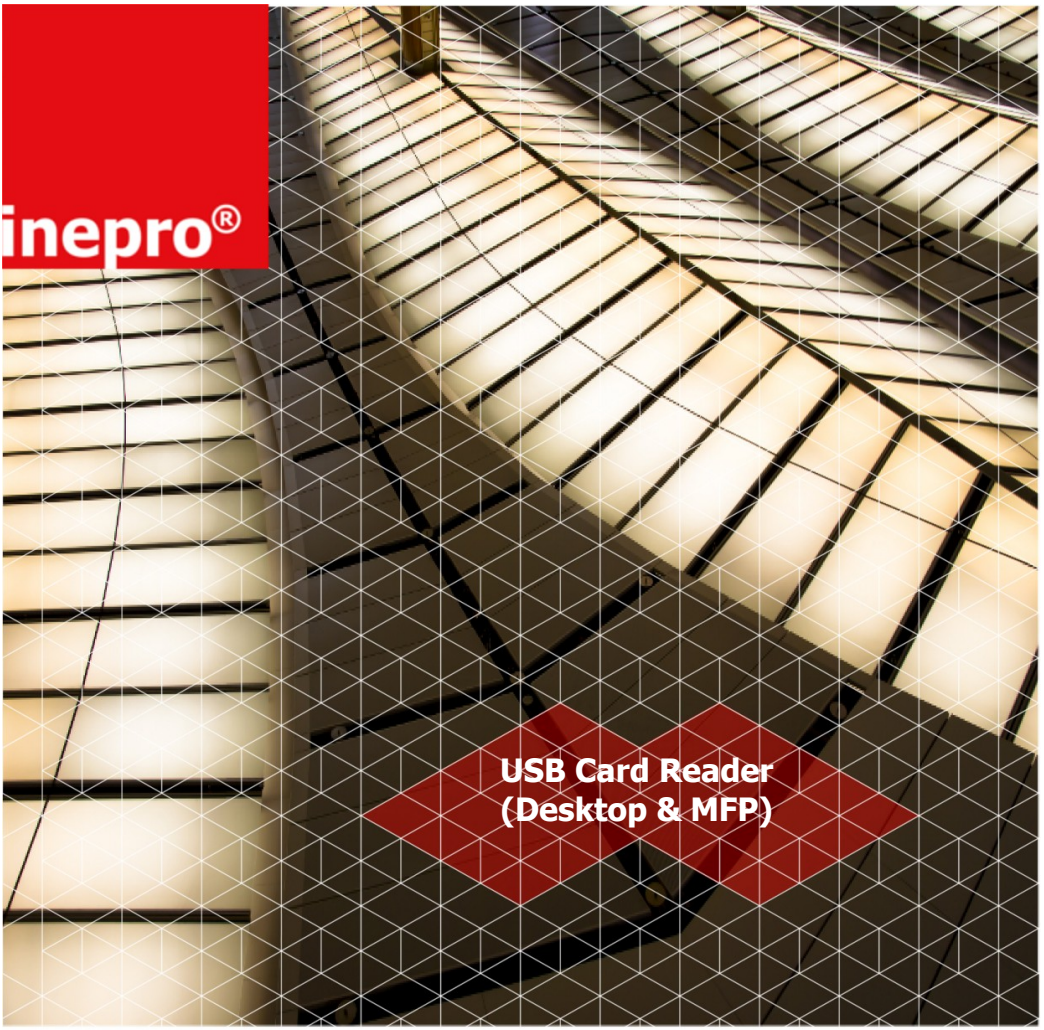


Technical Manual | USB Card Reader (Desktop & MFP)

Product Version: Mk. II

Version of this manual: 3.0.4

USB Card Reader (Desktop & MFP)

The most versatile card reader solution

Congratulations on your selection of Inepro card readers. We are certain you will be pleased with your purchase of one of the flexibele solutions of the market.

We want to help you get the best result from your Inepro Back Office Suite. This manual contains information on how to do that; please read it carefully. Due to continuous product improvements this manual is subject to changes without notice.

We strongly recommend you read the license agreement to fully understand its coverage and your responsibilities of ownership.

Your Inepro dealer is dedicated to your satisfaction and will be pleased to answer your questions and your concerns.

Best wishes,
Inepro BV.

USB Card Reader (Desktop & MFP)

Version 3.0.4 created: July 2015 in Nieuw-Vennep.

Publisher
Inepro B.V.

Managing Editor
K. de Graaf

Technical Editors
P. Blom
P. Grimmerink

Cover Design
H. Wagenaar
K. de Graaf

Team Coordinator
R. Groen

Production
Inepro B.V.

