ReadMe PN531 C2 Design-in Kit

PN531 C2 design-in kit, quick start guide

Rev. 1.3 — 2006-02-03   ReadMe

Semiconductors

Document information

Info	Content
Keywords	NFC, PN531 C2, Demo board
Abstract	Quick start guide for PN531 C2 design-in kit

PHILIPS

Revision history

Rev	Date	Description
0.1	04/06/15	Initial release
1.0	04/08/17	Adding TamaWebLink application
1.1	04/11/30	TAMA V3.3 version
1.2	05/04/04	TAMA V3.4 version
1.3	06/01/16	New USB driver for PN531 C2

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1. Contents

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2. INTRODUCTION

Note: The current demo package is meant for PN531 with firmware version 4.2.
This IC is in status IC Released. The embedded firmware is described in the User Manual document "UM0501-02.pdf".
Basically, it supports Mifare Standard and UltraLight cards but also peer-to-peer passive communication mode (initiator and target) according NFC Data Exchange protocol.

3. DEMO KIT CONTENTS

The PN531 Demo Kit consists of the following:

- one PN531_HSU demo board,
- one PN531_USB demo board,
- Mifare UltraLight cards,
- Mifare Standard cards,
- a CD containing all the documentation,
- Power supply for HSU demo board,
- Serial RS232 cable,
- USB cable.

4. CD CONTENTS

1. **"%CDROM% \"** directory

The document ReadMe PN531 C2 kit V1.3.pdf is a read me file on the demo package.

2. **"%CDROM% \ Documentation"** directory

The document PN531_SF_2.0.pdf is a short form of PN531 Objective Specification.
The document UM0501-02.pdf describes the firmware functionality embedded in the PN531 IC chip.
The document AN10394-04.pdf is the PN531 C2 application note.
The document AN10287-04.pdf describes both the PN531_HSU and PN531_USB demo board.
The directory PCB1643-1 contains all the electrical, layout files of the PN531_HSU demo board.
The directory PCB 1648-1 contains all the electrical, layout files of the PN531_USB demo board.

3. **"%CDROM% \ PC software"** directory

The directory USB driver contains PN531 Windows device driver for the USB demoboard.

The directory SCRTester contains the SCRTester PC software program as well as its related documentation.

The directory Scripts contains the command files to be used with SCRTester.

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5. SCRTESTER TOOLS

5.1 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.

In case you are installing the PN531 USB driver for the first time, start the procedure from point 6.

