overlapped fashion.

Use this command to arrange multiple opened windows in an overlapped fashion.

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Tile: Arranges windows in non-overlapped tiles.

Use this command to arrange multiple opened windows in a non-overlapped fashion.

Arrange Icons: Arranges icons of closed windows.
Window 1, 2...: Goes to specified window.

5.1.10 Help Menu

The Help menu offers the following commands, which provide you assistance with this application:

Contents: Offers an index on topics on which you can get help.
About: Displays the version number of this application.

5.2 Toolbar

The toolbar is displayed across the top of the application window, below the menu bar. The toolbar provides quick mouse access to many tools used in SCRTester

To hide or display the Toolbar, choose Toolbar from the View menu.

Click To:

 Create a new device document.

 Create a new script file.

 Open a script file.

 Save the active script document with its current name.

 Remove selected data from the document and stores it on the clipboard.

 Copy the selection to the clipboard.

 Insert the contents of the clipboard at the insertion point.

 Print the active output document.

 Start/Continue the script execution.

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Execute the next script command.


Stop the current script execution.


Insert/Remove a breakpoint.


Enable the loop script mode.


Set Next Statement.


Display the “Delay options” dialog box.


Display the “Cyphering” dialog box. (internal use)


Send a “Mask Number” command.


Send a “Power OFF“ command.


Send a “Power ON 5V” command.
NOTE : If the selected reader is PC/SC, the activation will always be a WARM reset.


Send a “Power ON 3V” command.


Enable the EMV activation mode.


Enable the ISO activation mode.


Enable/Disable the Auto Pause Mode.


Enable/Disable the beep on error.


Clear all data in the output view.


Enable/Disable the ASCII/Hex display in the output view.


Allow reading or writing to the reader register.

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Enable the “Standard” Mode.

Enable the Enable-Request Energy Saving Mode.

Enable the Char Energy Saving Mode.

Start the EMV Loopback test mode.

Start the GIE Loopback test.

Display the “Command Setting” dialog box.

Send the command 1.

Send the command 2.

Send the command 3.

Send the command 4.

Send the command 5.

Send a “select card 1” command.

Send a “select card 2” command.

Send a “select card 3” command.

Send a “select card 4” command.

Send a “select card 5” command.

Send a “select card 6” command.

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Send a “Power Up I2C” command.

Send a “Power Up S9” command.

Send a “Power Up S10” command.

Send a “Power Up Euro” command.

Send a “Power Up Gpm 896 with Fuse 0” command.

Send a “Power Up Gpm 896 with Fuse 1” command.

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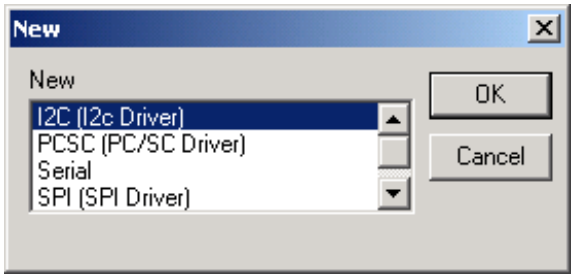
5.3 Specific use

5.3.1 New command (File menu)

Use this command to create a new device document in SCRTester. Select the link you want to create in the new dialog box.



Each device is managed dynamically by adding its DLL file. When the application starts, the DLL devices are loaded and usable.
If there is only one DLL device in your SCRTester application, for example a serial device (BrdSerial.dll), the device is created automatically without dialog box!

Thereafter, you can open an existing script file with the “Open” command.

Shortcuts

Toolbar: 
Keys: CTRL+N

5.3.2 Open command (File menu)

Use this command to open an existing script file in the current window.
You can create a new document with the “New” command.