Table of Contents

Directives

ATTENTION!!

Read this manual carefully before installing the Card Reader!

Mains connection

Before connecting the appliance to the mains, check that the mains supply voltage corresponds to the voltage printed on the type plate of the adapter. If the mains voltage is different, consult your supplier.

Guarentee

No guarantee can be given if safety regulations are not followed.

Changes and/or mdodifications

Changes and/or modfications whch have not been approved by the responsible party can void the user's authorty to operate the equitement.

Security

Always disconnect the power supply before handling anything inside the device.

Indoor User Only

This device may only be used indoors.

FCC Federal Communications Commission - US

This device is complies with part 15 of the FCC rules, operation is subject to two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received, includng interference that may cause undesired operation.

CE Conformité Europeène (Conform European Norm)

This device is in conformity with the EMC directive and low-voltage directive.

End of life directives

Inepro is paying a lot of attention to environmentally-friendly production. Your new device contain materials which can be recycled and reused. At the end of its life specialised companies can dismantle the discarded device to recycle the reusable materials and to minimise the amount of materials to be disposed of. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Introduction

Part I

Introduction

Introduction

The Inepro USB (Universal Serial Bus) card reader consists of a USB interface controller board with a proximity card reader. The controller board is programmed with software to read out the UID (Unique ID) of the proximity card. By default the card reader reads out the CSN (Card Serial Number) of the proximity card.
Please note that the firmware version programmed in the controller board is depending on the proximity card technology and, if needed, customized read out of the UID of the user card.

When a user card is presented to the reader the host device receives the data as a keyboard input in hex format.

The Inepro USB Card Reader has an unique vendor and a application ID. The vendor ID of Inepro = 0x1DA6, the application or product ID = 0x0110. For each Inepro USB Card Reader the same vendor/application ID is used (regardless of the used Inepro USB card reader). At the connection procedure the software version of the Inepro USB Card Reader is send to the host device.

Supported Proximity Card Technologies

USB Communication

The Inepro USB card readers supports the USB 2.0 protocol as a Human Interface Device (HID)

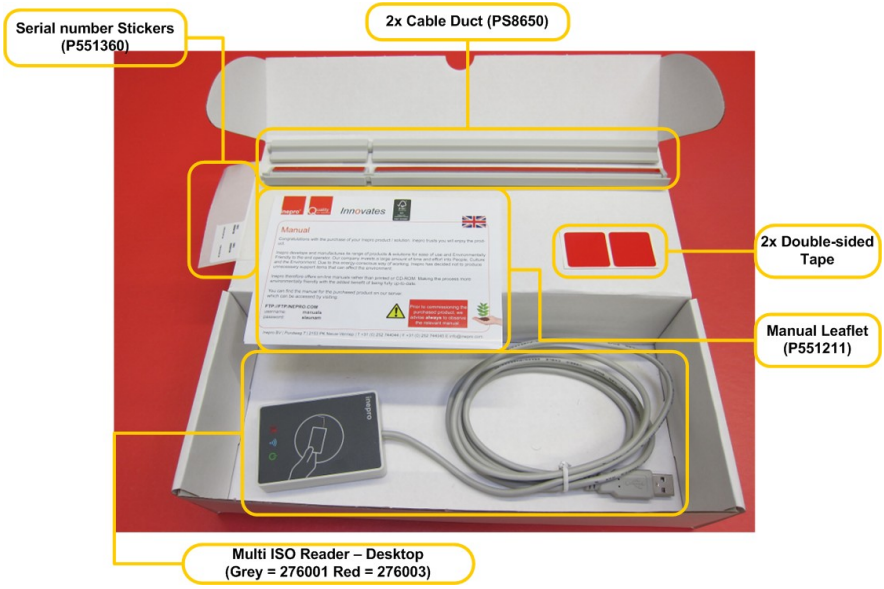
Inepro USB Reader Component List

Part II

Inepro USB Reader Component List

Inepro USB Card Reader Component List

The Inepro USB card reader comes in four version, the desktop and the MFP version in the colours grey and red. The MFP version is meant to be mounted on the side of an MFP machine, the desktop version for use on a flat service or installment inside the MFP.

