CROSSMATCH® TECHNOLOGIES

D SCAN® AUTHENTICATOR

User Manual

Cross Match® Technologies, Inc.

D SCAN® AUTHENTICATOR

Document Authentication Reader

User Manual

Version 1.0 (February 2014)

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Introduction

Appropriate Operation

The D SCAN® AUTHENTICATOR captures color images and reads full pages to capture and transmit personal and document data. The device can capture an entire data page from any ID document in different types of light. The device can read the RFID data contactless found on the RFID tag.

It is intended for the use in an IT-devices environment and the operation and installation must be in connection with suitable computer equipment. When operating, the electrical installation and cabling must comply with the IEC 60950-1 Standard.

Who should read this book

You should read this book if you are a user who operates the D SCAN Authenticator document authentication reader device.

How this book is arranged

- **Chapter 1 "Introduction"** covers standards for the manual and describes the safety instructions. The chapter also contains a glossary of terms.
- **Chapter 2 "Installation"** describes the D SCAN Authenticator and how to install the document authentication reader.
- **Chapter 3 "How to use the D SCAN Authenticator"** describes how to use the indicators on the device to capture the best quality images.
- **Chapter 4 "Maintenance"** explains how to maintain the D SCAN Authenticator.
- **Chapter 5 "Problems and Corrections"** describes the problems, causes, and corrections.
- **Chapter 6 "Customer Care and Contact Information"** explains how to get the technical support that is available from Cross Match Technologies.
- **Chapter 7 "Product Warranty"** contains the full text of the product warranty from Cross Match Technologies.

Standards

The following standards are used in this book:

- **Bold UPPER/lower case** and *tilted* text identify important information.
- Special information can appear as a Note, Caution, Warning, or Danger.

Note A Note contains additional information. To ignore a note can cause a delay, but not mechanical damage or personal injury.

Caution A Caution contains a method to prevent data loss or damage to equipment. To ignore the caution can cause damage or data loss.

Warning A Warning describes an action that can cause injury or loss of life. Mechanical damage can occur.

DANGER A Warning describes an action or condition that causes injury or loss of life. Mechanical damage can occur.

FCC statement

FCC ID: WO8RJ1479

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

The power source for the Authenticator must provide an output voltage of 12 V DC. The electric current range of the power supply unit must be max. 1.7 A. Use only power supply units that comply with the class B limits of 47 CFR 15, Subpart B.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Information to the user

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada

IC: 7944A-RJ1479

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.”

The power source for the D SCAN Authenticator must provide an output voltage of 12 V DC. The electric current range of the power supply unit must be max. 1.7 A. Use only power supply units that comply with the class B limits of ICES-003.

Statement of Compliance

Cross Match Technologies GmbH, hereby, declares that this device is in compliance with the essential requirements and other relevant provisions of Directives 89/336/EEC and 2006/95/EC.

Declaration of Conformities may be directly obtained from Cross Match Technologies GmbH.

Recycling information

Cross Match Technologies recommends that customers dispose of their used computer hardware, monitors, printers and other peripherals in an environmentally sound manner. Potential methods include reuse of parts or whole products and recycling products, components and/or materials.

WEEE Directive

The following is the test of the Waste Electrical and Electronic Equipment (WEEE) Directive.

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be desposited at an appropriate facility to enable recovery and recycling.

Safety when operating

This product has been designed, manufactured and tested according to international safety standards. The following general safety precautions must be observed during all phases of operation to ensure safe operation of the D SCAN Authenticator. Cross Match Technologies GmbH assumes no liability for the customer's failure to comply with these requirements.

- When operating, the electrical installation and cabling must comply with the current IEC 60950-1 standard.
- The power supply must be provided by an certified power supply unit with an output voltage of 12 V DC. The maximum electric current range of the power supply unit is 1.7 A.

Caution Use only the power supply unit delivered with the Authenticator.

- To connect the document reader to a computer, use a shielded USB data cable as supplied with the reader.
- The device must be operated only in a dry room. Exclude any condensation.
- The environmental temperature range is 41 °F to 113 °F (+5 °C to +45 °C).

Caution Do not open the device. Repairs are only allowed by Cross Match Technologies. Changes or modifications not expressly approved by Cross Match Technologies could void the user's authority to operate the equipment.

- Whenever it is likely that the electrical protection has been compromised, the device and system must be made unplugged and secured against unauthorized use.
- Do not apply mechanical stress to the document contact area. Do not throw heavy objects onto it. The platen is made of glass and might be destroyed if not handled properly. A broken platen might have sharp edges, which could cause injuries.
- Do not scratch the document contact area. The platen is vulnerable to sharp metallic instruments (knives, scissors), extremely hard objects (diamonds) and also dust. Scratches may reduce the image quality and thereby lead to scanning results below the required quality specification.
- Always keep the document contact area clean. Use the recommended glass cleaner and lint-free tissue for cleaning. Do not use oily or abrasive cleaners since they might affect the platen surface quality.
- Do not pour liquids (water etc.) onto the D SCAN Authenticator. The device is protected against cleaning with a damp cloth or tissue, however, it is not waterproof.

Warning Do not look directly into the lights of the document contact area. Maintain a required minimum distance of not less than 0.3 meters.

Glossary

This section contains some terms that are used in this manual.

Table 1.1 Glossary of terms

Term	Definition
Barcode	A means of storing data as a pattern of lines or dots.
DIN	Deutsches Institut für Normung e.V. und deutsche Industrie-Norm (German Institute for Standardization and Industrial Standard Specification). Contains the fundamental standards for many products of the industry.
DSE	D SCAN Essentials. Base level software for the D SCAN Authenticator, which runs on the external computer and support: • USB driver • Low level access to available illuminations, camera, and RFID reader (APDU) via SDK • Human interface control
DSX	D SCAN Extensions. Optional middleware software which supports: • High level document access (optical and RFID) including workflow support, cryptographic protocols, and OCR • Optional SDKs for both software levels • Optional document definitions for customer specific documents • Optional development support • Supports future upgrade of firmware and software
ERZ	Effective Reading Zone. Fixed dimensional area, common to all MRTDs, in which the machine readable data in the MRZ can be read by document readers.
ePassport (eMRP or Electronically enabled MRP)	A machine readable passport (MRP) containing a Contactless Integrated Circuit (IC) within which is stored data from the MRP-data page, a biometric measure of the passport holder and a security object to protect the data with PKI cryptographic technology, and which conforms to the specification of Doc 9303, Part 1.
IATA	International Air Transport Association. Is an international industry trade group of airlines headquartered in Montreal, Quebec, Canada (where the ICAO also happens to be headquartered, even though they are different entities). On behalf of its Members and the entire aviation industry, IATA works to ensure that new and enhanced security measures are effective, internationally harmonized and minimize disruption to passengers and shippers.
ICAO Doc 9303	International Civil Aviation Organization. The International Civil Aviation Organization (ICAO) has taken a leading role in the creation of Machine Readable Travel Documents (MRTDs) in co-operation with the International Standardization Organization (ISO). The Standards are contained in document 9303 of the ICAO.
IR	Infrared radiation or light is an invisible electromagnetic radiation that has a longer wavelength than visible light and is detected most often by its heating effect. Infrared describes the part of the electromagnetic spectrum with wavelengths between 700 nm and 1mm. *Near infrared* light is closest in wavelength to visible light and *far infrared* is closer to the microwave region of the electromagnetic spectrum. Infrared light has many technology and physics applications.

Table 1.1 Glossary of terms

Term	Definition
Kensington Security Slot	Also called a K-Slot or Kensington lock, is a small hole found on almost all small or portable computer and electronics equipment, particularly on expensive and relatively light ones. It is used for attaching a lock, in particular those from Kensington Computer Products Group, who are its originators. Locks are generally secured in place with a key or some mechanical PIN device and attached through a rubberized metal cable. The end of the cable has a small loop which allows the whole cable to be looped around a permanent object, such as a heavy table or other similar equipment, thus securing it in place.
LED	Light Emitting Diode. Semiconductor which emits light if connected to voltage.
MRTD	General Term for all Machine Readable Travel Documents. Official document issued by a State or organization which conforms to ICAO Doc 9303 specifications and which is used by the holder for international travel (e.g. Passport, Visa, MRTD, ID cards) and which contains mandatory eye readable data and a separate mandatory data summary in a format which is capable of being read by machine.
MRZ	Machine Readable Zone. Fixed dimensional area located on the MRTD, containing mandatory and optional data formatted for machine reading using OCR methods.
OCR	Optical Character Recognition. It is the mechanical or electronic translation of images of handwritten or typewritten text on paper into machine-editable text. It is scanned with a computer (NCI) and converted to an editable text document (CI). OCR is already being used widely in the legal profession, where searches that once required hours or days can now be accomplished in a few seconds.
OCR-font	OCR font is the term given to a set of special typeface style developed for Optical Character Readers and Optical Character Recognition software. Each character within a font will have a defined reproducible size and shape. For OCR, these are defined by ISO 1073-II and OCR-B is preferred. OCR fonts are standardized and designed to be both machine and human readable. Some examples of OCR implementations include bank checks, passports, serial labels and postal mail.
RFID or RF	Radio Frequency Identification (RFID) is a method of identifying unique items using radio waves. Typically, a reader communicates with a tag, which holds digital information in a microchip. But there are chipless forms of RFID tags that use material to reflect back a portion of the radio waves beamed at them. As well as the standard passport data already included, this can also be used to store biometric features. The basic technical specifications of the RF chip for use in passports have been standardized by the ICAO.
RMA	A **R**eturn **M**erchandise **A**uthorization or **R**eturn **M**aterial **A**uthorization is a transaction whereby the recipient of a product arranges to return goods to the supplier to have the product repaired or replaced or in order to receive a refund or credit for another product from the same retailer or corporation.
Smart Card	A Smart Card, chip card, or integrated circuit card (ICC), is defined as any pocket-sized card with embedded integrated circuits which can process information. The card is made of plastic, generally PVC, but sometimes ABS or polycarbonate. The card may embed a hologram or other security features to avoid counterfeiting. Smart Cards are defined according to the card data read and wright features and the type of chip implanted within the card. There is a wide range of options. The most common type of Smart Card is the contact Smart Card where electrical contacts located on the outside of the card connect to a card reader when the card is inserted. Contact Smart Cards are standardized in ISO/IEC 7816. Contactless Smart Cards employ a radio frequency (RFID) between card and reader without physical insertion of the card. Instead the card is passed along the exterior of the reader and read. Contactless Smart Cards are standardized in ISO/IEC 14443.