Shortcuts

Toolbar: 
Keys: CTRL+O

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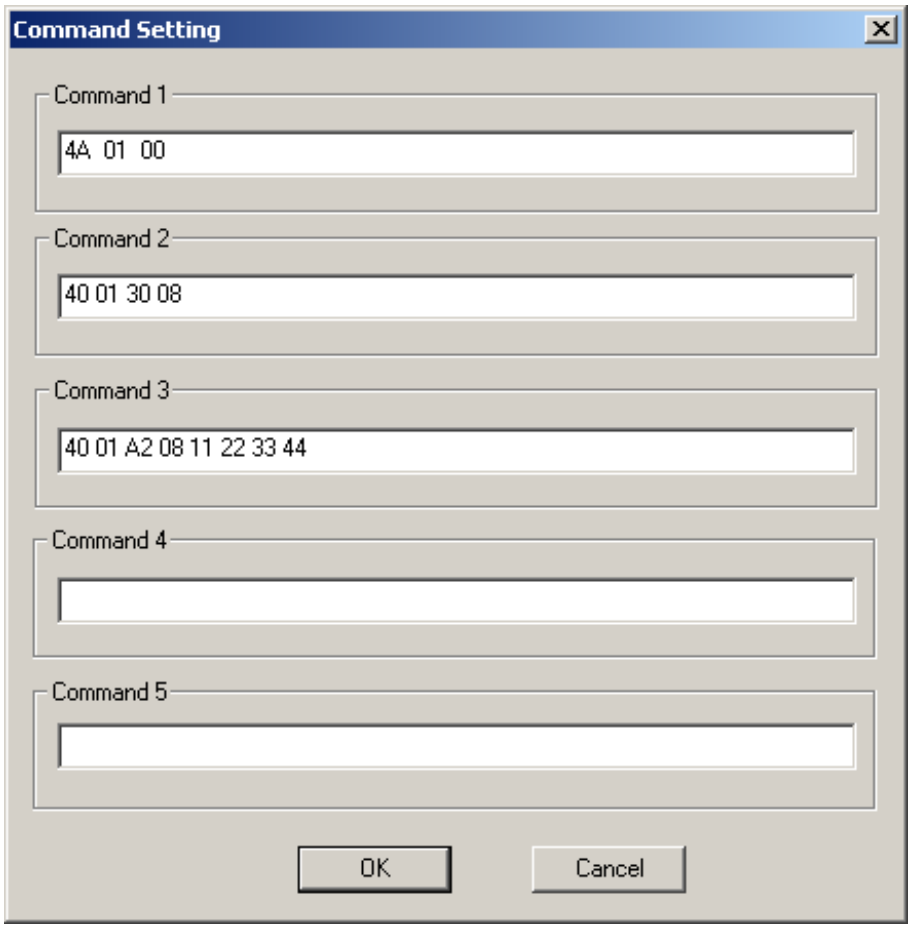
5.3.3 Command Setting Dialog Box



Use this dialog box to define 5 new commands that are usable from the menu “Command” or by its toolbar.

5.3.4 Alpar USB Protocol

This command is used to select the ALPAR USB Protocol. This protocol is made by Philips Semiconductors and is used to communicate with the USB smart card readers demo boards. For more details, see the demo board application note.

When the ALPAR USB Protocol is selected, all commands of this protocol are enabled and can be used. These commands are situated below the separator in the same menu and are described in the chapter named “Protocol Menu”.

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5.3.5 Alpar Protocol

This command is used to select the ALPAR Protocol. This protocol is made by Philips Semiconductors and is used to communicate with the SERIAL smart card readers demo boards. For more details, see the demo boards application note.

When the ALPAR Protocol is selected, all commands of this protocol are enabled and can be used. These commands are situated below the separator in the same menu and are described in the chapter named “Protocol Menu”.

5.3.6 PC/SC Protocol

This command is used to select the PC/SC Protocol. This protocol can be used with all PC/SC readers, which provide a PC/SC compliant driver. It must only be use with a PC/SC device created by the new command of SCRTester.

When the PC/SC Protocol is selected, all commands of this protocol are enabled and can be used. These commands are situated below the separator in the same menu.

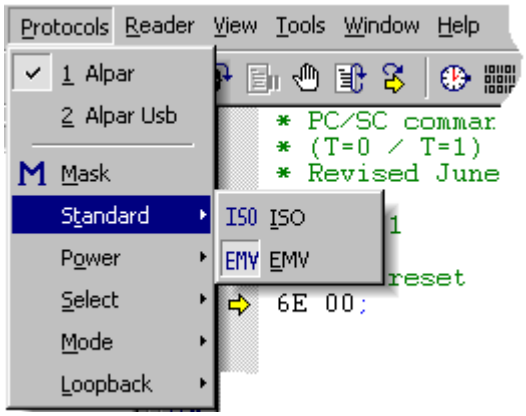
5.3.7 TAMA Protocol

This command is used to select the TAMA Protocol. This protocol is a proprietary protocol made by Sony and is used to communicate with the TAMA demo boards. For more details, see the demo boards application note.