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
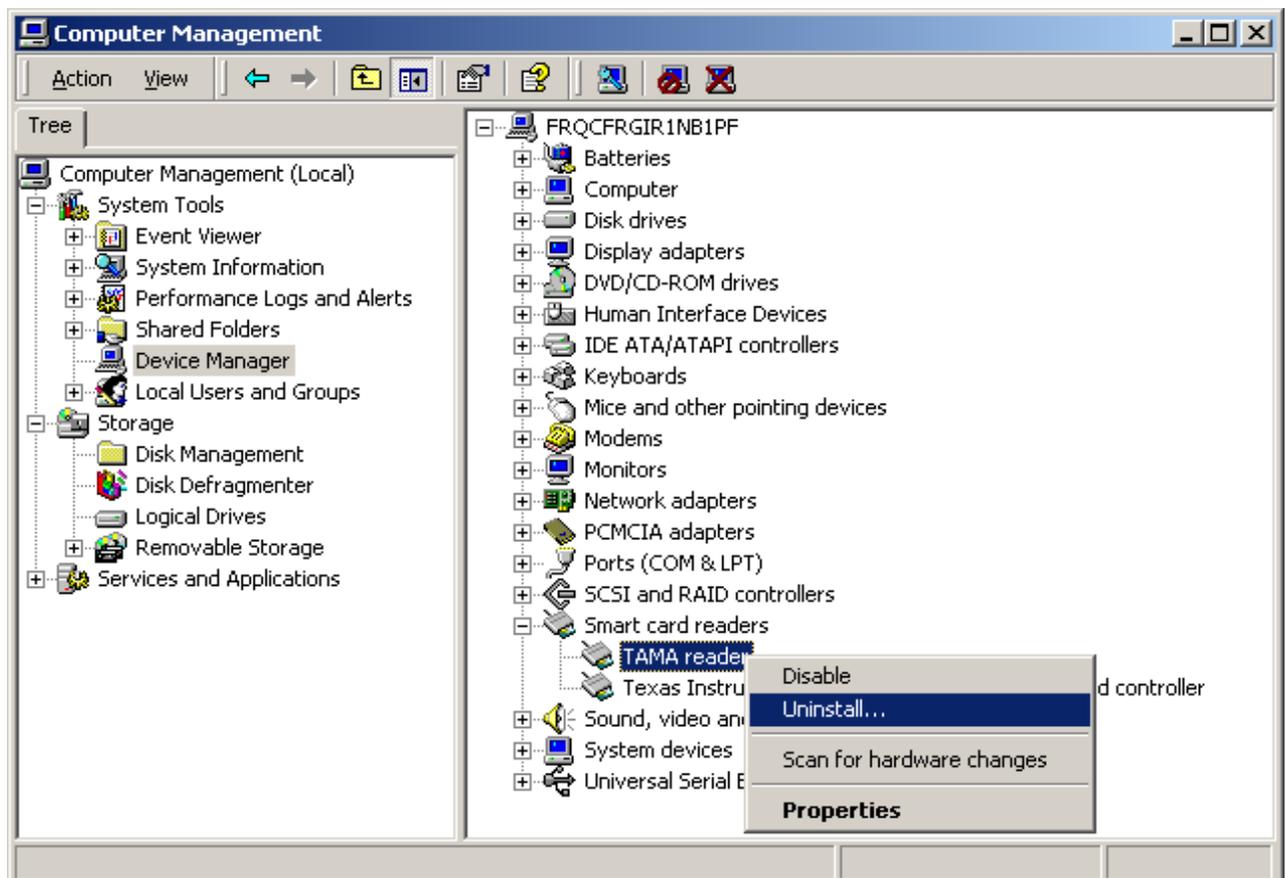
The following message should appear:

Press OK button to start the uninstall procedure

3) Unplug TAMA board

4) Under WindowsXP operating system:
    Delete file "C:\WINDOWS\system32\drivers\USB_Test.sys"

5) Under Windows2000 operating system:
    Delete file "C:\WINNT\system32\drivers\USB_Test.sys"
    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.

6)   Install SCRTester using the installshield file "SCRTesterV1620_Full_TamaUSB.exe".