Table 1.1 Glossary of terms

Term	Definition
UV	Ultraviolet (UV) light is represented in the light spectrum as light with a wavelength of 200nm to 400nm. The UV spectrum is divided into three regions: the near ultraviolet, the far ultraviolet, and the extreme ultraviolet, all of which are present in natural sunlight. These waves are invisible to the human eye.
VIZ	Visual Inspection Zone. Those portions of the MRTD (data page in the case of MRP) designed for visual inspection, i.e. front and back (where applicable), not defined as the MRZ.

2 Installation

THIS CHAPTER DESCRIBES THE D SCAN AUTHENTICATOR AND HOW TO INSTALL THE DOCUMENT AUTHENTICATION READER.

D SCAN AUTHENTICATOR

The D SCAN Authenticator is a compact full-page document reader. Some of the following characteristics require additional software functions which might be contained in D SCAN Extensions or are project-specific.

The document authentication reader has the following characteristics:

- Captures images of an entire data page of an ID document and to read RFID tag data contactless using a RFID Transceiver.
- Reads RFID and optical data of an ID document in one step without the need to re-position the document. The *One Step* scanner.
- Checks the authenticity of security elements of ID documents by comparing the differently lit images (visible, IR, and UV light).
- Uses high-speed data capture and transmission over the USB 2.0 interface.
- The single RFID antenna covers the entire document support area, so the Read function is not affected by the position of the chip inside the document.
- The optical scanning area allows inspection of documents without removal of the protective cover.
- Four LEDs can provide visible indications about the current mode of the document reader. A acoustic signals provide audible feedback to the user during the capture process.
- The document holder keeps large documents like passports in position during the capture process and allows hands-free operation.
- It is configurable to perform all scanning and checking functions in a fully automatic mode with no operator intervention.
- The configurable Flex detection mode processes documents anywhere on the document support area.
- There are no moving parts, which ensures maximum reliability.
- Complies with ISO standards.
- Special software controls the functional operation and the display of results.
- The power switch turns off the device completely.
- The optional installed Smart Card reader provides a contact interface that allows the device to read the chip data of ID cards.
- The optional installed Magnetic stripe reader provides a contact interface that allows the device to read the magnetic stripe data of ID cards.

Front view

Figure 2.1 D SCAN Authenticator front view

Table 2.1 Front features

#	Description
1	Ambient light cover. The cover reduces outside light during operation and protects the document contact area.
2	Document support area. The glass bearing surface where you put the documents to verify. The entire document support area is covered by the RFID antenna.
3	Document holder. The holder keeps large documents in position during reading process, see Figure 2.2 for example. The ambient light cover has been removed to better show the details.
4	Status lights. Four LEDs can provide visible indications about the current mode of the document reader. The lights can be used in different methods.
5	Instruction symbol. The symbol informs the user in principle how to move a document for authentication in the exact final position.
6	Smart Card slot. The optional integrated contact smart card reader allows maximum application comfort to read the data on the chip of a card.
7	Mag Stripe Reader slot. The optional integrated Mag Stripe reader allows maximum application comfort to read the data on the magnetic stripe of a card.

Figure 2.2 D SCAN Authenticator document holder

Back view

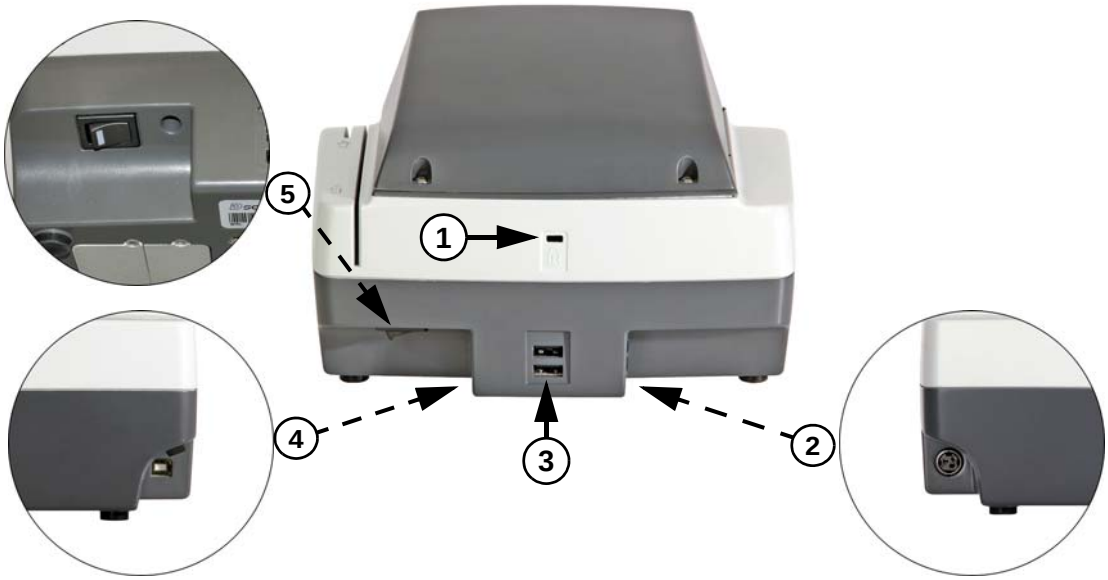


Figure 2.3 D SCAN Authenticator back view

Table 2.1 Back features

#	Description
1	Kensington security slot. Used to secure the unit in place with a key and attached through a rubberized metal cable. The end of the cable has a small loop which allows the whole cable to be looped around a permanent object, such as a heavy table, to secure it in place.
2	Power connector. Connects the power source to the Authenticator and supplies 12 V DC to operate the document reader.
3	USB connectors. Two USB 2.0 High Speed interface connectors allow connection to external devices.
4	USB-B connector. The USB 2.0 High Speed interface cable connects the Authenticator to the computer and delivers the captured data to the computer.
5	Power switch. The power switch turns the device on and off. It is backlit green in the ON position.

Product label

A label on the bottom of the device contains information on:

- The Manufacturer,
- The Product Name,
- The Model Number,
- The Serial Number,
- The Connection Values,
- The FCC Compliance,
- The CE Compliance,
- Other Certification Symbols.

The Version No. indicates the revision number of the device. Below the barcode abbreviations are used, which indicates the installed options.

- L - UV light
- **R** - RFID reader
- M - Magnetic Stripe Reader
- S - Smart Card Reader

Figure 2.4 D SCAN Authenticator product labels

System requirements

The D SCAN Authenticator can be connected to a computer using the USB 2.0 High Speed interface. This section describes the minimum system requirements for the document reader.

Operating system

- 32 or 64-bit Windows® XP / Vista / 7
- D SCAN Essentials Runtime

Hardware

The minimum requirements applies to desktop and laptop computers.

- Intel Pentium 2 GHz or higher processor (or equivalent x86 compatible CPU)
- 1 GB RAM
- 100 MB free hard drive space
- USB2.0-compliant ports or USB 2.0 PCI/PCMCIA card
- 1024 x 768 Video-Resolution monitor

Installation

This section describes how to install the D SCAN Authenticator.

Remove the contents

Note

Keep all original materials in the event you return the document reader.

Remove all the contents from the product package.

List of contents

The following items are included in the product package:

- D SCAN Authenticator document authentication reader
- External power supply unit
- Shielded and TID certified USB 2.0 A-B signal cable

Prepare to use

Make sure that the following conditions exist before you use the D SCAN Authenticator.

- After transportation or storage at low temperature, allow the reader to adjust to the temperature at the location of operation.
- The product is on a level surface.
- The surface of the document support area is clean and dry.
- The document reader is protected from dust and humidity.
- All sharp and pointed objects are kept away from the document support area surface.

Connect the Authenticator

The connectors are at the back of the device. Use the following procedure to install the Authenticator power and USB cables. The procedure applies to desktop and laptop computers.

1. Put the device on a clean flat area like a table.
2. Get the USB and power cables.

Note

Before you connect the power cable make sure that the power switch (3) is in the OFF position.

3. Connect the power cable (1). The flat part (1a) of the cable connector must point to the top for the correct orientation.

