



# User Manual

**IDENTIVE Technologies AG**

## **PRODUCT TEST TOOL**

Multi-x, AxxB, AxxL - Series

**Contact:**

[www.identive-technologies.com](http://www.identive-technologies.com)

[www.identive-group.com](http://www.identive-group.com)

[support@identive-technologies.com](mailto:support@identive-technologies.com)

**Product Name:** Multi-x, AxxB, AxxL - Series

**Document:** Product Test Tool User Manual

**Current Version:** 1.6

**Document History:**

Revision	Date	Author	Description
1.0	2011.06.03	Arun Varma M	First published version
1.1	2011.06.09	Thillai Elayaraja S	<ul style="list-style-type: none"><li>- Changed the name as "User Manual"</li><li>- Update the Abbreviations &amp; Conventions section</li><li>- Included a section to describe Mj &amp; Mi edit-box</li><li>- General change to improve clarity</li></ul>
1.2	2011.07.29	Thillai Elayaraja S	<ul style="list-style-type: none"><li>- Updated the Limitations</li></ul>
1.3	2012.05.04	Thillai Elayaraja S	<ul style="list-style-type: none"><li>- Insignificant (Logo &amp; template changed)</li></ul>
1.4	2013.07.24	Thillai Elayaraja S Timo Baur	<ul style="list-style-type: none"><li>- Updated application screenshots</li><li>- Added screenshot for no tag on CCID reader</li><li>- Updated PTTlog.txt example</li><li>- Added "Note" (5.1)</li><li>- Added reader part numbers (3)</li><li>- Added images for test PASS &amp; FAIL</li></ul>
1.5	2013.11.08	Thillai Elayaraja S Timo Baur	<ul style="list-style-type: none"><li>- Added LEGIC reader (3)</li><li>- Added info about duration for reader scan (4.1)</li><li>- Added tag present info for CCID reader (5.1)</li><li>- Added note about UID read with DESFire (5.3)</li><li>- Added info about min. version to retrieve FW (5.3)</li><li>- Updated screenshots</li></ul>
1.6	2013.11.20	Timo Baur	<ul style="list-style-type: none"><li>- Added "AxxL" to document title</li><li>- Added LED behavior for AxxL / AxxB (6)</li></ul>

## Contents

<b>1</b>	<b>Description .....</b>	<b>4</b>
<b>2</b>	<b>Abbreviations &amp; Conventions .....</b>	<b>4</b>
2.1	<i>Abbreviations .....</i>	<i>4</i>
2.2	<i>Conventions .....</i>	<i>4</i>
2.3	<i>Document information .....</i>	<i>4</i>
<b>3</b>	<b>About Product Test Tool.....</b>	<b>5</b>
<b>4</b>	<b>Product Test Tool.....</b>	<b>6</b>
4.1	<i>Starting the tool.....</i>	<i>6</i>
4.2	<i>About the dialogue fields.....</i>	<i>6</i>
4.3	<i>Running more than one instance of the tool .....</i>	<i>7</i>
4.4	<i>Closing the tool .....</i>	<i>7</i>
<b>5</b>	<b>Testing Readers .....</b>	<b>7</b>
5.1	<i>To test a reader.....</i>	<i>7</i>
5.2	<i>Entering the firmware version in the Mj &amp; Mi edit-boxes .....</i>	<i>8</i>
5.3	<i>Test results .....</i>	<i>8</i>
<b>6</b>	<b>LED behavior .....</b>	<b>9</b>
6.1	<i>NFC Desktop Reader ADRB &amp; ADRBv2 .....</i>	<i>9</i>
6.2	<i>LEGIC Reader AxxL.....</i>	<i>9</i>
<b>7</b>	<b>Reader Scan .....</b>	<b>10</b>
<b>8</b>	<b>LogPTT.txt file .....</b>	<b>10</b>
<b>9</b>	<b>Limitations .....</b>	<b>10</b>
<b>10</b>	<b>Screenshots of various test cases.....</b>	<b>11</b>
10.1	<i>No readers are connected / detected .....</i>	<i>11</i>
10.2	<i>Testing a reader with default test cases .....</i>	<i>12</i>
10.3	<i>When FW versions do not match.....</i>	<i>13</i>
10.4	<i>Test with write and read case enabled .....</i>	<i>14</i>
10.5	<i>When card is not placed/detected, card not supported by the reader or the reader was unplugged from host after reader scan .....</i>	<i>16</i>

# 1 Description

## About this document

This document will help you to work with Product Test Tool application. Details about the supported reader types and card types are given.