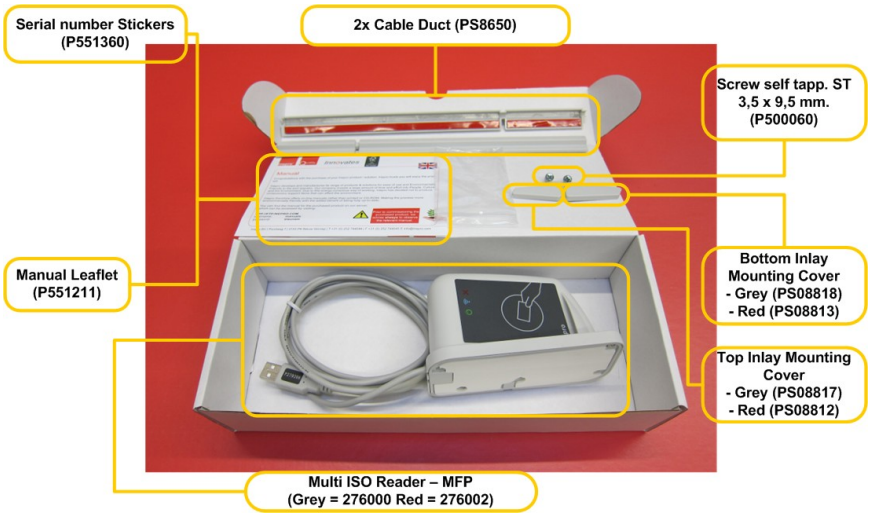


Inepro Desktop USB Card Reader (Grey) Kit Content 276001
(or Red 276003)

The Inepro Desktop USB Card Reader Kit consist of the following items:

1. Desktop USB Card Reader Kit

- 1x Multi ISO Reader Desktop (Grey 276001, Red 276003)
- 2x Double-sided adhesive tape (for attachment of the USB controller to the MFD (Multi Functional Device))
- 1x Manual Leaflet (P551211)
- 1x Serial Stickers (P551360)
- 2x Cable Duct (PS8650)



Inepro MFP USB Card Reader (Grey) Kit Content 276000 (or Red 276002)

The Inepro MFP USB Card Reader Kit consist of the following items:

Inepro USB Reader Component List

2. MFP USB Card Reader Kit

- 1x Multi ISO Reader MFP (Grey 276000, Red 276002)
- 2x Cable Duct (PS8650)
- 1x Manual Leaflet (P551211)
- 1x Serial Stickers (P551360)
- 1x Bottom Inlay Mounting Cover (Grey PS08818, Red PS08813)
- 1x Top Inlay Mounting Cover (Grey PS08817, Red PS08812)

Operation

Part III

Operation

Operation

Connect the reader

Connect the reader to a free USB port.

Inner operation of the Inepro USB reader

The card number that is read by the Inepro USB Card Reader is a hex decimal format. This hex decimal number is divided into two and after that the keyboard representation code of the number shall be send by the USB interface controller. After the last character an <enter> keystroke code is send.

The software driver that runs in the host will convert the code to the ASCII character of the keystroke code.
When the card is removed, only a single <enter> keystroke code is send.

For example:

- Read value: 0x12345678 (hex decimal number)
- Send keystroke data: <0x1E><0x1F><0x20><0x21><0x22><0x23><0x24><0x25><0x58>
- Conversion to ASCII characters by the HID host driver: <1><2><3><4><5><6><7><8><enter>