.

Figure 2.5 D SCAN Authenticator connectors

4 Connect the USB 2.0 cable (2). Use only a shielded and TID certified cable.

.

Figure 2.6 USB certification labels

5 Connect the power supply to the AC electrical outlet.

Note

Before you connect the D SCAN Authenticator to the USB port of your computer you must install the D SCAN Essentials software. The software provides the required hardware drivers during the D SCAN Authenticator installation.

6 Connect the other end of the USB cable to the USB 2.0 port of your computer.

7 Turn the power switch (3) to the ON position. The integrated LED lights green.

.

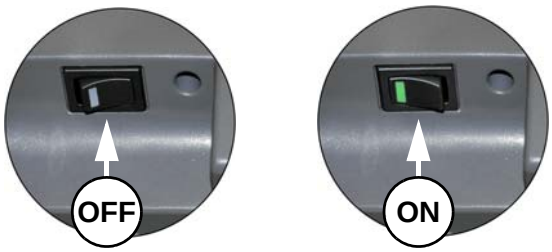


Figure 2.7 Power switch

8 You have completed the procedure.

You can use any USB port to plug in the Authenticator. However, the first time you plug the device into a particular port, Windows will install the driver for that device again.

Note

Use a portable computer with external power supply only. It guarantees that the voltage of the USB port is not less than 5 V DC.

The Authenticator status lights

Four LEDs on the Authenticator give status and feedback to the user during the document reader operation. They are used to show the operator process and quality checking information and can occur either as steady or flashing indications.

The following section explains the default status light indications. Your software controls how the status lights can be used in different methods. However the operation of the D SCAN Authenticator is always the same.

When the Authenticator is turned on the boot sequence starts. Each step of the boot process uses three LEDs in different combination (1, 2, 3).

Note

Only two or no LED are on during the boot process indicates an LED error.

When the boot process is complete the yellow LED indicates the standby mode (4). The device is turned on but either the USB cable is not connected or the device driver is not loaded.

The green LED illuminates when the device is successfully initialized by the software and the Authenticator is ready to scan.

.

Figure 2.8 Authenticator status lights

The following table contains the available status light combinations which can be used with the Authenticator.

Table 2.2 Default LED indications

#	Device status	Green	Yellow	Red	Blue
1	Boot sequence step 1	OFF	ON	ON	ON
2	Boot sequence step 2	ON	OFF	ON	ON
*	Boot sequence step 3	ON	ON	OFF	ON
3	Boot sequence step 4	ON	ON	ON	OFF
*	Boot sequence step 5	OFF	OFF	OFF	ON
*	Boot sequence step 6	OFF	OFF	ON	OFF
4	Powered / Standby	OFF	ON	OFF	OFF
5	Initialized / Ready to scan	ON	OFF	OFF	-
*	Copying calibration file to computer	ON	Flashing	OFF	OFF
*	Detecting motion	ON	ON	OFF	-
*	Image processing	ON	OFF	ON	-
*	Reading RFID	ON	-	-	Flashing

* These LED conditions are not shown as an image and reflect the configuration of the device. Some of them are explained in Chapter 3 “How to use the D SCAN Authenticator” when they occur during the document reading process.

- LEDs marked with a dash are independent from the related process.

Background correction images created during manufacturing are stored on the Authenticator. However they will be stored automatically on the connected computer during the boot process. Each set of background correction images stored on the computer is overwritten with the new one when:

- You connect a new Authenticator or one returned from service.
- You replace the computer connected to the Authenticator.

Also during the boot procedure of the Authenticator a self-calibration of the device is processed. The complete boot process takes up to one minute.

Attach the Authenticator to a surface

You can attach the Authenticator to a flat surface like a table or counter top. The document reader has four threaded mount points on the bottom of the case. Use the drill template on page -11 to mark the holes.

Prepare the installation

Make sure that the following conditions exist before you begin:

- The Authenticator is on a level surface.
- You collect the necessary pieces (drill template, four screws M4) and the tools required for the surface you selected.
- You read the Authenticator User Manual.

Installation

To attach the Authenticator:

1 Put the drill template in position.
2 Mark the center of each hole.

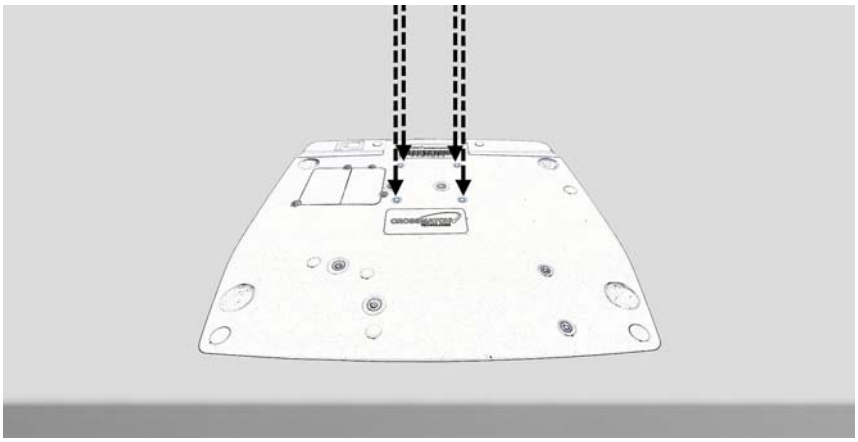


Figure 2.9 Place the drill template

3 Remove the drill template and make four holes.
4 Put the Authenticator above the holes.

Figure 2.10 Mount points

1 Use M4 metric screws to fasten the Authenticator. The mount points on the document reader are 0.295 inches (7.5 mm) deep.

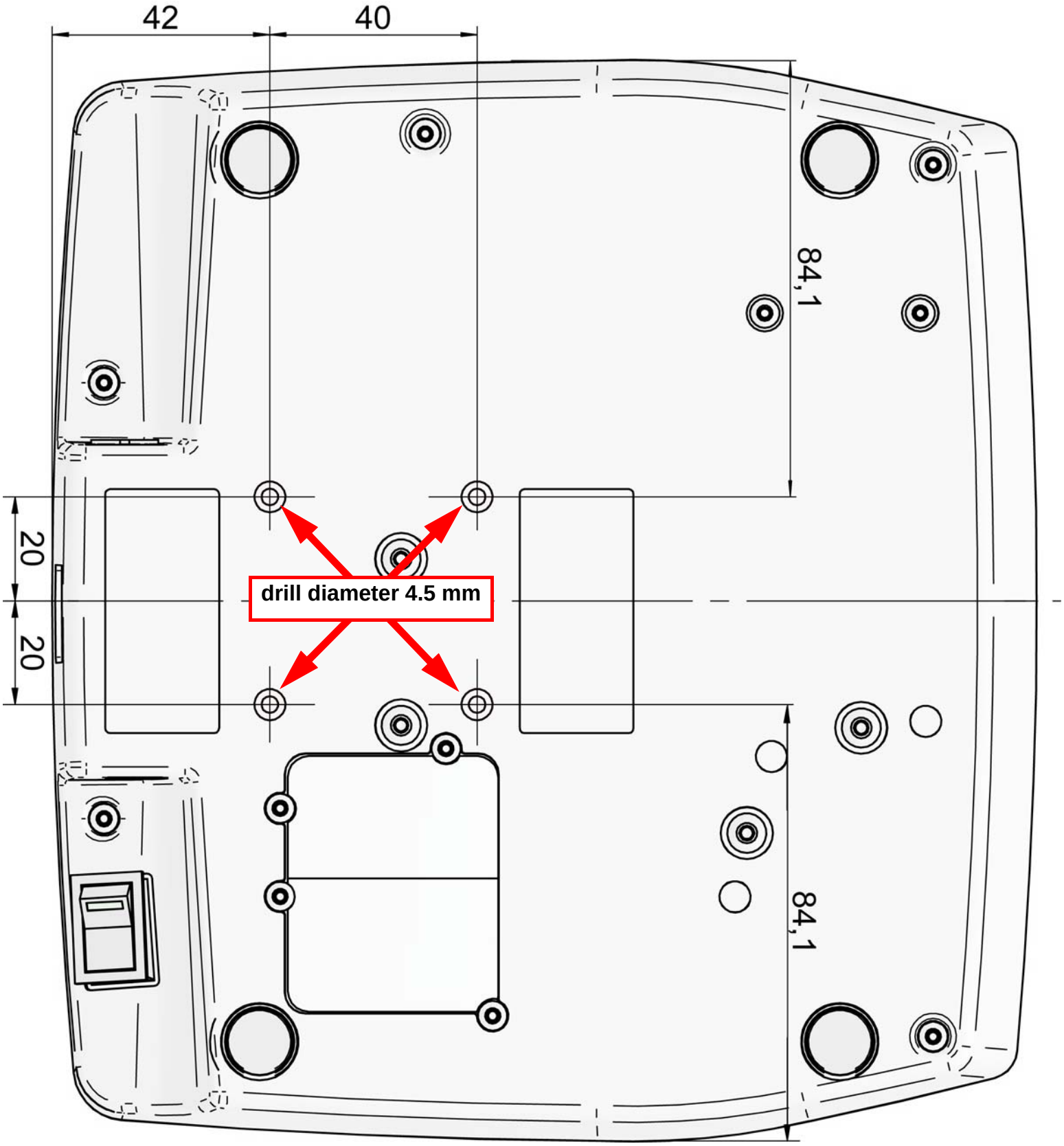
Caution

Make sure that the screws do not extend more than 0.295 inches (7.5 mm) above the surface. Longer screws will damage the bottom of the device.