# 2 Abbreviations & Conventions

## 2.1 Abbreviations

CCID	Chip Card Interface Device
FW	Firmware
HID	Human Interface Device
ISO	International Standard Organization
LED	Light Emitting Diode
MIFARE® UL	MIFARE® Ultralight
NFC	Near Field Communication
PC/SC	Personal Computer/Smart Card
PO	Purchase Order
PSN	Product serial number
PTT	Product Test Tool
RS232	Recommended Standard 232 (Serial communication standard)
UID	Unique Identification number
USB	Universal Serial Bus
VCP	Virtual COM Port

## 2.2 Conventions

Mj	Major version
Mi	Minor version
Ver	Version
'1234'	ASCII notation. '1234' (= 0x31 0x32 0x33 0x34)
A3(h)	Hex notation. e.g.: A3(h) = A3 in hexadecimal
163(d)	Decimal notation. e.g.: 163(d) = 163 in decimal
Esc	Escape key on the keyboard
Tab	Tabulator key on the keyboard
Alt	Alternate function key on the keyboard
AxxB	Identive NFC reader series with NXP PN532
AxxL	Identive LEGIC reader series
Multi-x	Multi-ISO or Multi-Slot reader series

## 2.3 Document information

Info	Content
Keywords	Product Test Tool, Help
Abstract	This document describes how to use the Product Test Tool

### 3 About Product Test Tool

**Product Test Tool.exe** is a diluted testing application for Identive Technologies' readers. It can be used for testing the following readers:

Readers	Reader types <sup>1)</sup>	Reader part numbers
Multi-ISO & Multi-Slot reader – USB	Multi x Series – USB	AMID2US00 AMID2US00-KBD AMIM2US00 AMIM2US00-KBD
Multi-ISO & Multi-Slot reader – Serial (RS232)	Multi x Series – Serial	AMID23205 AMIM23205
NFC reader – USB (with PCSC driver)	NFC – USB (PC/SC)	AxxB2US00 ADRB-USB ADRB-USB-V2 with PC/SC driver installed
NFC reader – Serial (Virtual COM / RS232 / UART)	NFC – Serial (Virtual COM / RS232) <sup>2)</sup>	AxxB2US00 <sup>3)</sup> ADRB-USB ADRB-USB-V2 AxxB23205 <sup>3)</sup> AxxB2UA33 <sup>3)</sup> AxxB2UA05 <sup>3)</sup>
LEGIC reader – Serial (Virtual COM / RS232)	LEGIC – Serial (Virtual COM / RS232)	ADRL-USB APDL-USB-42 APDL-USB-45

**Note:**

- 1) These are the reader types that are displayed in the GUI
- 2) Only NFC readers with microcontroller can be tested.
- 3) replace “xx” with  
 “PP” (Plug & Play module),  
 “PD” (Mobile Module),  
 “CM” (Core Module) and  
 “VM” (Vending Machine Kit).

This application tests the following:

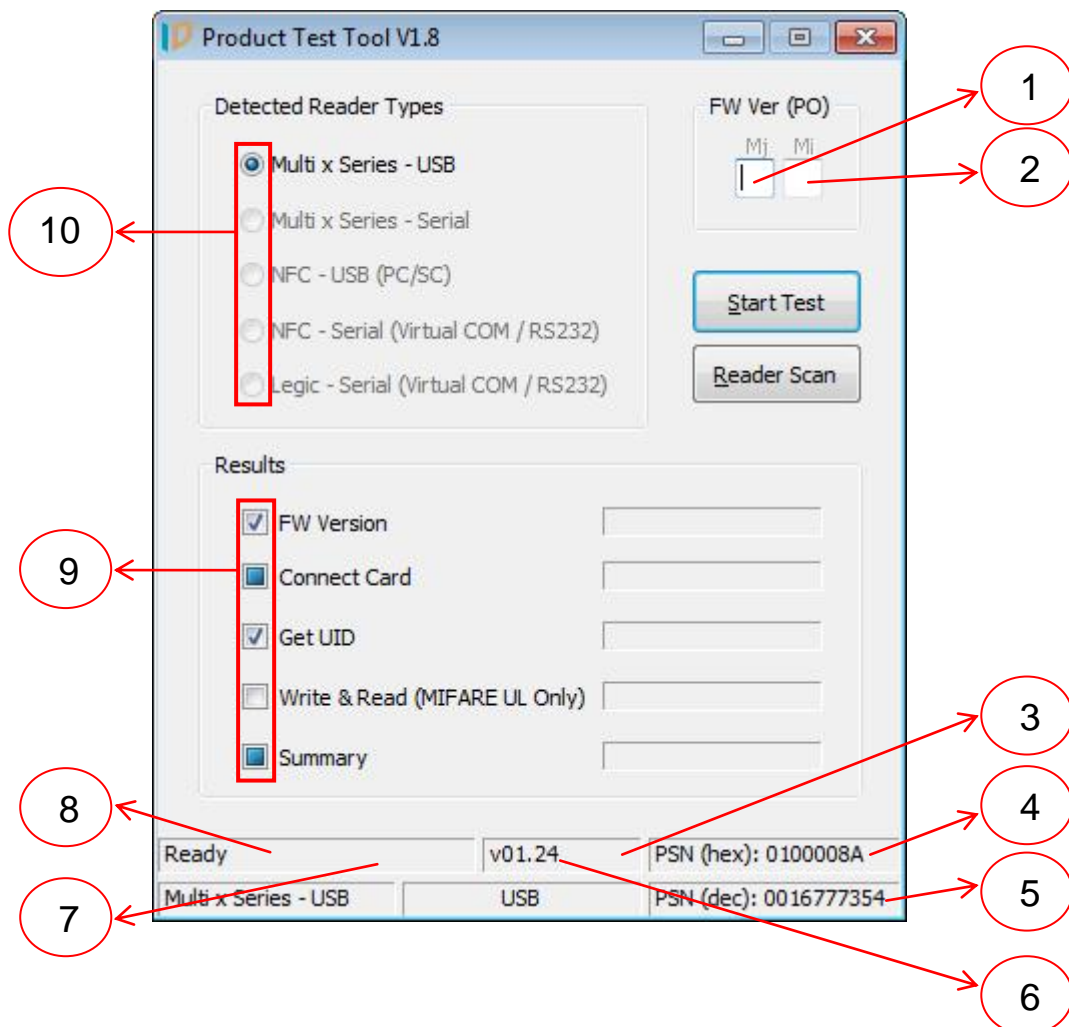
- a) Retrieve the firmware version & serial number of the connected reader
- b) Compare the firmware version of the connected reader with the expected firmware version
- c) Retrieve the UID of the card
- d) Write/Read at/from memory block 09 of a MIFARE® UL test card
- e) Show summary of all tests

## 4 Product Test Tool

### 4.1 Starting the tool

Double clicking the **Product Test Tool.exe** will launch the application. On startup, it will look for the available readers that are connected to the host and enables all the available reader types. This may take several seconds depending on available COM ports. It automatically selects the first detected reader type, displays the reader information in the status bar and would be ready to start the testing process.

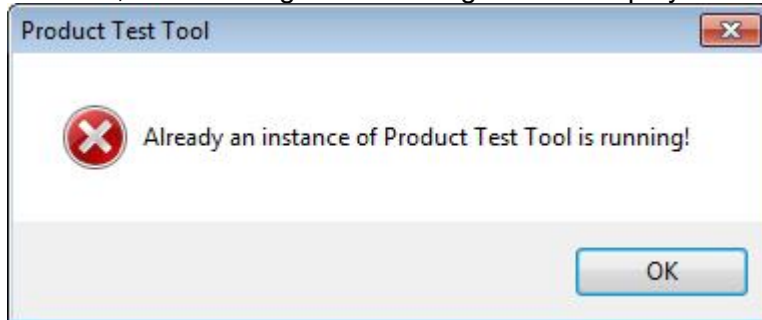
### 4.2 About the dialogue fields



1. Mj – Major firmware version
2. Mi – Minor firmware version
3. Firmware version of the selected reader
4. PSN of the selected reader in hexadecimal (hex) format
5. PSN of the selected reader in decimal (dec) format
6. Port Setting Information
7. Reader Type
8. UID of the testing card (Card UID)
9. Test case selection check boxes
10. Reader type radio buttons