When the TAMA Protocol is selected, all commands of this protocol are enabled and can be used. These commands are located below the separator in the same menu and are described in the chapter named “Protocol Menu”.

5.3.8 Standard Menu

For contact reader only.



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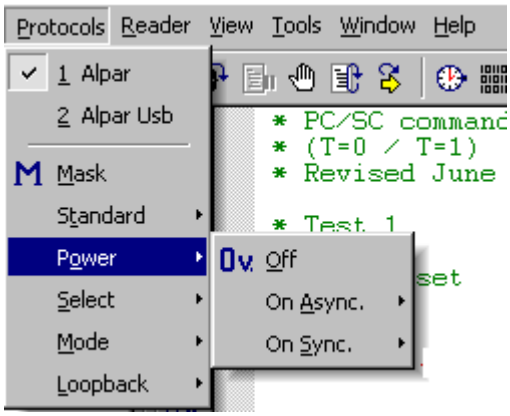
- **ISO:** Select this menu item to use the ISO activation mode.
  Shortcuts:
  Toolbar: 
  Keys: Not Used

- **EMV:** Select this menu item to use the EMV activation mode.
  Shortcuts:
  Toolbar: 
  Keys: Not used

5.3.9 Power Menu

For contact reader only.



- **Off**: Sends a Power off command.
  Shortcuts:
  Toolbar: 
  Keys: Not used

- **On Async**.: Use this popup menu to send a power up 5V or a power up command.

- **On Sync**.: Use this popup menu to send a synchronous power up command.

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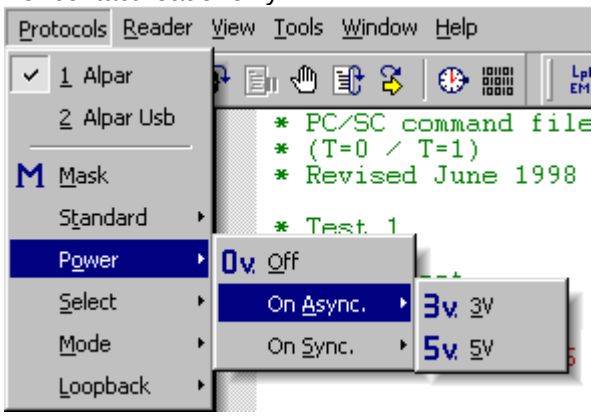
5.3.10 On Async. Menu

For contact reader only.



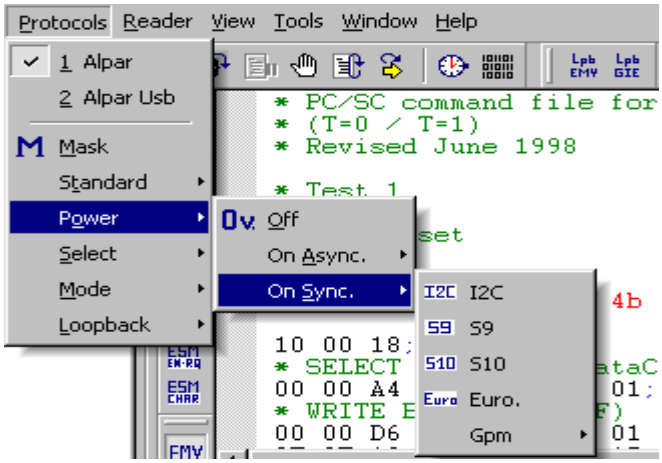
- **3V**: Sends a power up 3-volt command.
  Shortcuts:
  Toolbar: 3v
  Keys: Not used

- **5V**: Sends a power up 5-volt command.

NOTE: If the selected reader is PC/SC, the activation will always be a WARM reset.
Shortcuts:
Toolbar: 5v
Keys: Not used

5.3.11 On Sync. Menu

For contact reader only.