2 Attach the device to the surface with the four screws.

Figure 2.11 Fasten the Authenticator

1 You have completed the procedure.


42
40
84,1
20
20
drill diameter 4.5 mm
84,1

Drill template

scale 1:1, use a borderless print method

Note

Do not choose the option <Fit to page> in the printer properties dialogue.

3

How to use the D SCAN Authenticator

THIS CHAPTER DESCRIBES THE FIELDS OF APPLICATION, THE CHARACTERISTICS OF DOCUMENTS AND HOW TO READ A DOCUMENT WITH THE D SCAN AUTHENTICATOR USING THE D SCAN EXTENSIONS DEMO APPLICATION.

Applications and software levels

The D SCAN AUTHENTICATOR is available with two software levels, the D SCAN Essentials and D SCAN Extensions to allow easy integration into existing systems on different levels of completeness. Each software level exists as a runtime license and an SDK license.

The D SCAN Essentials runtime software is provided for every document reader. The software is necessary to access D SCAN Authenticator devices on a fundamental functional level. This applies for high level document authentication software from D SCAN Extensions series as well as for direct device access by system integrators.

D SCAN Essentials software allows low level access to the device:

- USB driver
- Illumination selection and turn on/off, image capturing, RFID reader access on APDU (Application Protocol Data Unit) level
- Human interface control (buzzer and status LEDs)
- Optional SDK recommended for system integrators with experience in document processing.

D SCAN Extensions software allows high level functionality:

- Business method level to access images
- Verification of security features and RFID access on data group level
- OCR functionality and internal implementations of cryptographic protocols
- ICAO Doc 9303 default document definition

Optional SDK with tools for the implementation of protocols like BAC, EAC, PA, and AA.

Using the D SCAN Extensions software and/or additional customized functions the following main applications, without the demand of completeness are:

Airports

- Airline check-in and boarding, automated check-in
- ID verification at the time of check-in
- Creation of reference data for passenger tracking
- Faster, more precise and more efficient passenger handling

Rental car companies

- Check-in
- Verification of ID documents
- Verification of driver’s licenses
- Automated check-in for pre-registered customers

Banks

- Verification of ID documents
- Search against blacklists
- Transaction automation

Hotels

- Check-in
- Automated check-in for pre-registered guests
- Reading personal data from ID documents of guests and transmitting to authorities

Border control

- Automated border control
- Authentication of ID documents
- Providing reliable and efficient border control

Mobile Communications

- ID verification of customers
- Search against blacklists
- Contract automation

Characteristics of documents

General properties of Machine Readable Travel Documents are standardized in ICAO Doc 9303. This includes the structure, font, and location of the Machine Readable Zone (MRZ), MRZ check digits, and some UV properties of the document paper to be used. With the D SCAN Extensions software, these features are always checked. Images in all available illuminations are always captured accordance with the installed hardware options.

The default document recognition and check software works with ICAO 9303 compliant documents of ID1, ID2, and ID3 format. A machine readable zone (MRZ) must be exactly as specified in Doc 9303, with special attention to the OCR-B font.

Additionally, documents, which are not compliant with ICAO specifications, can be detected and can be taught to the system on request.

The machine readable zone

The ICAO Doc 9303 standard defines the Machine Readable Zone (MRZ) of any Machine Readable Travel Document (MRTD). The position and dimensions of the MRZ is different for every document type (e.g Passport, Visa, ID Card). The certain definition for each document type can be found in ICAO Doc 9303. As an example the MRZ for an Passport according to the ICAO Doc 9303 standard is illustrated in the following graphic:

- 23.2 mm (0.91 in) height from the lower edge of the document
- Over the total width of the document
- It spans two lines and each line is 44 characters long

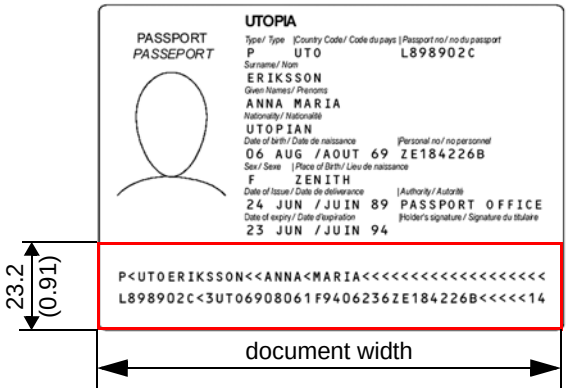


Figure 3.1 The machine readable zone

The document support area of the D SCAN Authenticator goes beyond the ICAO-MRZ. In customer specific applications, it is also possible to read zones outside the MRZ of documents which do not meet the requirements of ICAO Doc 9303 as long as the physical conditions (font, size, printing quality, lamination, etc.) of the document to be inspected allow this.

Position the documents

An instruction symbol (1) on the right side provides principle information for the user how to place a document on the document support area. The correct final position is along the right (R) and the back (B) part of the document support area.

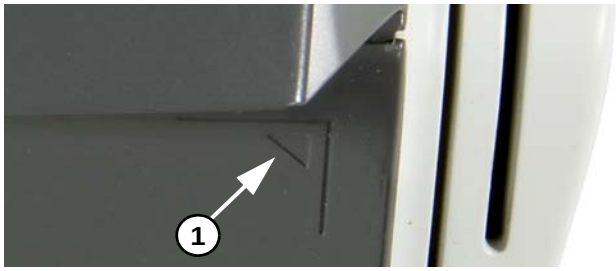


Figure 3.2 Instruction symbol

1. Put the data page face down on the document support area.
2. Move the document along the right part of the document support area until it stops. The document slips beneath the document holder (2) that keeps the document in position during the reading process. Lift the front of the document holder to put thicker documents in the reader.
3. Revers the procedure to remove the document.

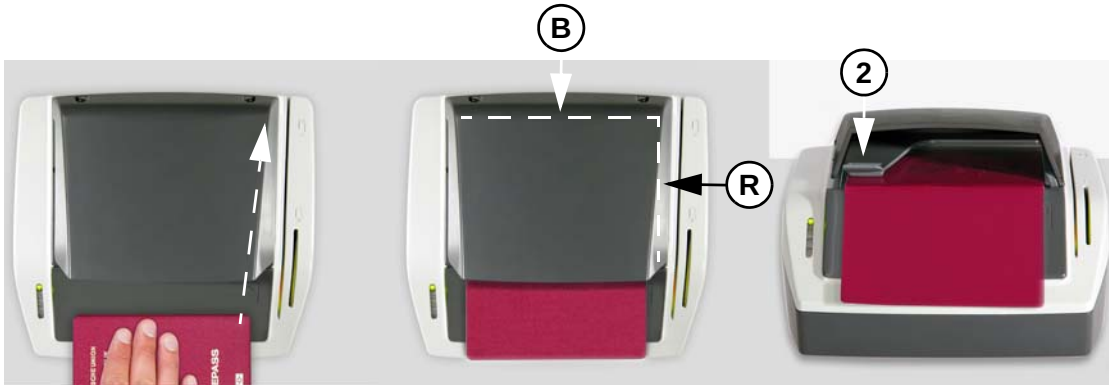


Figure 3.1 Placing on the document support area

Smart cards

The smart card reader is an optional feature. The corresponding slot is on the right top. It is the shorter slot (3) and is labeled with an icon.

1 Grasp the smart card so that the chip of the card faces to the outside.
2 Move the smart card in the slot at an angle of 45 degrees until it stops.

Figure 3.3 Insert a smart card

Magnetic stripe cards

The magnetic stripe card reader is an optional feature. The corresponding slot is on the right top. It is the larger slot (4) and labeled with an icon.

1 Hold the magnetic stripe card so that the magnetic stripe points down and faces away from the Authenticator.
2 Insert the card from the back into the slot.
3 Move the card through the slot until it is free.

Figure 3.4 Placing a magnetic stripe card

Read in a document

The following section describes a complete document reading process using the D SCAN Show Case application as an example and explains how to use the system correctly. The operation and display of results is controlled by the software as well as all functions.

Note

The D SCAN Show Case is only part of the D SCAN Extensions SDK software package.

Depending on your used software and your station policy, the computer screens may differ from this example. Also the status lights can be used differently. However the operation of the D SCAN Authenticator is the same.

Note

Before a document is processed make sure that the document support area is clean. Remove smudges, laminate glue, finger prints or other dirt that may blur the document being processed. Avoid touching the document glass with fingers prior to use.

The D SCAN Authenticator is easy to use:

1 Turn on the D SCAN Authenticator.

2 Turn on your computer.

3 Start the D SCAN Show Case application. The software initializes the D SCAN Authenticator and switches it to the Ready to scan mode.
   - Depending on the performance of your computer, start-up can take a few moments.