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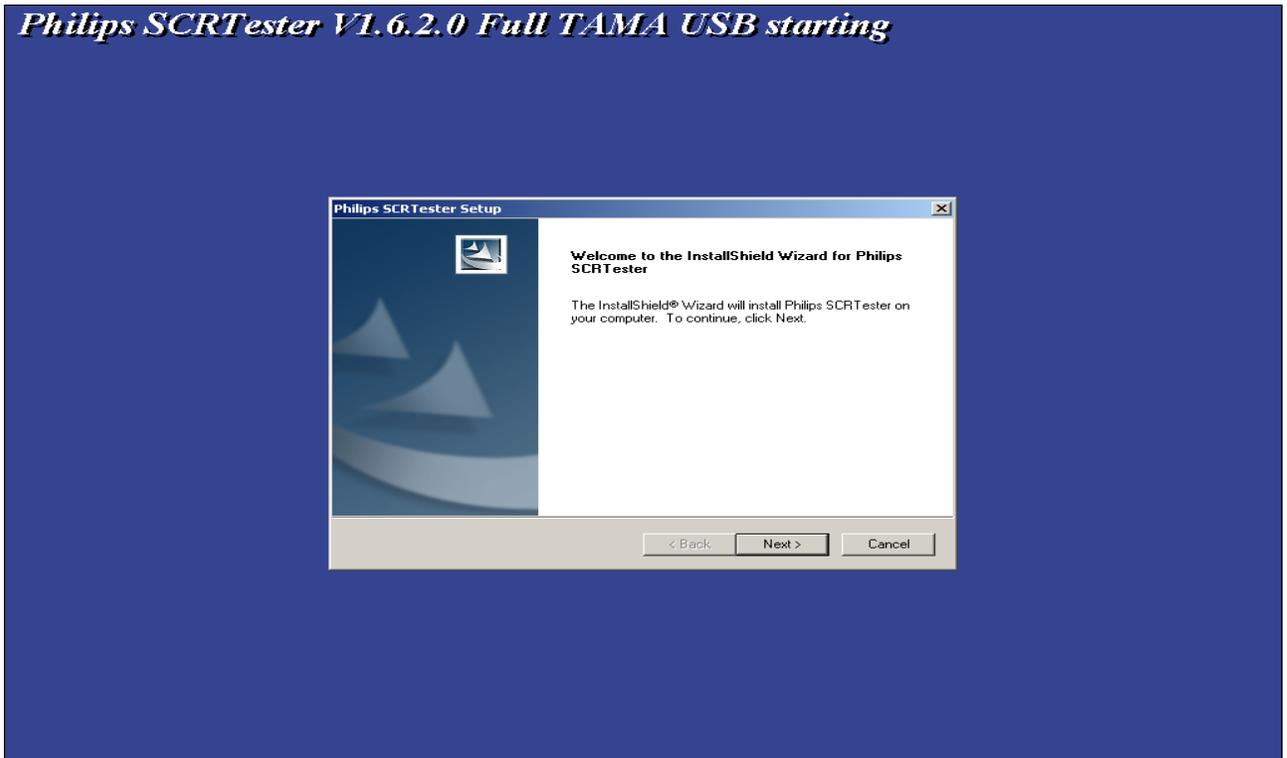
Proceed with "Next" button.
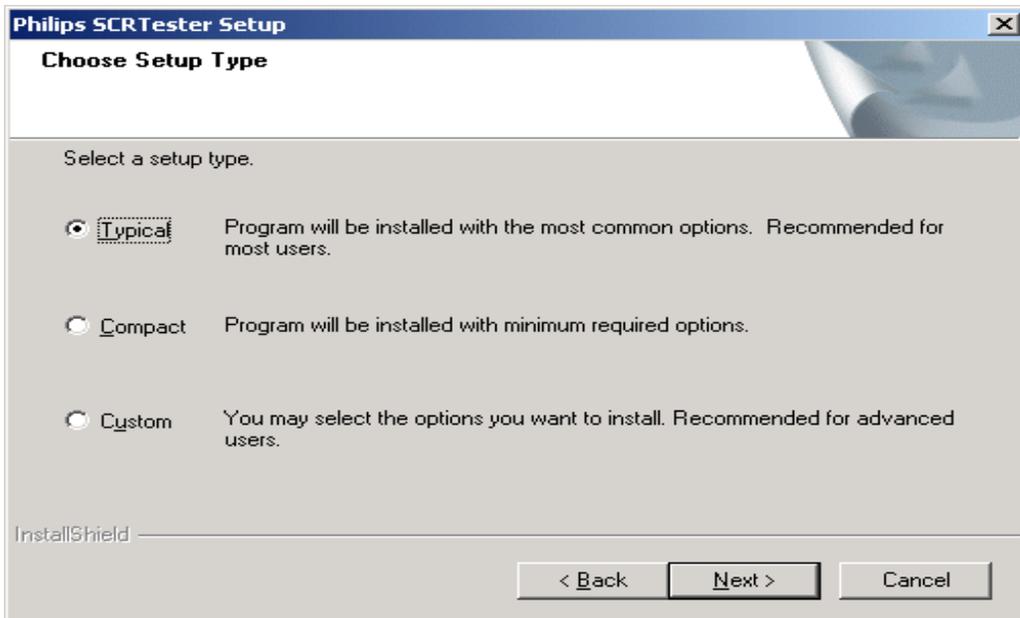
Select typical installation and proceed with "Next" button.
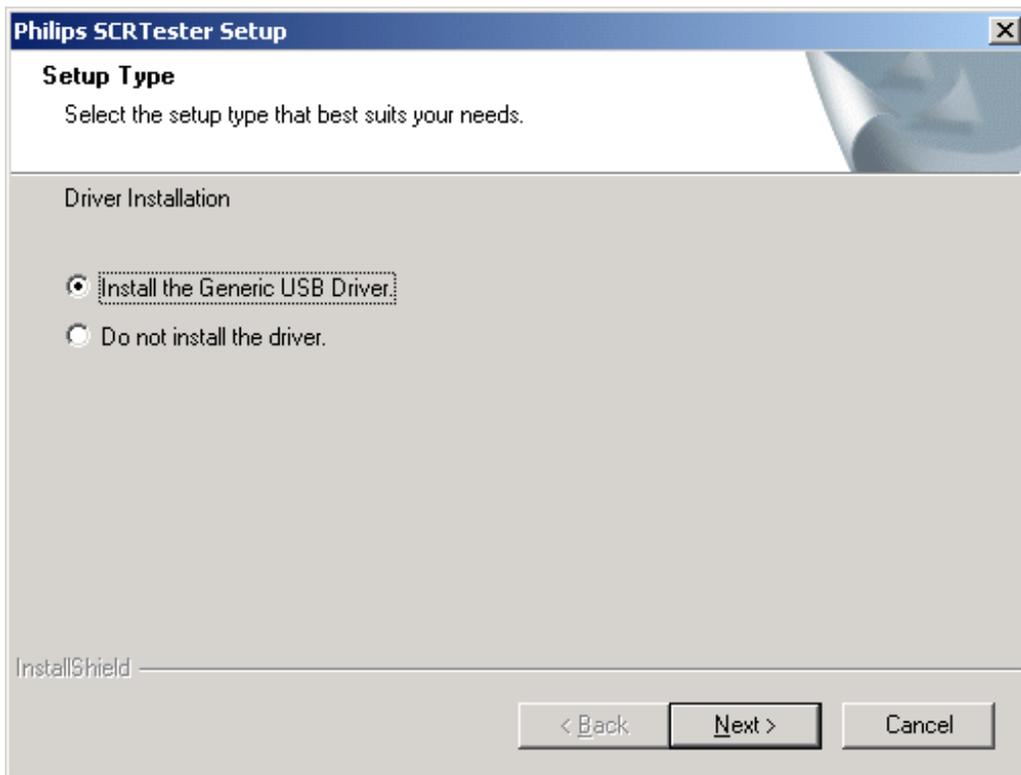
Install the generic USB driver.