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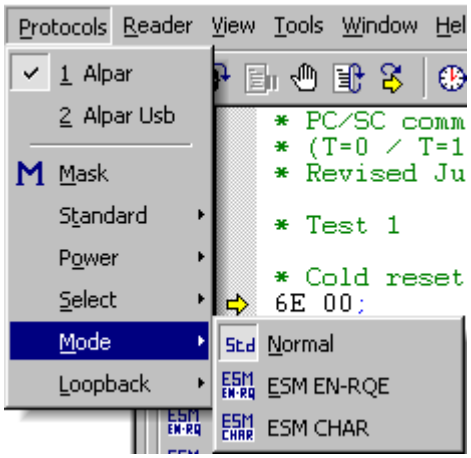
I2C:	Sends a power up command for an I2C smart card.	
S9:	Sends a power up command for an S9 smart card.	
S10:	Sends a power up command for an S10 smart card.	
Euro.:	Sends a power up command for an Euro ship smart card.	
Gpm: Fuse 0:	Sends a power up command for a Gpm 896 smart card with fuse blown.	
Gpm: Fuse 1:	Sends a power up command for a Gpm 896 smart card with fuse not blown.	

5.3.12 Mode Menu



- **Standard**: Select this menu item to use the Standard Mode. This mode must be used for all demo boards that do not support the ESM Mode (ESM = Energy Saving Mode: see the demo board application note for more details).

  Shortcuts:

  Toolbar: 

  Keys: Not used

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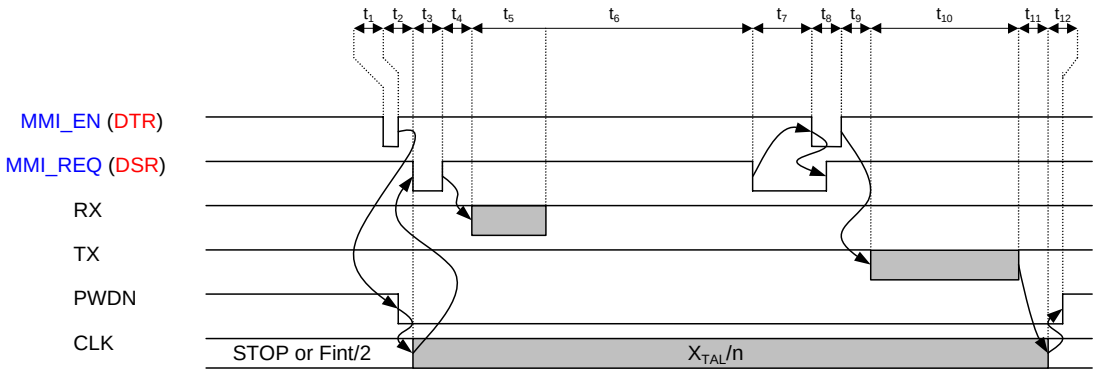
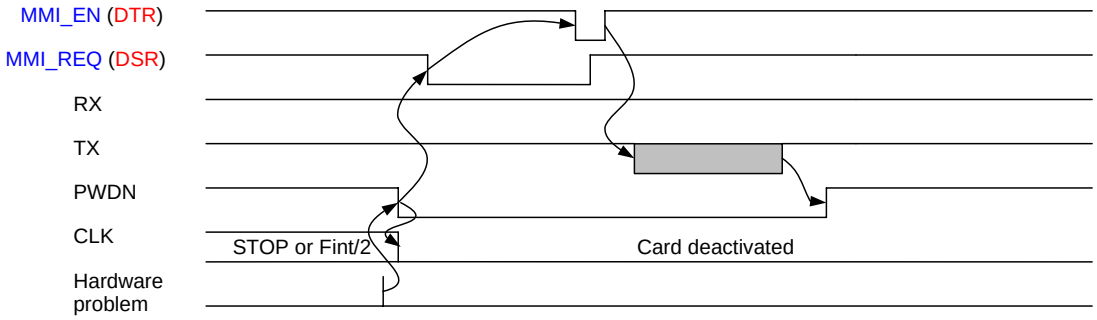
- **ESM EN_REQ**: Contact reader

Select this menu item to use the Enable-Request Energy Saving Mode.
In this mode, outside an exchange of commands between the host (PC) and the demo board, the card clock is either switched off (level high or low) or set to Fint/2 depending on the clock stop mode described in its ATR. If the card does not support the clock stop mode or does not specify it, the clock is set to Fint/2.
Just after having changed the card clock, the demo board micro controller puts itself in power down mode.
A low level pulse on MMI_EN - DTR or any card event (extraction or insertion, over current on VCC or RST, overheating) will wake it up.