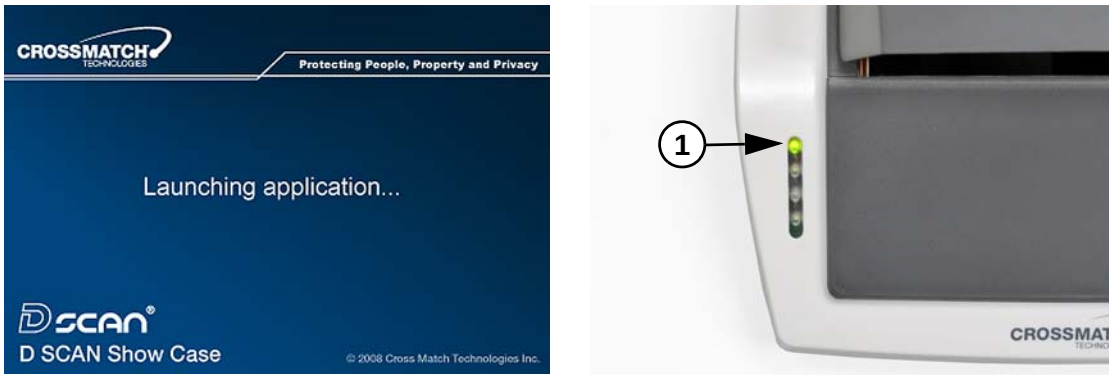


Figure 3.5 Launching application

- After successful initialization the *Overview* window appears. The green status light (1) is on and indicates the Ready to scan mode.

The Overview page

The Overview page is the default page that shows the data from the processed document. Use the Tabs at the top to navigate and to view all data and images.

1 Put the data page of the document to be read face down on the document support area.

Warning

Do not look directly into the lights of the document support area. Maintain a required minimum distance of not less than 11.8 inches (0.3 m).

2 A short acoustic signal indicates that the document is in the correct position. The processing starts automatically.
   - A processing bar (2) is shown at the bottom and the Image processing lights (3) are on. The image processing lights indicate that the data are recorded and processing is started.
   - If RFID data are available the Reading RFID lights (4) are on and processing is started.

Figure 3.6 Processing information

Note

Do not move the document until the yellow processing light turns off.

- When the document reader completes processing the document, the processing lights turn off, the green Ready to scan light comes on and a short acoustic signal occurs.
- You can remove the document.

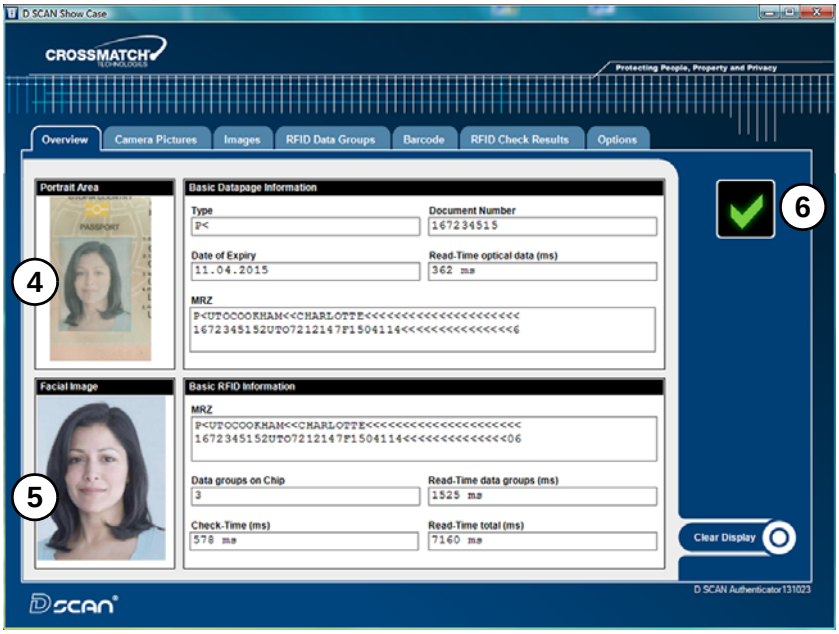


Figure 3.7 Overview data page

3 All data submitted to the computer are displayed on the computer screen.

- The upper part (4) shows the captured visible data, printed on the document.
- The lower part (5) shows the chip data stored on the RFID tag. This allows you to compare both data sections manually.
- An optional status icon (6) is shown on the right side.and indicates the operator quality checking information. This option can be disabled or enabled on the Options page. See "Global result settings" on page 3-11 for more information.

In the event of errors, failed verifications, or if the processed document is not recognized, the failed icon (7) appears.

- Use the Clear Display (8) button to clear the displayed data.
- Repeat the operation with the same document to make sure that the problem was not caused by mispositioning the document. Lift the document up and adjust the placement.

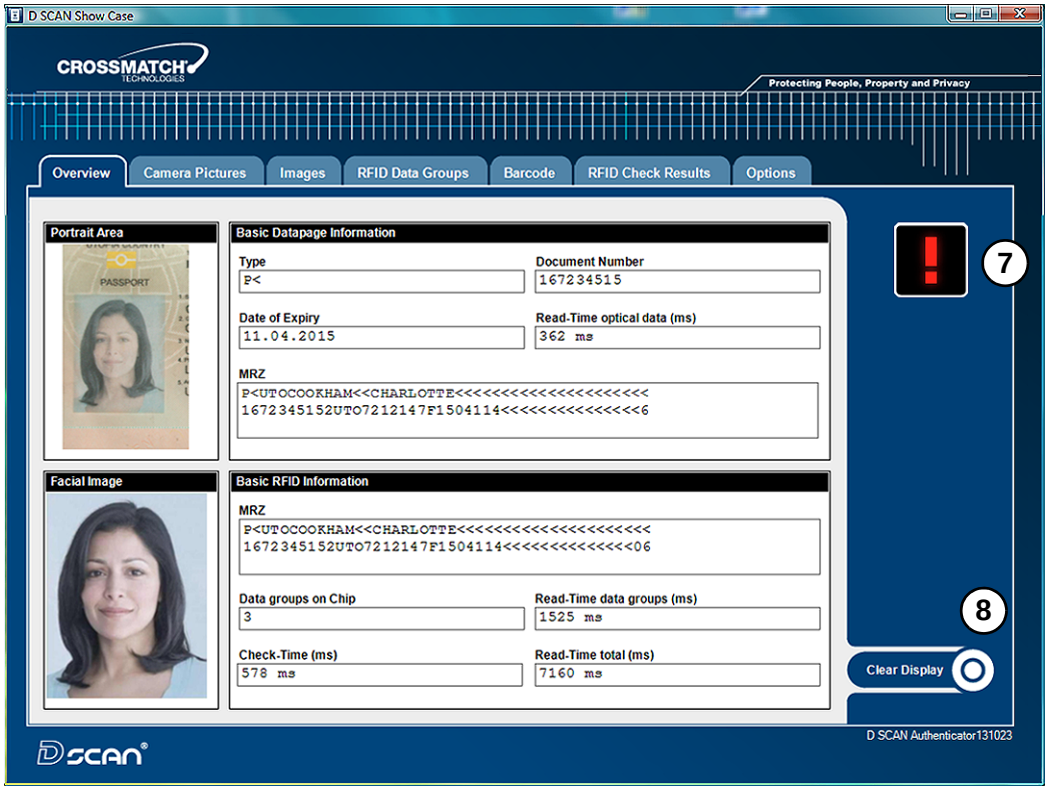


Figure 3.8 Failed verification

The camera pictures page

The Camera pictures page shows all available images captured under different illuminations depending on the features installed in the document reader. The upper image is the Master image. It allows the operator to mark an area of interest with the mouse cursor.

To mark an area:

1. Move the cursor to the desired position and press the left mouse button.
2. With the left mouse button pressed, draw a frame (1).
   - The dimensions of the frame will be proportional to the length and width of the image.
   - The content of the frame applies to all displayed images on the screen as a zoomed detail.
3. Move the cursor into the frame, then press and hold the left mouse button to move the frame to any place within the image.
4. All other images on the page adjust to the moved frame.
5. Click the right mouse button to delete the frame.

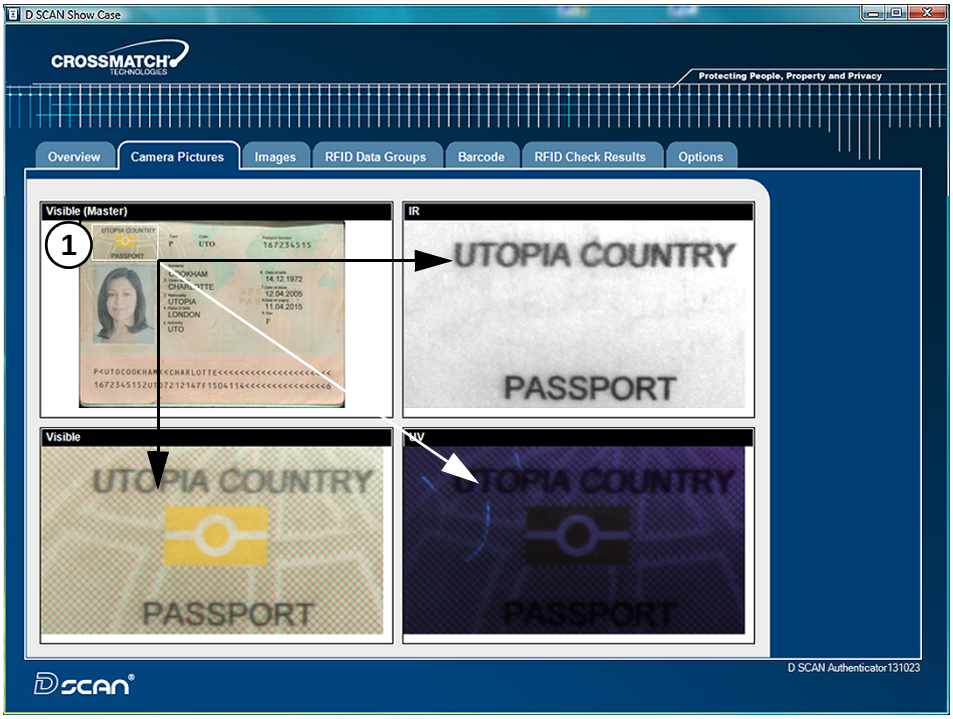


Figure 3.9 Camera pictures page

The images page

The Images page displays all available images in full screen resolution captured under different illuminations depending on the features installed in the document reader.