Connect the USB demo board then proceed with the *Next* button.
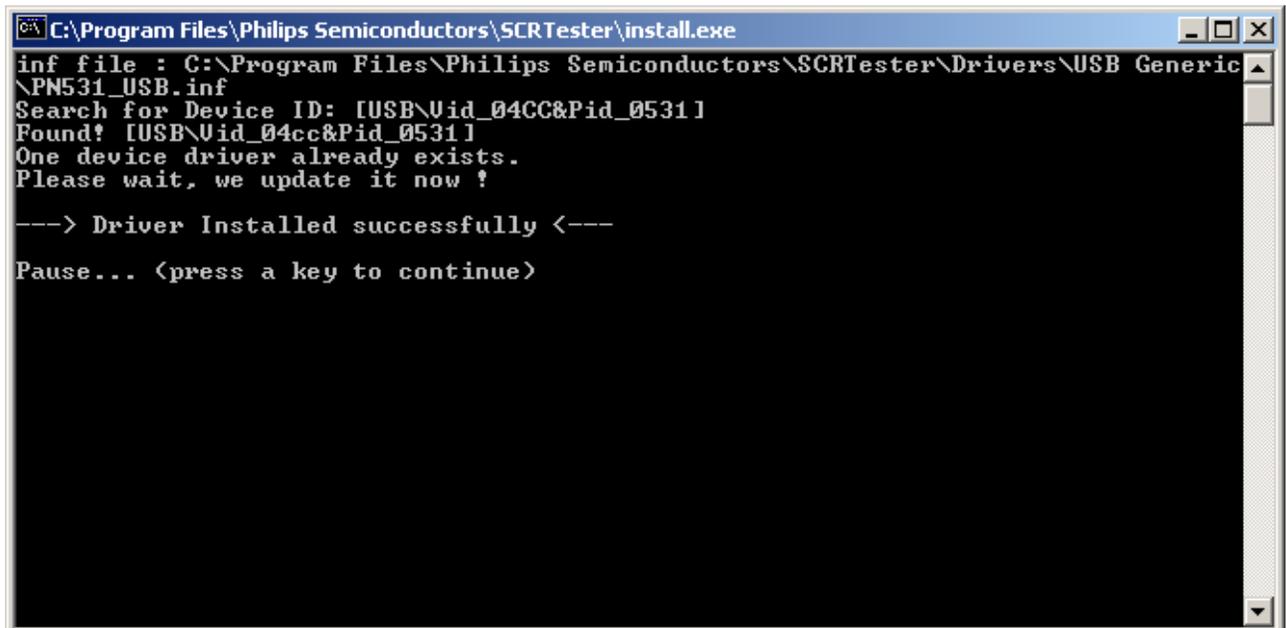
If you have a look at the Windows Device Manager, the PN531 reader will be enumerated as below.
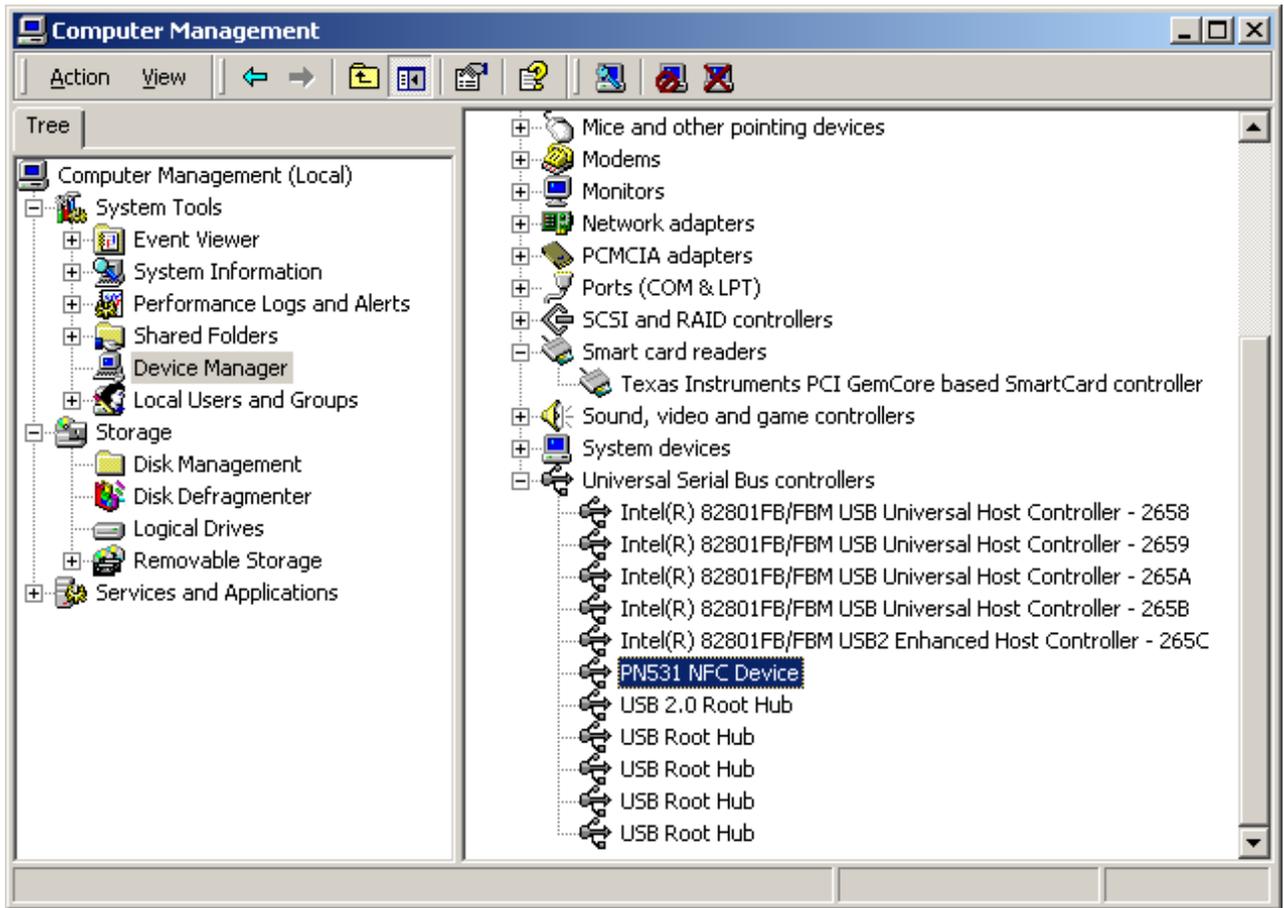
5.2 SCRTester application FOR USB DEMO READER