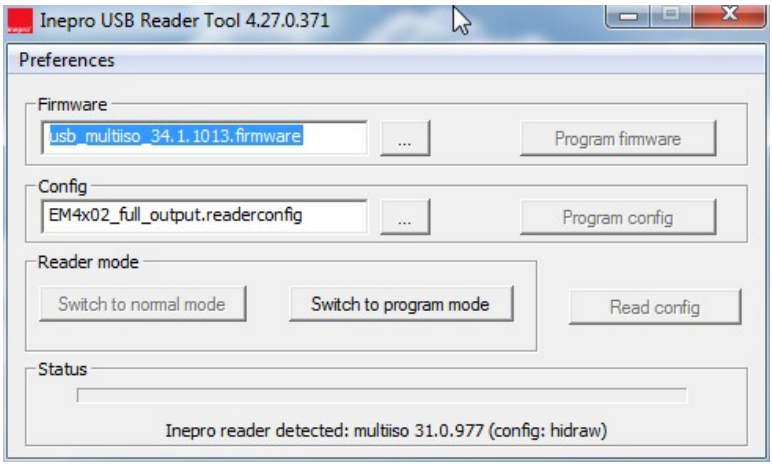
Inepro Card Reader Tools

Part IV

Inepro Card Reader Tools

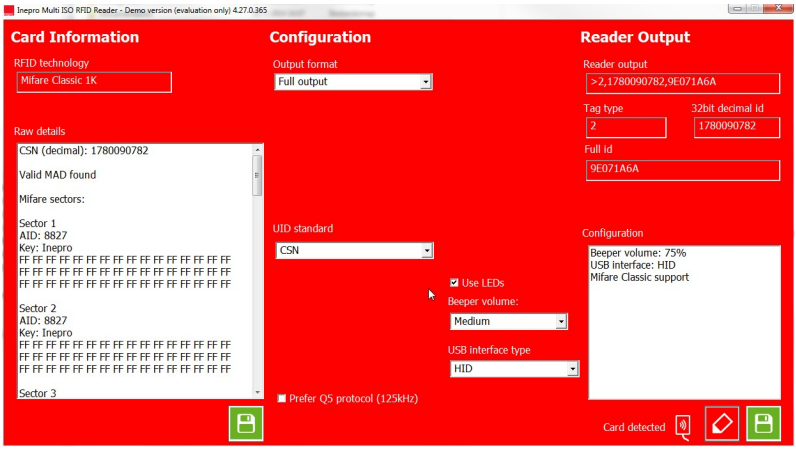
Inepro Card Reader Tools

There are two Inepro Card Reader Tools; the Inepro Reader Software and Inepro Reader Update. The Inepro Reader Software is used to read out a card and view the card details like the card ID and sector information. It can also be used to see if other output formats will return the desired card ID and to create and store custom configuration files. The Inepro Reader Update Tool is used to update to Inepro reader with new firmware or another or new configuration file.



Inepro Reader Update Tool

With this tool it is possible to upgrade the reader firmware and to program a custom created config file. For more information regarding this Reader Program Tool please consult the user manual.



Inepro Reader Software Tool

With this software card information can be read out, and custom configuration files can be stored.

HID or HID?

When working with card reader the term 'HID' will emerge, so what does it mean?
Well, the complex issue with this question is, that there are two concepts that both are called 'HID' and both are related to the card reader. Therefore both will be explained:

HID

Hughes Identification Devices, or HID is often a reference to one or more card technologies developed by the Hughes Identification Devices company, like HID Prox or iClass SE.

HID

A Human Interface Device, or HID is a type of computer device that interacts directly with humans. In this manual the card reader is such a HID ■

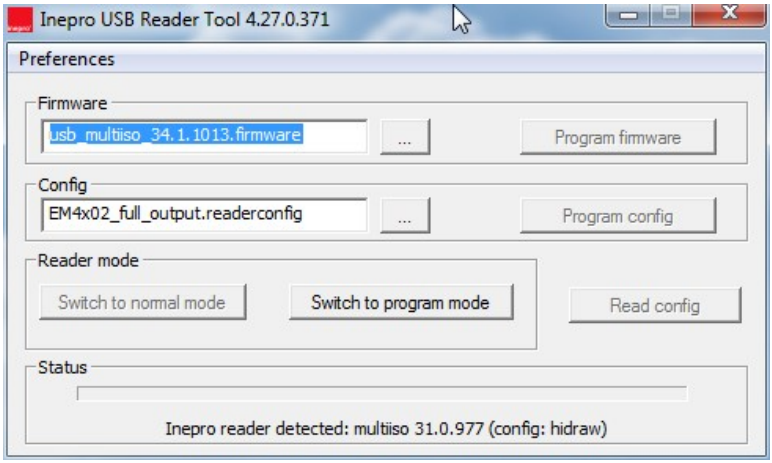
Change the Configuration of the reader

By default the card reader is programmed as full output and will recognize all available card types. This can be changed by changing the configuration of the reader, for example by changing to Classic output. A default classic output configuration file can be found in the config files folder. To change the configuration follow the following instructions:

Change the Configuration of the reader

Prequisites:

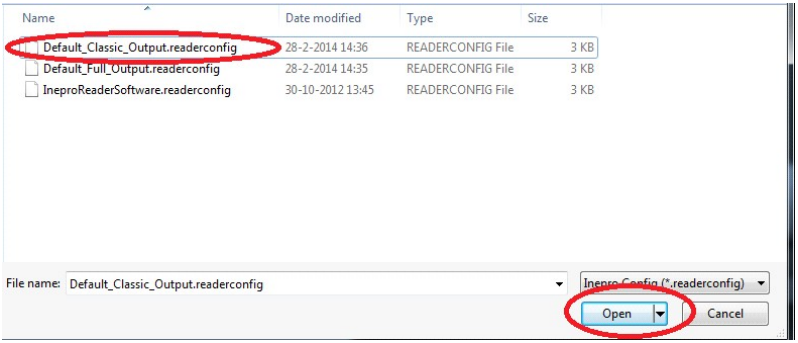
- No prequisites required



1. Open the shortcut to the Inepro Reader Update tool.
   On the bottom of the tool the status of the reader is shown (in this image: 'Inepro reader detected: multiiso 31.0.977 (config hidraw)'). Normally when no reader is connected this will be: 'Inepro Reader Removed'.
   'Inepro reader detected: multiiso 31.0.977 (config hidraw)' means that an Inepro reader has been detected by the software and that that reader is a Multi ISO reader that has the 'HID raw' config file loaded.