### 4.3 Running more than one instance of the tool

Only one instance of the application can be executed. If you try to run more than one instance, the following error message will be displayed:



### 4.4 Closing the tool

The tool can be closed by using the key board or mouse

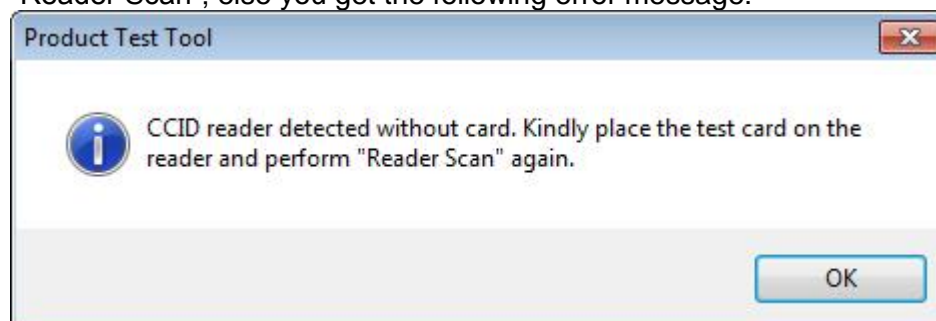
- Mouse: Clicking the close [x] button in the title-bar of the main dialogue
- Keyboard:
  - Pressing the "**Esc**" key
  - Pressing the "**Alt + F4**" combination

## 5 Testing Readers

### 5.1 To test a reader

- To test a reader you have to select a reader type. By default, the very first detected reader will be selected automatically
- Enter the firmware version in the Mj & Mi text-boxes. For more information on this, refer section 5.2
- Place a single contactless test card on top of the reader
- Select test cases of your choice. For more information on this, refer section 5.3
- Click "**Start Test**" button or press "**Alt + S**" or simply press the "**Enter**" Key

**Note:** If you want to test a Multi-x reader with CCID or CCID+HID firmware, then the test card should be placed on the reader before starting the application or while performing a "Reader Scan"; else you get the following error message:



## 5.2 Entering the firmware version in the Mj & Mi edit-boxes

Identive Technologies' readers come with a firmware version in the **Mj.Mi** format. For example, if the version is 1.12, then "1" is considered as the Major version; "12" is considered as the Minor version and "." being the separator between those two fields. The following points convey the information on Mj and Mi edit-boxes.

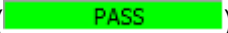

- The values to be fed in the Mj and Mi edit-boxes are considered to be in decimal format.
- The user is allowed to insert only numerical values from 0 to 9 and each text-box is limited to 2 digits only.
- The following table explains the major (Mj) and minor (Mi) version fields that should be entered by the user based on the FW version:

FW Version	Mj	Mi
06.13	"6" or "06"	"13"
06.03	"6" or "06"	"3" or "03"
06.30	"6" or "06"	"30"

- While inserting the Mj and Mi values, the user has the flexibility to write them continuously. i.e., after writing two characters in Mj field, the tool automatically moves the cursor to the Mi field; No need to enter the "." field or place the cursor in the Mi field.
- If the user wants to enter just a single digit in **Mj**, then he has to press a **"Tab"** key or click into **Mi** edit-box to proceed entering the **Mi** value.

## 5.3 Test results

Test result will be "PASS" or "FAIL".

"PASS" is indicated with a green color background (  )  
and "FAIL" is indicated with a red color background (  ).

- **FW Version:** This test compares the FW version of reader with the one entered by the user (refer section 5.2). If the tool is used for installation test, uncheck "FW version" check-box.

**Note:** To retrieve the FW version from the Multi-ISO reader,

- FW v1.16 or higher is needed for Multi-ISO – USB reader
- FW v1.15 or higher is needed for Multi-ISO – Serial reader

- **Connect Card:** User can't skip this test (check-box will be in intermediate state), since this will establish communication with the card. If connect to card fails then it is not possible to get UID or read/write card. So if this fails next two test cases will not be performed by the tool.
- **Get UID:** In this test case, application will get the UID of the card and display it in the UID field in the status-bar of the tool

**Note:** If one tries to get the UID of a MIFARE DESFire tag from an AxxB NFC reader (without a reader power-cycle), the UID will be accessible only on alternate tests. This is a normal behavior.