Communication initiated by the PC.



Communication initiated by the DemoBoard.

---- : demoboard signal
---- : PC signal

Shortcuts:

Toolbar: 

Keys: Not used

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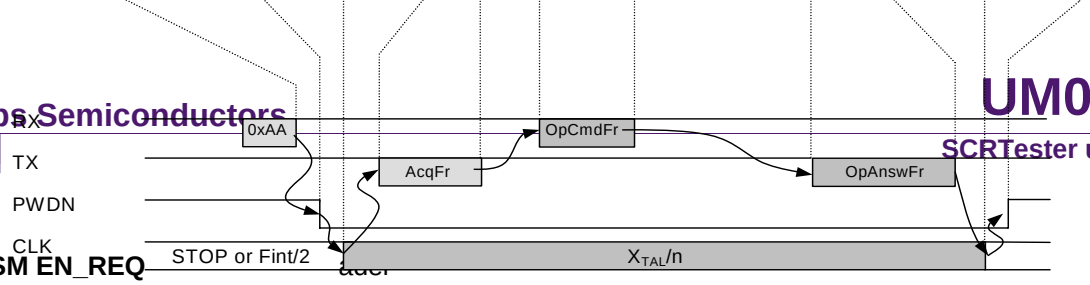
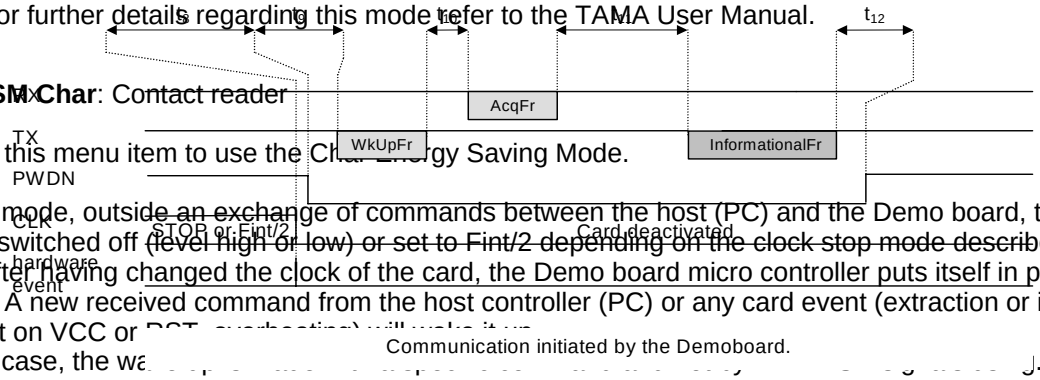


Communication initiated by the PC.

- **ESM EN_REQ**

  When using SCRTester with TAMA Readers, this menu allows using the Enable-Request Energy Saving Mode.

  For further details regarding this mode refer to the TAMA User Manual.



Communication initiated by the Demoboard.

- **ESM Char**: Contact reader

Select this menu item to use the Char. Energy Saving Mode.

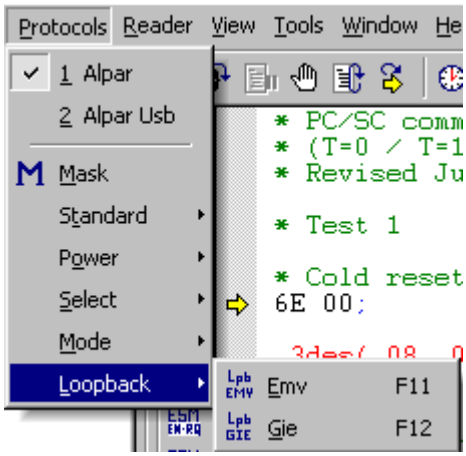
In this mode, outside an exchange of commands between the host (PC) and the Demo board, the card clock is either switched off (level high or low) or set to Fint/2 depending on the clock stop mode described in its ATR. Just after having changed the clock of the card, the Demo board micro controller puts itself in power down mode. A new received command from the host controller (PC) or any card event (extraction or insertion, over current on VCC or RST, overheating) will wake it up.
In this case, the wa[illegible] mode.