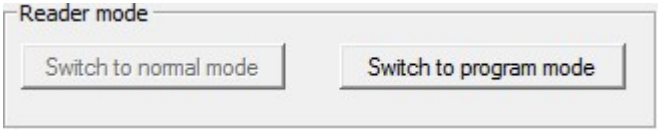
2. Connect the USB connector to a free USB port on your PC
   Shortly after that, the status 'Inepro reader removed', should change to 'Inepro reader detected' and will show the type of the reader and which firmware and config file is loaded on the reader.

3. Select the required config file by clicking the search button in the config block:



4. A browse window is now opened, select the classic output configuration in the config files folder:
   After selecting the correct file, the file name is now shown in the config block, but the button to program the config is still greyed out and cannot be selected.

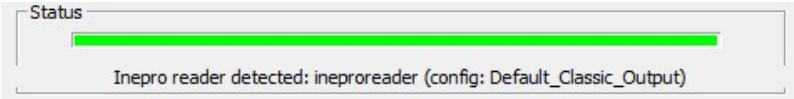
   This is because the reader is in 'normal mode' and not in 'program mode'.



5. To set the reader in program mode click on “Switch to program mode” in the Reader mode block.
6. To verify that the reader is in program mode the 3 led’s on front of the reader will blink continuously.

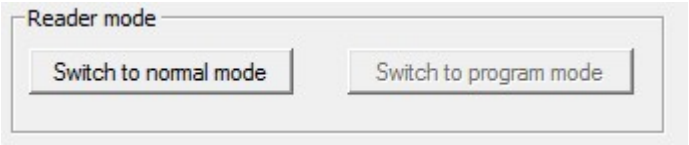
Change the Configuration of the reader

7. Now click “Program Config” to actually upload the selected config to the reader.



Shortly the Status will show; “Programming” but it will only take a few seconds, once finished the Status bar is completely green.

8. Now switch back the reader to normal mode by pressing the button “Switch to normal mode” in the reader mode Block.



The reader will beep twice and after a few seconds only the right LED will light up.

9. Close the Inepro USB reader tool and remove the USB connector from your PC.

10. To see now what has been changed, please follow the steps of the chapter: “Default Card read out”.
    As you will see the output is now changed.
    It now only shows the Hexadecimal card ID and will only return <Enter> when removing the Card ■

Inepro Reader Software

With the Inepro Reader software it is possible to read out the RFID technology of the card as well as all the RAW details. These details can be stored, typically to export to third party software/databases. The Inepro Reader software is using 'HID Raw' as communication with the reader. The type of communication is set in the configuration, the default configuration uses HID. So to let the card reader communicate with the Inepro Reader software the reader must be programmed with a configuration containing 'HID Raw' communication.

To change the configuration please see the chapter: “Change the configuration of the reader”. Change the configuration using the Following config file: “IneproReaderSoftware.readerconfig”.

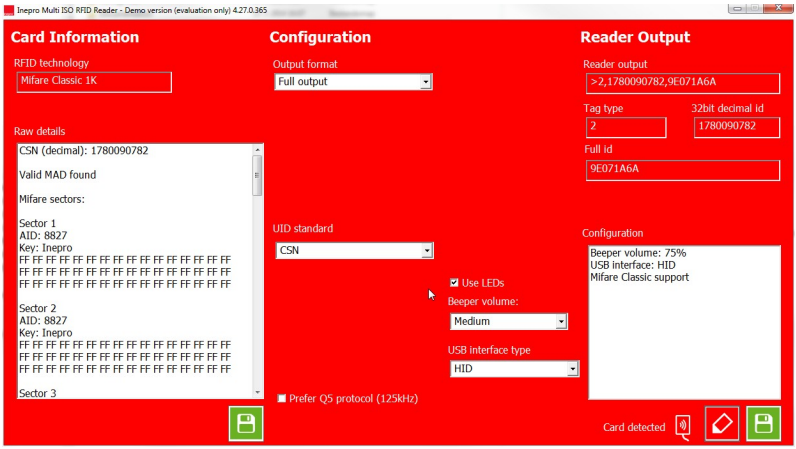
The following settings can be adjusted and afterwards stored in a configuration file which can be programmed in to the reader:

Field	Value	Description	Default
Output format	▪ Classic Output ▪ Full Output	▪ Only ID of the card ▪ Type ID, decimal and hexadecimal ID	Full Output
Byte order	▪ Default ▪ Reversed	▪ Standard conversion from Decimal to Hexadecimal ▪ Paired reversed conversion from Decimal to Hexadecimal ('ABCDEF' -> 'EFCDAB')	Default
Output Length	▪ Automatic ▪ 4 char. ▪ 5 char. ▪ 6 char. ▪ 7 char. ▪ 8 char. ▪ 9 char. ▪ 10 char. ▪ 11 char. ▪ 12 char. ▪ 13 char. ▪ 14 char. ▪ 15 char. ▪ 16 char. ▪ Remove leading zero’s	▪ The actual length of the ID ▪ Up to 4 characters with leading zero's ▪ Up to 5 characters with leading zero's ▪ Up to 6 characters with leading zero's ▪ Up to 7 characters with leading zero's ▪ Up to 8 characters with leading zero's ▪ Up to 9 characters with leading zero's ▪ Up to 10 characters with leading zero's ▪ Up to 11 characters with leading zero's ▪ Up to 12 characters with leading zero's ▪ Up to 13 characters with leading zero's ▪ Up to 14 characters with leading zero's ▪ Up to 15 characters with leading zero's ▪ Up to 16 characters with leading zero's ▪ Remove leading zero’s	Automatic

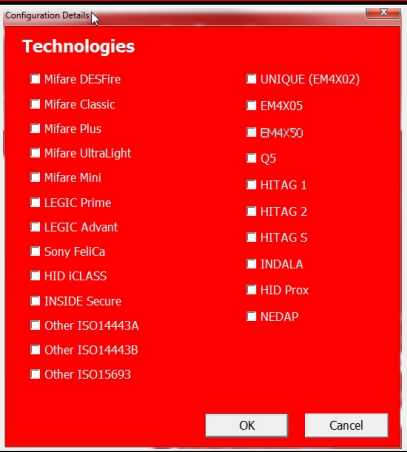
Inepro Reader Software

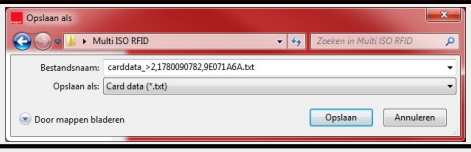
Field	Value	Description	Default
UID standard	▪ CSN	▪ Also known as Card Serial Number	CSN
Prefer Q5 protocol	▪ Ticked ▪ Not Ticked	▪ The 125 kHz cards will be preferred to the 13,65 MHz cards ▪ The 13,65 MHz card will be detected earlier then the 125kHz card (because of the longer wavelength)	Not ticked
Decimal output	▪ Ticked ▪ Not Ticked	▪ The output will be decimal ▪ The output will be hexadecimal	Not ticked
Ignore card removed	▪ Ticked ▪ Not Ticked	▪ When the card is removed, the <enter> character will be send ▪ When the card is removed, the Card ID will be send	Not ticked
Use LEDs	▪ Ticked ▪ Not Ticked	▪ LED's will not be active ▪ LED's are active	Ticked
Beeper volume	▪ Off ▪ Low ▪ Medium ▪ High	▪ The beeper is switched off ▪ Low volume level ▪ Medium volume level ▪ High volume level	Medium
USB interface type	▪ HID ▪ HID Raw (without driver) ▪ CDC ACM (Virtual COM port) ▪ USB Ethernet	▪ HID (keyboard communication) this communication will need no drivers installed on the host. ▪ HID Raw is communication without a driver, so the software which is used will need an internal driver. The Inepro Reader tool uses this type of communication. ▪ ODC ACM (virtual comport) this communication protocol will act as a serial comport. ▪ USB Ethernet	HID

Inepro Card Reader Tools



Card technologies

Icon	Description
	
	By the reader accepted card technologies can be switched on or off. When a card is presented to the reader this card type is automatically switched on. This configuration can be found under the edit button: After changing 1 or more settings a complete configuration list is shown in the configuration box.

Icon	Description
	 To store the raw card detail information press the Save button on the left: Type in a correct configuration name so that it is clear which settings it contains or for which project the configuration will be needed and press OK.
	 To Save the configuration click the 'Save' button on the right fill in a recognisable name and click 'OK'. The configuration is now stored and can be selected when programming a configuration file in to the reader, as described in the chapter: “Change the configuration of the reader” ■