1. To select a single image click the down arrow in the Select box and chose the desired type of image from the list (1).
2. To view all images in sequence click on the left or right arrow (2) in the right upper corner of the image and scroll through all available images.
3. Put the mouse cursor in a displayed image and use the mouse wheel to zoom in or out. Press the right mouse button to stop the zoom function.
4. The Save (3) button stores the chosen image on your local disk.

Figure 3.10 Images page

The RFID data groups page

The *RFID Data groups* page displays all data groups in the Hex-Format found on the RFID tag.

1 To select a single data group click the down arrow in the Select box and select the desired type of data group from the list (1).
   - If no RFID data is available the Select box is grayed out.
2 To view all data groups in sequence click on the left or right arrow (2) in the right upper corner and scroll through all available data groups.
   - If the content of a data group is an image, it is displayed on the right sight (3) below the *Select* box.
3 The Save (4) button stores the content of the chosen data group on your local disk.

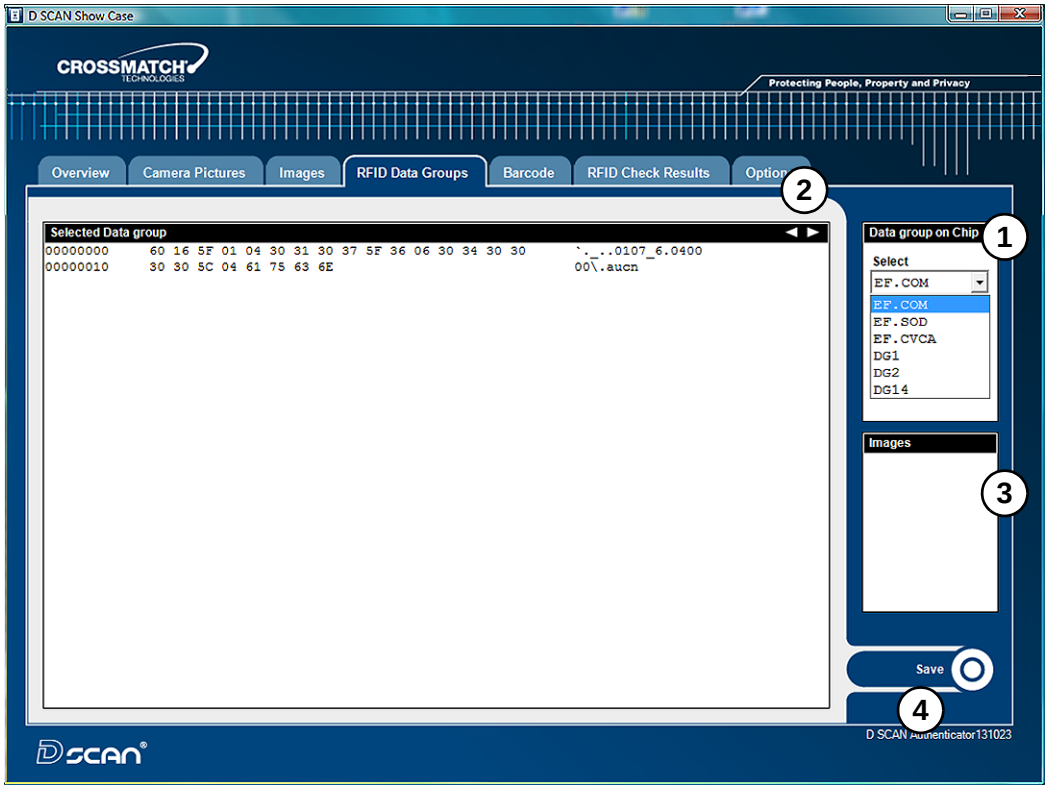


Figure 3.11 RFID data groups page

The barcode page

The Barcode page displays every barcode found on the document. As the default setting the PDF417 barcode is read. To read more barcodes use the *Barcodes to read* box on the Options page.

1 To read a single barcode, click the down arrow in the *Select* box and select the barcode from the list (1).
2 If no barcode data is available the *Select* box is disabled.
3 To view all the barcodes found, click on the left or right arrow (2) in the right upper corner and scroll through all the available barcodes.
4 The Save (2) button stores the content of the selected barcode on your local disk.

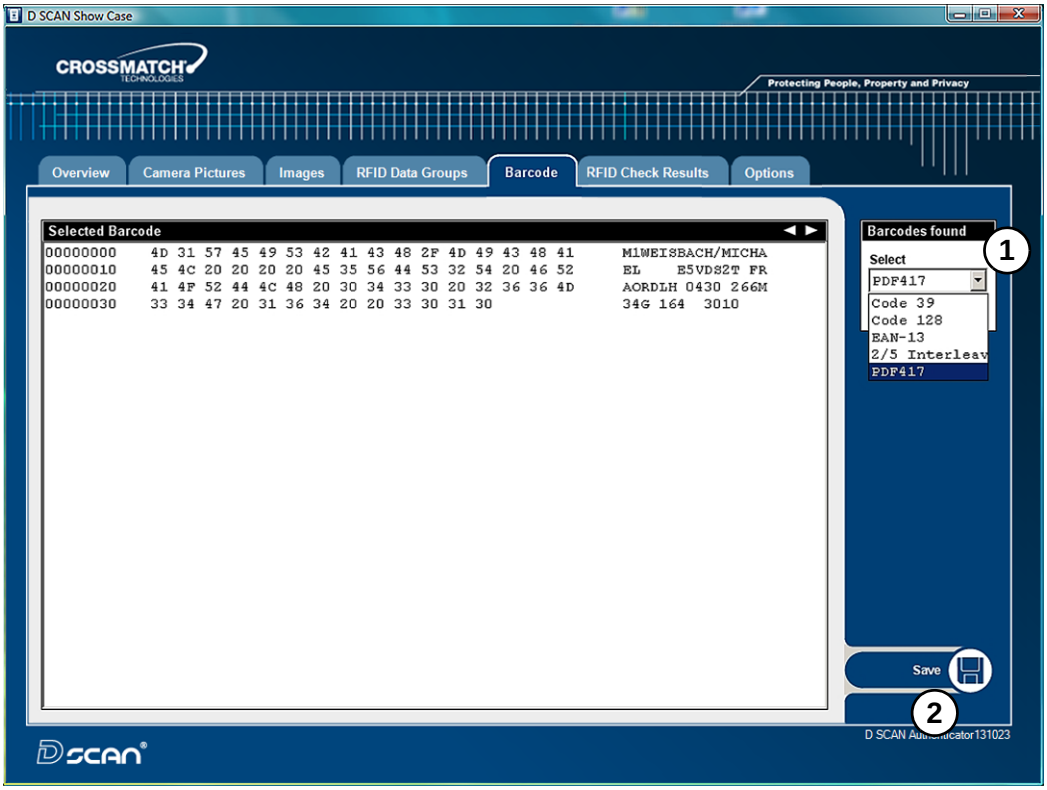


Figure 3.12 Barcode page

The RFID check results page

The RFID Check Results page shows the results of all performed security checks during processing the document. It may helpful to find out the reason for a failed security check.

- Green colored entries indicate successful security checks.
- Entries in red color indicate mistakes or failed security checks.
- The orange color indicates security checks or features which are not supported.

1 Use the scroll bar (1) to view longer lists.

2 The Save (2) button stores the list on your local disk.

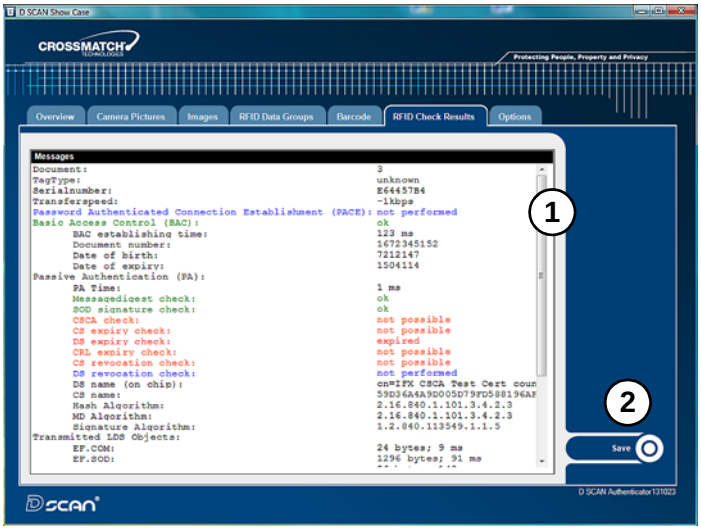


Figure 3.13 RFID check results page

The D SCAN Authenticator is ready to process the next document.