Shortcuts:

Toolbar: ESM CHAR

Keys: Not used

5.3.13 Loopback Menu



- **EMV**: Starts or stops the Loopback EMV test. This test is necessary for an EMV certification.
  The test is finished either when the message “LOOPBACK : TEST OK” is displayed or when an error is returned.

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Shortcuts:

Toolbar: 

Keys: F10

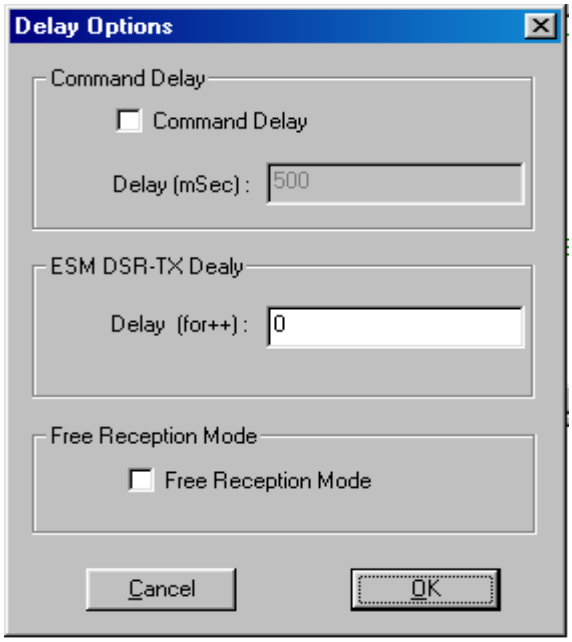
- **GIE**: Starts or stops the Loopback GIE test. This test is necessary for an GIE certification. The test is finished either when the message “LOOPBACK : TEST OK” is displayed or when an error is returned.

  Shortcuts:

  Toolbar: 

  Keys: F11

5.3.14 Delay Options



This Dialog box allows changing several communication parameters. The first one, named “Command delay”, is used to put a delay in milliseconds between each script command sent. The second one and the last one are reserved for internal use.

5.3.15 Cyphering

Reserved for internal use!

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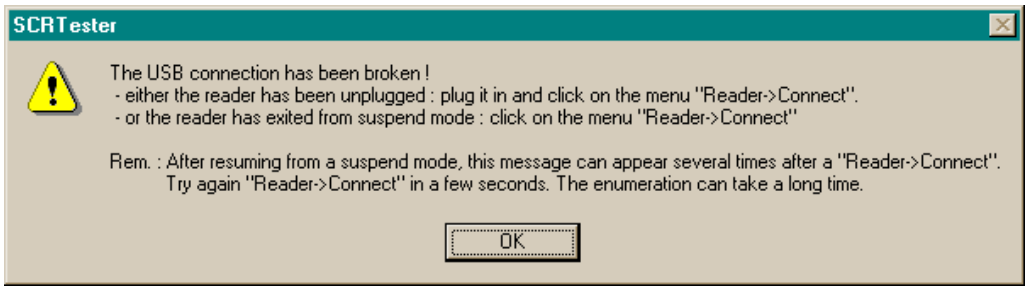
6. Specific USB behaviour

6.1 Active suspend and remote wake up

SCRTester supports the active suspend mode and the remote wake up. When the device works, for example in loop mode, you can go to the suspend mode. To wake up the PC, extract or insert the smart card.

After the wake up, the following message appears:



As explained in this message, to restart the script execution after resuming from the suspend mode, you have to reconnect the reader by using the “Reader : Connect” menu item. Then you will be able to start the script execution as explained in the script use part.

If you have several hubs and USB devices on the same host controller, the enumeration can take a long time. You have to try again this procedure in a few seconds if the message reappears.

6.2 Hot detach and reattach

The hot detach and reattach is supported by the system. If the hot detach is performed during the script execution, the message above appears. After the reattach, you have to connect the software by the “reader-connect” menu item.

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