- **Write & Read (MIFARE UL Only):** By default, this test is in the disabled state. If it is enabled, then the application will,
  - Read data from 9<sup>th</sup> memory block of the card. This is the back-up data and will be used for restoring these bytes after the testing.
  - Write four bytes of data '1234' to 9<sup>th</sup> memory block
  - Read data from the same memory block.
  - Compare the read data with written data ('1234'); if matches result is considered as a PASS case
  - Restore the card with the backed-up data in the same memory block

**Note:** This test is implemented only for "MIFARE® UL" cards

- **Summary:** This summarizes all the results together. If all the above selected test cases are passed, then the summary shows a PASS status; else a FAIL status.

## 6 LED behavior

PTT (from v1.9.4) has incorporated a LED behavior for the AxxB readers and LEGIC readers that have LEDs to reflect the test results.

### 6.1 NFC Desktop Reader ADRB & ADRBv2

**During & after production:** The default LED state of the reader is "always" OFF during reader power-on. But during production, when the reader is tested using PTT tool, the LED state is set as per the following table:

	Green LED	Red LED	Remarks
Reader detected	ON	OFF	The LED state set by PTT is just for showing up the test results and will not be affecting the default power-on state. This means after next power-on, both LED will be OFF again.
Test FAIL	OFF	ON	
Test PASS	ON	ON	

### 6.2 LEGIC Reader AxxL

**During production:** Before production testing, the default LED state of the reader is OFF. During production, the PTT sets & configures the LEDs as per the following table:

	Green LED	Red LED	Remarks
Reader detected	ON	OFF	The LED state set by PTT also affects the default power-on state. This means after next power-on, both LED will be one of these three current test statuses.
Test FAIL	OFF	ON	
Test PASS	ON	ON	

**After production:** PTT detects the current LED status of the device. In which,

- if both LEDs are ON, the device is identified as a successfully produced device and preserves the default LED status for further tests.
- else, PTT identifies the device as "untested" and sets the LED status as per the above table.

## 7 Reader Scan

On clicking the “**Reader Scan**” button or by pressing the “**Alt + R**” key combination, the tool will start scanning the available readers that are connected to the host. Based on the available readers, the radio buttons of the respective reader types are enabled. For continuous testing, one can select a particular reader type, perform tests with the reader, disconnect the reader and connect a new reader of the same kind without redoing the “Reader Scan”.

## 8 LogPTT.txt file

LogPTT.txt is the log file of this application that would be created in the application directory. It holds the result for each test and is stored in following format. PTT creates this file automatically, if not exist already and further test results will be appended to this file. The following is an example of the log data inside the LogPTT.txt file:

```
(This log contains the fields "Date", "Time", "PSN", "FW Version", "Result", "Reader Type")
Jul 17, 2013 11:43:02 0100008A(h) / 0016777354(d) 01.23 PASS Multi x Series - USB (CCID)
Jul 17, 2013 14:37:00 00019845(h) / 0000104517(d) 06.08 FAIL NFC - Serial
Jul 17, 2013 14:45:06 00000019(h) / 0000000025(d) 01.17 PASS Multi x Series - USB
Oct 29, 2013 09:16:57 - NA - / - NA - 02.00 PASS LEGIC - Serial (SM4200,
HW:v01.00, FW:v02.00.02.00)
```

### Note:

- The reader type “Multi x Series – USB (CCID)” refers to the reader models AMLx2US00 (with CCID firmware) & AMLx2US00-KBD (with CCID+HID firmware)
- Logging of “PSN” is not supported with LEGIC reader. Detailed information of the chipset is shown in the “Reader Type” section of the log file entry