Launch SCRTester application and click on the *Connect* item from the *Reader* menu.

```
SCRTester 1.6.2.0 - [USB (Specific PN531 driver)1 - [Mifare UL.cmd]]
File  Edit  Script  Command  Protocols  Reader  View  Tools  Window  Help

ATR :
    no data
    Mask : Release R2

    02;                                    // Get firmware version

    // 3 - Mifare UltraLight @ 106bps
    //     --------------------------
    4A   01   00;                          // 1 target requested

    // Clear memory from address 0x04
    40 01 A2 04 00 00 00 00;               // Write 4 bytes from address 0x04
    40 01 A2 05 00 00 00 00;               // Write 4 bytes from address 0x05
    40 01 A2 06 00 00 00 00;               // Write 4 bytes from address 0x06
    40 01 A2 07 00 00 00 00;               // Write 4 bytes from address 0x07
    40 01 A2 08 00 00 00 00;               // Write 4 bytes from address 0x08
    40 01 A2 09 00 00 00 00;               // Write 4 bytes from address 0x09
    40 01 A2 0A 00 00 00 00;               // Write 4 bytes from address 0x0A
    40 01 A2 0B 00 00 00 00;               // Write 4 bytes from address 0x0B
    40 01 A2 0C 00 00 00 00;               // Write 4 bytes from address 0x0C

PC -> IFD : MASK NUMBER
            00 00 FF 02 FE D4 02 2A 00
IFD -> PC : ACK
            00 00 FF 00 FF 00
IFD -> PC : MASK NUMBER EXECUTED
            00 00 FF 04 FC D5 03 04 02 22 00

Ready                                                                    NUM
```