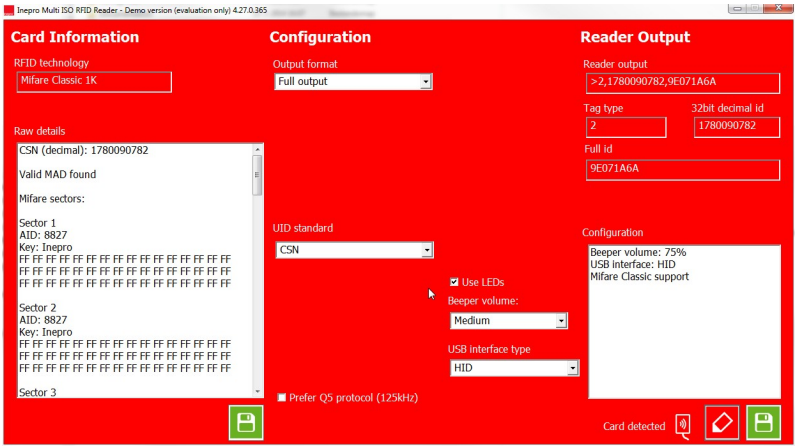
Inepro Card Reader Tools

Default card Read out

By default the card reader is programmed to show a full output of a card via the HID protocol. All available card types will be recognized by the reader. With this configuration the card type ID can be determined and the card ID will be shown.

Prerequisites:

- Card Reader has a valid firmware version
- Card Reader has the 'HID Raw' configuration
- Card Reader mode is set to 'Normal Mode'

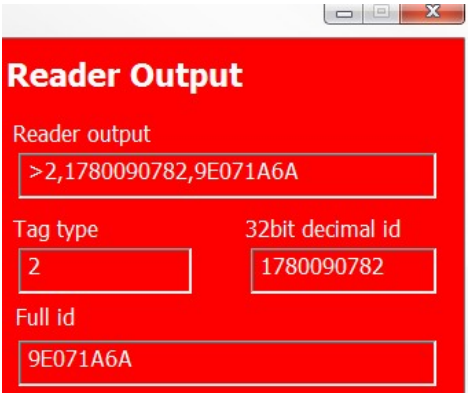


Default card Read out

To read out this complete output perform the following steps:

1. Make sure the USB connector attached to the card reader is connected to a free USB port on the PC
2. Open a blank Word document, notepad or the Inepro reader
3. Present a card (13,65MHz or 125 kHz can be used) to the reader

   When using notepad or Word there will be a number, this is the card ID. In the Inepro Reader much more information can be extracted. The rest of this section will treat the process when the Inepro Reader is used:



In the reader output field the complete output is shown:
>2,1780090782,9E071A6A

4. Remove the card.

Once the card is removed, the software should display the following:
<2,1780090782,9E071A6A

Reader output broken down:

Value	Description	Notes
>	Card is placed	
2	Card type	Mifare (Please find a list with al card type ID's in the documentation folder)
1780090782	Decimal Card ID	Normally in byte reversed order (that is the hex value is divided up in pairs of two and those pairs are set back to front). So, 'ABCDEF' becomes 'EFCDAB' and is then converted to decimals.
9E071A6A	Hexadecimal Card ID	
<	Card removed	

Concept Summery

Concept	Description
InneproReaderSoftware.readerconfig	To communicate with the Inepro Reader Software via the 'HID Raw' communication protocol
Classic output	The output of the reader will only show the hexadecimal card ID
Full output	The output of the reader will show the cardtype ID, decimal card ID and the hexadecimal Card ID

Software Test

Part V

Software Test

Software Test

For the Omni RFID USB reader there are 2 tools available each with its specific features. Connect the Omni RFID USB Reader to a computer or laptop and present a card to the reader. Please note that the reader needs to have the HID RAW Configuration. (See Omni RFID Program tool manual for more details).

Omni RFID Reader Configuration Tool

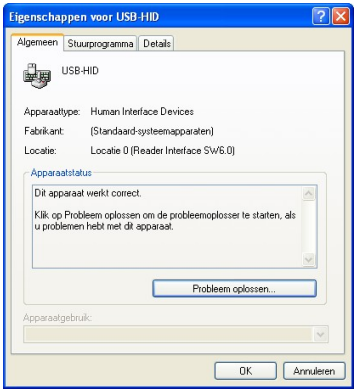
This tool is ideal for card investigation of customer cards
With this tool it is possible to change the behaviour of the card reader, for example it is possible to change the read out of the RFID card but also the LEDs can be switched off or the volume of the beeper can be changed. Once finished it is possible to store the created settings in a special config file which can be programmed via the Inepro Omni ISO Reader Program tool. For more information regarding this Reader and Configuration tool please consult the user manual.