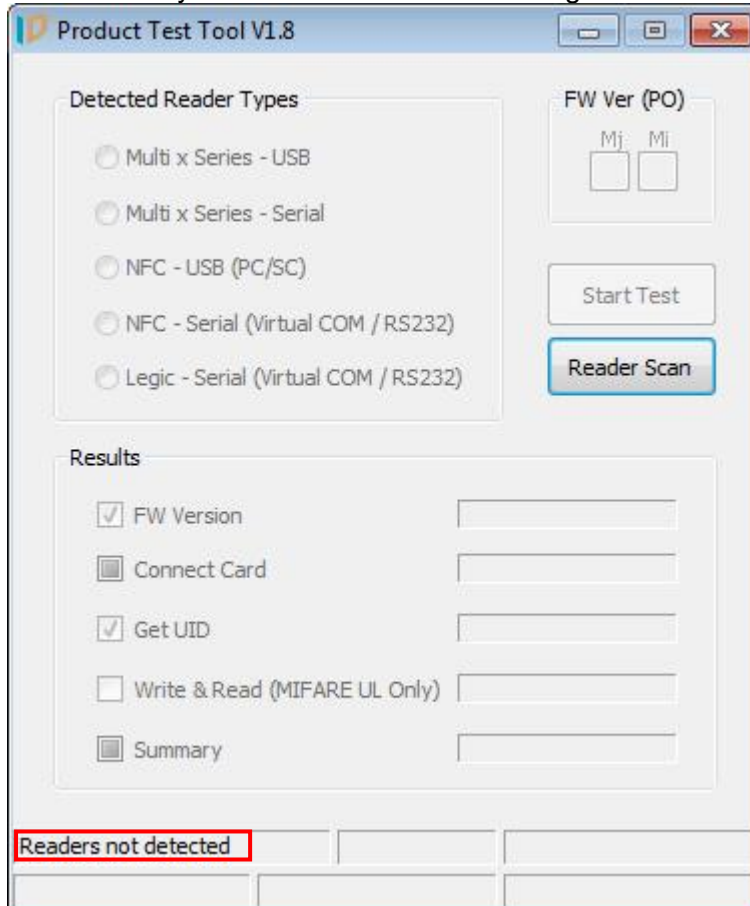
## 9 Limitations

- Read and write to card test is implemented only for “MIFARE® UL” tags
- Reader that was unplugged after finishing the reader scan can't be identified, unless the reader scan has happened again.
- Testing a reader that was unplugged after the reader scan will show a FAIL result; i.e., it will not intimate the unavailability of the already detected reader.
- PTT checks for serial readers that are connected at the following ports & baud rates only:
  - **COM Port No.** : COM1 to COM50
  - **Baud rate** : 9600-8-N-1 and 115200-8-N-1

## 10 Screenshots of various test cases

### 10.1 No readers are connected / detected

In status bar you can see the status message and “Reader Scan” button alone is active.



## 10.2 Testing a reader with default test cases

In this case the expected FW version matches with the reader FW version.

The screenshot shows the 'Product Test Tool V1.8' window. Under 'Detected Reader Types', 'Multi x Series - USB' is selected. The 'FW Ver (PO)' section shows 'Mj: 01' and 'Mi: 24' in a red-bordered box. Below are 'Start Test' and 'Reader Scan' buttons. The 'Results' section shows a list of tests: 'FW Version' (checked, PASS), 'Connect Card' (checked, PASS), 'Get UID' (checked, PASS), 'Write & Read (MIFARE UL Only)' (unchecked, empty), and 'Summary' (checked, PASS). At the bottom, a table displays test data:

UID: 04A99BF9670280	v01.24	PSN (hex): 0100008A
Multi x Series - USB	USB	PSN (dec): 0016777354

### 10.3 When FW versions do not match

The screenshot shows the 'Product Test Tool V1.8' window. In the 'Detected Reader Types' section, 'Multi x Series - USB' is selected. The 'FW Ver (PO)' section shows 'Mi' as '1' and 'Mi' as '17', both highlighted with red boxes. The 'Start Test' button is visible. The 'Results' section shows a list of tests: 'FW Version' (checked, FAIL), 'Connect Card' (checked, PASS), 'Get UID' (checked, PASS), 'Write & Read (MIFARE UL Only)' (unchecked), and 'Summary' (checked, FAIL). At the bottom, the 'UID' is '04A99BF9670280', the 'FW Version' is 'v01.24' (highlighted with a red box), and the 'PSN (hex)' is '0100008A'. The 'Multi x Series - USB' section shows 'USB' and 'PSN (dec): 0016777354'.