More details on SCRTester can be found in the SCRTester User Manual UM0201-05.pdf.

**Hint**: try the Mask command from Protocols menu to get the firmware version embedded in PN531 IC chip.
In case the reader returns a valid answer, this means the demo board is ready to operate and settings between SCRTester and the demo board are correct.

5.3 SCRTester application FOR SERIAL DEMO READER

SCRTester will automatically start with the USB configuration the first time it is launched.

To configure SCRTester for a serial demo reader, follow the following steps:

Choose the *New* item from File menu.
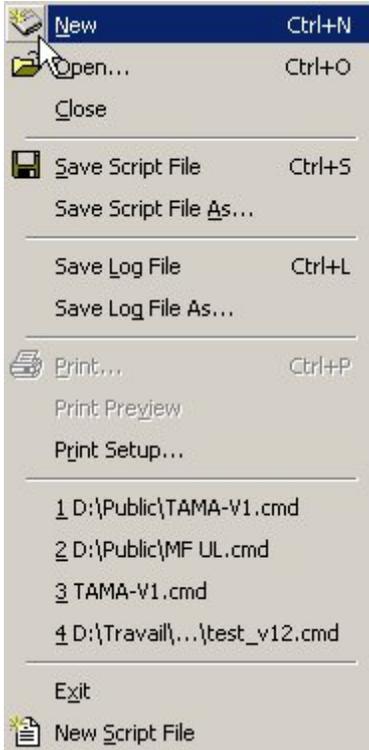
Select Serial and click on the *OK* button.
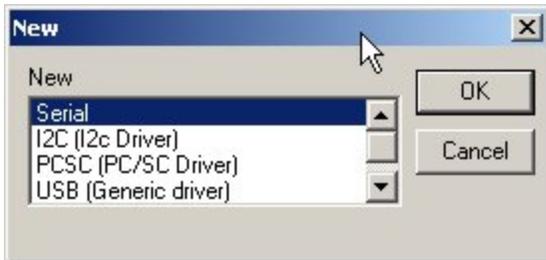
Choose the *Commands* item from the Script menu.