The options page

The Options page allows changes to the default settings of the program and to the appearance of functions.

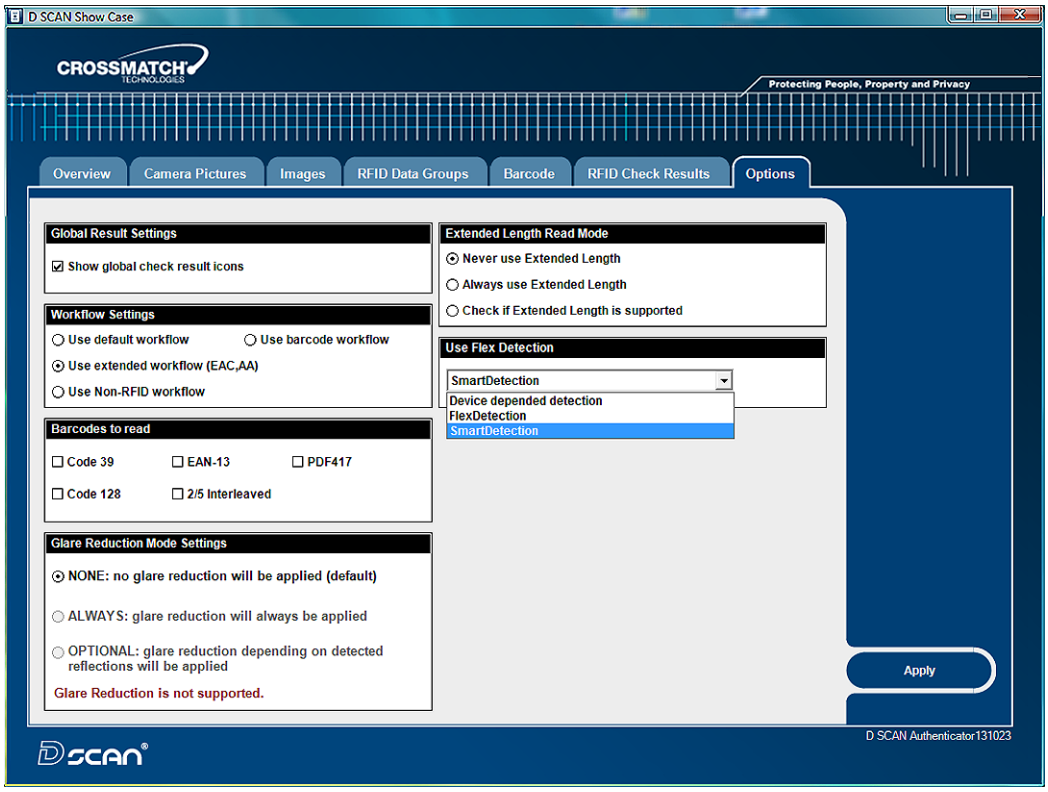


Figure 3.14 Options page

Global result settings

Two icons are used to show the operator quality checking information. The function to display the icons can be enabled or disabled and applies only for ID documents with MRZ.

Icon	Description
	The red Failed icon indicates that: • The MRZ check sums are not correct. • The document is expired. • The RFID data group read error in the RFID. • Any explicit error occurred during RFID verification.
	The green OK checkmark indicates that: • The MRZ check sums are correct. • The document is not expired. • The device read the RFID data successfully. • No explicit error occurred during RFID verification. • Another case occurred that is not listed above.

Work flow settings

In the default work flow, normal ID documents are scanned, including security checks, for:

- MRZ.
- RFID.
- Selected barcode type(s).

The barcode workflow can be used to demonstrate the reading speed of barcodes. Only the enabled barcode type(s) will be checked. The more barcode types are selected the longer the reading process

takes.

Barcodes to read

Set the checkmark for the barcodes to read.

Glare reduction mode settings

The glare reduction feature is not supported by the Authenticator device.

Extended length read mode

This mode allows the device to read more than 255 Bytes.

Use flex detection

The Authenticator can be configured to process documents placed on the document support area with different detection modes.

- Device depended detection. This setting is the default setting to process documents placed on any position.
- Flex detection. This mode allows the device to detect documents in any position and at any angle.
- Smart detection. In this mode the document reader reduces the light exposure when processing a document. It can be used to operate the device with the ambnient light cover removed.

4 Maintenance

THIS CHAPTER DESCRIBES MAINTENANCE PROCEDURES THAT INCREASE THE LIFE OF THE DOCUMENT READER.

Cleaning

Check the condition of the document support area each day. A clean document support area is required for proper operation. It avoids the transfer of communicable diseases and prevents dirt from reducing the image quality of the processed document. To clean the document support area use Alcohol Prep Pads or glass cleaning pads.

Caution

Do not use acetone, oil-based, abrasive or other unauthorized cleaners. This may damage the device and render it inoperable. Using unapproved cleaning solutions will void the warranty.

Clean the document support area

1. Open the package and remove the Alcohol Prep Pad.
2. Clean the document support area surface with the pad. Allow the surface to dry.
3. Use a Microfiber cloth to remove any remaining moisture on the platen until clean and dry.

Figure 4.1 Clean the document support area

Clean the case

Warning

Do not pour liquids (water etc.) onto the document reader. Use a damp cloth to clean the outside surface of the scanner.

To remove smudges, finger prints or other dirt, and grime:

1 Use a damp, soft, lint-free cloth.
2 Wipe the case.
3 Allow the outside surface to dry before the capture process is started.

Warning

Before you clean the case, disconnect the D SCAN Authenticator from the grounded outlet.

D SCAN AUTHENTICATOR specifications

Table 4.1 Product specifications

Item	Specification
Resolution	500 ppi
Sensor	5 MP CMOS RGB 24 bit Color
Illumination	White light, UV light, IR LEDs
Image type	RAW, BMP, JPG
Document support field size	5.4 in x 3.8 in (137 mm x 92 mm), document thickness is not limited
Active scanning area (WxD)	4.9 in x 3.5 in (125 mm x 88mm)
Document thickness	Not limited
RFID reader	Reading and writing contactless ICs according to ISO 14443 Type A and B, all standardized rates up to 848 Kbps
Smart card reader (optional)	ISO 7816 Class A, AB and C, ISO 7816 & EMV2 2000 Lev
Mag Stripe reader (optional)	Track 1, 2 and 3 stripes according to related ISO, ANSI and AAMVA standards
Reading protocols	ICAO Doc 9303 chips with LDS 1.7, CAC Cards
Crypto protocols	PA, AA, BAC EAC1.2, SAC (PACE)
Operating temperature	41 °F to 113 °F (+5 °C to +45 °C)
Humidity range	0 - 95% relative humidity
Dimensions (W x D x H)	7.5 in x 7.0 in x 5.0 in (190 mm x 178 mm x 128 mm)
Weight	2.4 lbs (1.1 kg), excluding cables and power pack
Data interface	High Speed USB 2.0, shielded cable
External interface	USB Hub with 2x High Speed USB 2.0 connections
Power supply	Wide range power pack, input AC 100-240 V, 50/60 Hz / 1.7 A, output DC 12 V / 5 A
Protection class	IP 43 * (IP 53 for optical channel) * when Mag Stripe and Smart Card reader slots are sealed with available caps
Regulatory	FCC, CE

Supplies

To order supplies for your D SCAN Authenticator, call Cross Match Technologies for price information.

5

Problems and Corrections

THIS CHAPTER CONTAINS COMMON PROBLEMS AND STEPS TO CORRECT THEM.

Do the procedures in this section before you contact the Cross Match Technical Support department.

The Authenticator does not work

The error messages displayed:

None. The yellow processing light is flashing.

First actions to correct the problem

1. Test the electrical outlet to ensure that the electrical outlet is working.
2. Check the correct installation of the power supply.
3. Verify that you use a certified USB cable and it is firmly connected to the computer.
4. Verify you use the USB 2.0 interface port of your computer.

More actions to correct the problem

1. Check the correct installation of the hardware driver.
2. Replace the USB cable to find out if it is defective.
3. Contact the Technical Support department.

Authenticator disconnected during operation

The error messages displayed:

A broken connection message depends on your software configuration.

The yellow LED is on.

First actions to correct the problem

1. Click OK to confirm the message Connection broken.
2. Establish the USB connection.
3. Connect the power to the Authenticator.
4. Initialize the Authenticator again.

More actions to correct the problem

Contact the Technical Support department.

Initialization failed

The error messages displayed:

None. The yellow LED is on.

First actions to correct the problem

1 Verify the USB cable is correctly connected to the computer.
2 Initialize the Authenticator.

More actions to correct the problem

1 Restart the computer.
2 Initialize the Authenticator again.
3 Contact the Technical Support department.

Dark image sections

The error messages displayed:

None

First actions to correct the problem

1 Clean the document support area.
2 Make sure that you have no direct light exposure on the processing surface.
3 Verify the correct installation of all software and hardware components.

More actions to correct the problem

Contact the Technical Support department.