Product Test Tool V1.8		
<b>Detected Reader Types</b>		
<input checked="" type="radio"/> Multi x Series - USB		
<input type="radio"/> Multi x Series - Serial		
<input type="radio"/> NFC - USB (PC/SC)		
<input type="radio"/> NFC - Serial (Virtual COM / RS232)		
<input type="radio"/> Legic - Serial (Virtual COM / RS232)		
<b>FW Ver (PO)</b>		
Mi	Mi	
1	17	
<b>Start Test</b>		
<b>Reader Scan</b>		
<b>Results</b>		
<input checked="" type="checkbox"/> FW Version		FAIL
<input checked="" type="checkbox"/> Connect Card		PASS
<input checked="" type="checkbox"/> Get UID		PASS
<input type="checkbox"/> Write & Read (MIFARE UL Only)		
<input checked="" type="checkbox"/> Summary		FAIL
<b>UID: 04A99BF9670280</b>		
<b>v01.24</b>		<b>PSN (hex): 0100008A</b>
<b>Multi x Series - USB</b>	<b>USB</b>	<b>PSN (dec): 0016777354</b>

### 10.4 Test with write and read case enabled

This test is done with a “MIFARE® UL” tag.

The screenshot shows the 'Product Test Tool V1.8' window. It has a title bar with standard Windows window controls. The main area is divided into several sections:

- Detected Reader Types:** A list of radio buttons for selecting a reader type. 'Multi x Series - USB' is selected.
- FW Ver (PO):** Two input fields for Major (Mj) and Minor (Mi) version numbers. Mj is '01' and Mi is '24'.
- Buttons:** 'Start Test' and 'Reader Scan' buttons are located to the right of the reader types.
- Results:** A section with a list of test items, each with a checkbox and a corresponding status bar. All items are checked and show 'PASS' in a green bar.
  - ☒ FW Version
  - ☒ Connect Card
  - ☒ Get UID
  - ☒ Write & Read (MIFARE UL Only)
  - ☒ Summary
- Footer:** A table-like structure at the bottom displaying test results.

UID: 04A99BF9670280	v01.24	PSN (hex): 0100008A
Multi x Series - USB	USB	PSN (dec): 0016777354

This test is done with an “ISO 15693” tag.

(Write and read functionality works only with a “MIFARE® UL” tag)

The screenshot shows the 'Product Test Tool V1.8' window. It has a title bar with standard Windows controls. The main area is divided into several sections:

- Detected Reader Types:** A list of radio buttons for selecting a reader type. 'Multi x Series - USB' is selected.
- FW Ver (PO):** Two input fields for Major (Mj) and Minor (Mi) version numbers. Mj is '1' and Mi is '24'.
- Buttons:** 'Start Test' (blue) and 'Reader Scan' (grey).
- Results:** A list of test items with checkboxes and status bars.

Test Item	Status
<input checked="" type="checkbox"/> FW Version	PASS
<input checked="" type="checkbox"/> Connect Card	PASS
<input checked="" type="checkbox"/> Get UID	PASS
<input checked="" type="checkbox"/> Write & Read (MIFARE UL Only)	FAIL
<input checked="" type="checkbox"/> Summary	FAIL
- Footer:** A table displaying test results.

UID: E00401501E2B879E	v01.24	PSN (hex): 0100008A
Multi x Series - USB	USB	PSN (dec): 0016777354

**10.5 When card is not placed/detected, card not supported by the reader or the reader was unplugged from host after reader scan**

Product Test Tool V1.8

Detected Reader Types

- ☒ Multi x Series - USB
- ☐ Multi x Series - Serial
- ☐ NFC - USB (PC/SC)
- ☐ NFC - Serial (Virtual COM / RS232)
- ☐ Legic - Serial (Virtual COM / RS232)

FW Ver (PO)

Mj: Ml

01 24

Start Test

Reader Scan

Results

- ☒ FW Version **PASS**
- ☒ Connect Card **FAIL**
- ☒ Get UID
- ☐ Write & Read (MIFARE UL Only)
- ☒ Summary **FAIL**

UID: ERROR v01.24 PSN (hex): 0100008A

Multi x Series - USB USB PSN (dec): 0016777354