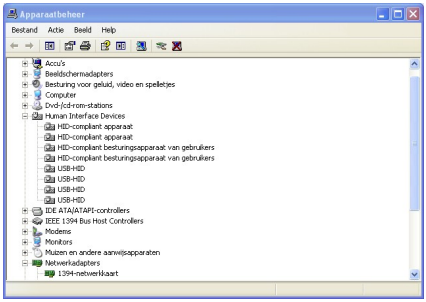
With this tool it is possible to change the behaviour of the card reader, for example it is possible to change the read out of the RFID card but also the LEDs can be switched off or the volume of the beeper can be changed. Once finished it is possible to store the created settings in a special config file which can be programmed via the Inepro Omni ISO Reader Program tool. For more information regarding this Reader and Configuration tool please consult the user manual.

See chapter: Inepro Reader Tools

Test with Windows Device Management:

1. On a PC or laptop without Inepro Test Tool you can also check the version that is in the Inepro USB Card Reader.
2. Connect the Inepro USB Card Reader to the PC or laptop.
3. Go to “Configuration screen -> System -> Device Management -> Human Interface Devices”. One of the available HID-USB devices is the IP Card Reader set.
4. On the main page there is a field “location” and here you will find the software version of the Inepro USB Card Reader .





Software Test

Quick-Test with the Windows Calculator:

1. Connect to Inepro USB Card Reader to the USB PC or laptop.
2. Start the Calculator application on Windows, set de calculator under 'View' in on 'Scientific'.
3. Set the number system to hex decimal ('Hex').
4. Present a card to the Inepro USB card reader.
5. Set the number system to decimal ('Dec') to read out the decimal value of this number. This is the card number ■

Hardware Test

Part VI

Hardware Test

Physical test Inepro USB card reader

1. Remove the top cover of the USB controller
2. Connect the Inepro USB Card Reader to the USB port of a computer.
3. Check the indicator LED's to see if the board is operating as it should.

LED's

On the USB interface board are a number of LED's. Each of the LED's has a label, explaining their use. See the table below

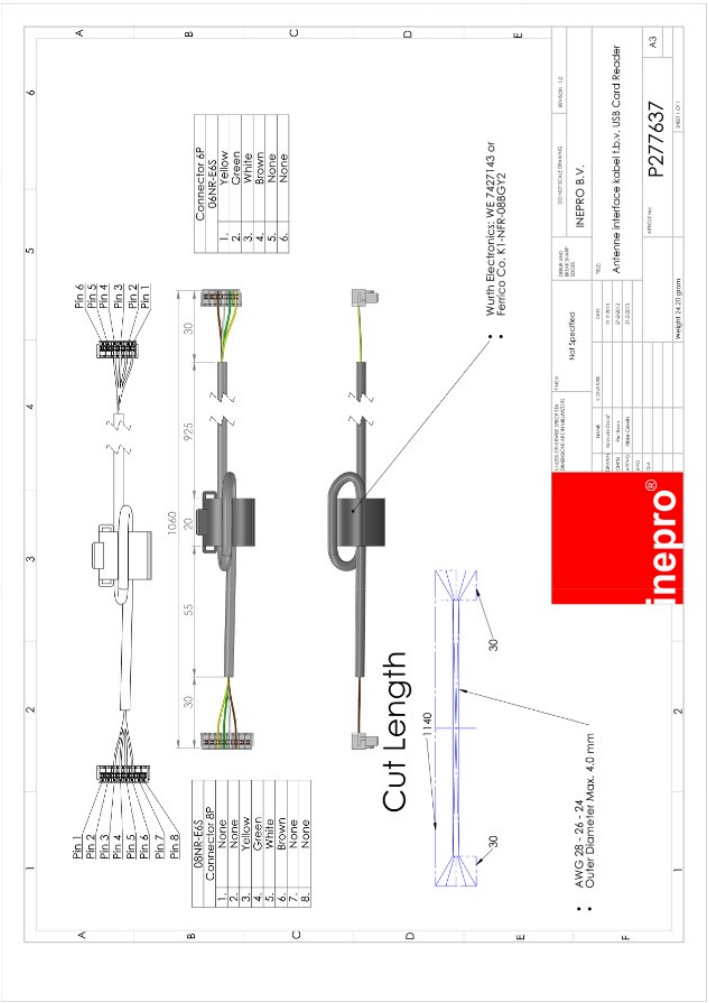
Image	Label	Function	Standby / OK	Busy	Not OK
	<undefined>	<undefined>	<undefined>	<undefined>	<undefined>
	Connection	Connection / transmission	Burns continuously	Burns continuously	Off
	On / Off	On / Power	Burns continuously	Flashes	Off

Appendix I

Part VII

Appendix I

Appendix I: Antenne Interface Cable for Card Reader



Notes

Part VIII

Notes

Notes

This area is meant for the reader's notes:

Notes