✋	Insert/Remove Breakpoint	F9
	Starts or continues the script	F5
	Stop script execution	Echap
	Single step	F10
	Loop	
	Set Next Statement	
⇨	Show Next Statement	
🕒	Delay Options	
	Cyphering	
✓	Raw data	
	Commands	
	APDU	
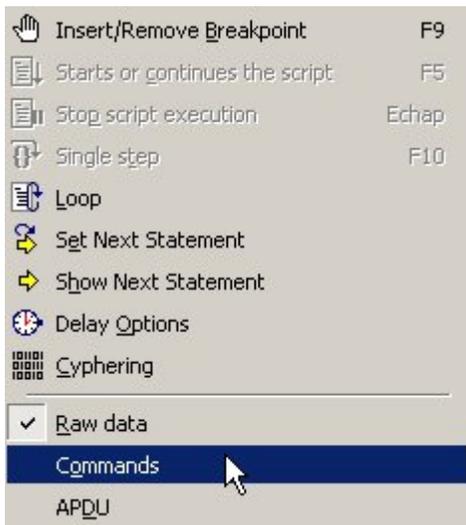
Choose the *TAMA* item from the Protocols menu.

1	Loopback Auto
2	Alpar
3	**TAMA**
4	Wcsc
5	Alpar Usb
6	Ccid Usb
	No availables commands

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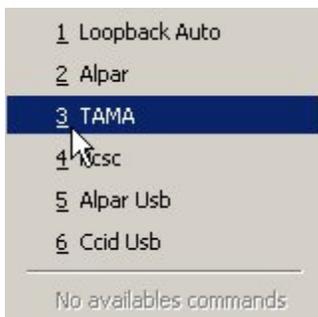
Configure the serial port settings from the *Reader* menu with the correct COM port as following:

```
Connect
Disconnect
─────────────────
  COM1
✓ COM2
  COM3
  COM4
─────────────────
  110 bauds
  300 bauds
  1200 bauds
  2400 bauds
  4800 bauds
✓ 9600 bauds
  14400 bauds
  19200 bauds
  38400 bauds
  57600 bauds
  115200 bauds
  230400 bauds
  460800 bauds
  921600 bauds
─────────────────
  Even parity
  Mark parity
✓ No parity
  Odd parity
  Space Parity
─────────────────
✓ 1 stop bit
  1.5 stop bits
  2 stop bits
─────────────────
  Advanced configuration…
```
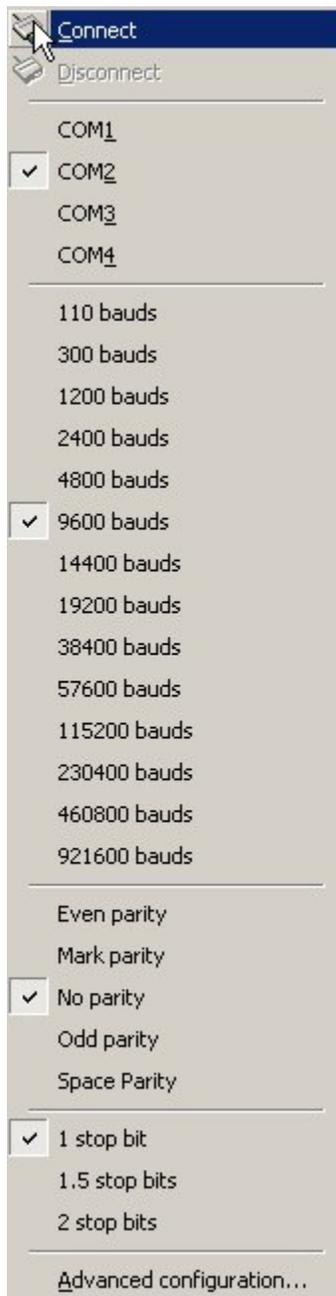
And finally select the *Connect* item.

For more information regarding SCRTESTER, please refer to UM0201-05.pdf documentation.

Hint: try the Mask command from Protocols menu to get the firmware version embedded in PN531 IC chip.
In case the reader returns a valid answer, this means the demo board is ready to operate and settings between SCRTester and the demo board are correct.

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