Visualization and processing speed too slow

The error messages displayed:

None

First actions to correct the problem

1 Verify the system requirements. See "System requirements" on page 2-4.
2 Verify that the port is not a USB 1.1 interface port.

More actions to correct the problem

Contact the Technical Support department.

Creating a problem report

If you cannot correct the problem, please use the D SCAN TestWizard to perform a complete interactive diagnostic of the system.

1 Start the D SCAN TestWizard.
2 Perform a complete system test.
3 Create a log file.
4 Save the log file.
5 Send the log file to the responsible Service Center.

6 Customer Care and Contact Information

THIS CHAPTER CONTAINS TECHNICAL SUPPORT INFORMATION FOR THE PRODUCT AND CONTACT INFORMATION FOR THE COMPANY.

Technical Support

The Technical Support department is available for the D SCAN Authenticator.

E-mail

Cross Match Customer Care offers free technical hardware support on-line during the warranty period, in the order that the requests are received.

Table 6.1 The Global Technical Support department addresses

Global
CustomerCare@crossmatch.com

If the warranty has expired, contact Technical Support by telephone or facsimile.

Telephone and facsimile

Customer Care is available at the following telephone numbers:

Table 6.2 The Global Technical Support department numbers

Global
Monday- Friday 8 am to 6 pm EST
Customer Care
Tel: **1.866.276.7761** (**Toll Free**)
Tel: 1.561.622.9210 (International)
Fax: **1.561.622.8769**

Free technical support is available by telephone or facsimile for the D SCAN Authenticator under the warranty. After the warranty has expired, technical support is available at a given cost per hour. Contact Technical Support for complete information.

The Technical Support for the software products and the services purchased from Cross Match Technologies is not included under the warranty. The Technical Support for other products is available at a given cost to the customer. Support for software development related questions is, up to a certain limit, usually included in every SDK purchase.

When you contact Technical Support, make sure that you can provide the following information:

- Company name
- Contact person

- The D SCAN Authenticator serial number (found on the bottom of product)
- The configuration of your PC workstation or laptop
- The error messages that appear on the screen
- The log file created by the D SCAN TestWizard and the test images.
- The used D SCAN software and version number

Return and repair of the D SCAN AUTHENTICATOR

You must have an RMA number to return a D SCAN Authenticator for repair or replacement. Contact the Technical Support department to request and receive an RMA number. Put the RMA number on the outside of the box and on the label.

Table 6.3 The addresses for product returns

North America and South America	Europe, Africa, Asia and Australia
Cross Match Technologies, Inc. 3960 RCA Boulevard, Suite 6001 Palm Beach Gardens, Florida 33410 USA RMA: Rnnnn.nnnn	Cross Match Technologies GmbH Service Department Unstrutweg 4 07743 Jena Germany RMA RMAnnnn

The product is sent to the correct department for service or replacement, then returned to the customer. Any product sent to Cross Match Technologies without an RMA number is returned.

Delivery costs

The product is in the warranty period

- The customer accepts all charges to send the product to Cross Match for service.
- Cross Match accepts all charges to return the product to the customer.

Customers inside the EU

- Cross Match accepts all charges to send the product to Cross Match for service and to return the product to the customer.

The product is not in the warranty period

The customer accepts all charges.

Note

You must return a product in the original boxes. If the original boxes are not available, contact the Technical Support department for instructions.

Contact information

Corporate Headquarters

.Cross Match Technologies, Inc.

3950 RCA Boulevard, Suite 5001

Palm Beach Gardens, FL 33410

USA

T: +1 (561) 622-1650

F: +1 (561) 622-9938

T: (866) 725-3926 (Toll Free)

General Mailbox: info@crossmatch.com

Sales Department: sales@crossmatch.com

Technical Support: CustomerCare@crossmatch.com

Corporate Web Page

www.crossmatch.com

7 Product Warranty

THIS CHAPTER CONTAINS THE TEXT OF THE PRODUCT WARRANTY.

Limited Warranty

Cross Match Technologies, Inc. and its subsidiaries (“Cross Match”) warrants that the Cross Match Product (other than customized software) you have purchased will be free from defects in material and workmanship in normal service and under normal conditions for a period of one year from the date of shipment. Normal service and normal conditions are defined in the Product documentation. This Limited Warranty is subject to the terms and conditions set forth below.

Repair or Replacement

Unless otherwise stated herein, the sole obligation of Cross Match and your exclusive remedy and recourse under this Limited Warranty is for Cross Match, at its sole election, to either (i) repair the suspected defective Product and return the same to you or (ii) replace the suspected defective Product, all on the terms set forth below. The repair or replacement will provide you with a Product which, in Cross Match’s opinion, performs consistently with its age and usage.

If you become aware that your Cross Match Product is defective in material or workmanship in normal service and under normal conditions during its one year Limited Warranty period, then you must promptly contact Cross Match’s Customer Care Center, describe the suspected defect in detail and request a Return Merchandise Authorization (“RMA”) number prior to sending the affected Product for repair or requesting a replacement product. Please see your product manual for more information on RMA’s. Unless otherwise specified by law, you will pay the freight to send the Product to Cross Match’s designated Service Center. Cross Match will pay the freight to return the repaired Product to you. Each repaired or replacement Product is warranted (as set forth herein) for the remaining portion of the original one year Limited Warranty.

THE FOREGOING CONSTITUTES YOUR SOLE AND EXCLUSIVE REMEDY AND CROSS MATCH’S SOLE AND EXCLUSIVE LIABILITY IN CONNECTION WITH YOUR CROSS MATCH PRODUCT, AND IS IN LIEU OF ANY AND ALL OTHER REMEDIES WHICH MAY BE AVAILABLE TO YOU.

Limitations

This limited warranty does not cover visits to repair the Cross Match product at your premises, or the commissioning of the Product on site. This Limited Warranty is not a warranty, guarantee or promise that your Cross Match Product will conform to its specification or will not fail. Some defects and failures are not covered.

Cross Match shall incur no liability under this Limited Warranty and this Limited Warranty is voidable by Cross Match if in Cross Match’s sole reasonable opinion: (a) the Product is used other than under normal use and under proper environmental and/or electrical conditions, as specified in the Product manual; (b) the Product is not maintained as specified in the Product manual; (c) the Product is subject to abuse, misuse, neglect, accident, flooding, storm, lightning, power surges, dirty

power, third-party errors or omissions, or acts of God; (d) the Product is modified or altered (unless expressly authorized in writing by Cross Match); (e) the Product is installed or used in combination or in assembly with products not supplied or authorized by Cross Match; (f) there is a failure to follow specific restrictions or operating instructions; or (g) payment for the Product has not been timely made.

This Limited Warranty includes software "updates" (a revision or minor change to a Product intended to correct defects and provided as a change in the then current release of the Product). Software updates may be made from time to time in Cross Match's sole discretion. This Limited Warranty does not cover software "upgrades" (a revision to a Product that adds new enhancements and functionality resulting in a new release of the Product) or any software product or interface customized by Cross Match to meet Purchaser's specific requirements or Purchaser furnished equipment or software. Software upgrades may be available for purchase from time to time at Cross Match's then current published prices.

This Limited Warranty does not provide additional hardware or computing platform software or its installation when required by Cross Match software supplied hereunder. If required, these may be obtained from Cross Match at the published prices in effect at such time.

The Limited Warranty does not cover nondurable consumable items including, but not limited to, batteries, paper, silicon pads, cleaning solution, towels, printer cartridges and cables. Replacement supplies of these items may be ordered by contacting Cross Match Sales at http://www.crossmatch.com/sales-contacts.php. This Limited Warranty does not cover third party peripheral equipment (such as laptops and printers) that are not provided by Cross Match.

Cross Match's obligations hereunder are contingent upon your providing the Product serial number as proof-of-purchase, and upon Cross Match's determination that the suspected malfunction is actually due to defects in material or workmanship.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES RELATED TO THE CROSS MATCH PRODUCT, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED BY CROSS MATCH. THIS LIMITED WARRANTY IS NOT TRANSFERABLE OR ASSIGNABLE TO ANY THIRD PARTY AND SHALL BE FOR THE SOLE AND EXCLUSIVE BENEFIT OF THE ORIGINAL PURCHASER OF THE CROSS MATCH PRODUCT COVERED HEREUNDER; ANY ATTEMPTED TRANSFER OR ASSIGNMENT HEREOF SHALL BE VOID AB INITIO.

Cross Match reserves the right to improve/modify products at any time, at its sole discretion, as it deems necessary.

Out-of-Warranty Repairs

When warranty coverage for your Cross Match Product lapses, or for repairs or replacements not covered by Cross Match's warranty, (i) you will pay for all repairs at Cross Match's then-prevailing hourly labor rate (with a one hour minimum) plus parts and shipping, (ii) you will pay Cross Match's then-current price for all replacement Products plus shipping, and (iii) you will pay Cross Match's then-prevailing hourly labor rate (with a one hour minimum after the first 15 minutes) for telephone support in 15 minute increments.

To obtain out-of-warranty service, you must obtain an RMA number and send the affected Product, at your expense, to the designated Cross Match Service Center for inspection. You will be contacted with an estimated price and time of repair or replacement after analysis. No repairs or replacements will be made until Cross Match receives a Purchase Order or credit card number from you. You shall pay return freight charges, which will be added to the invoice, for the return of the repaired Product or replacement Product.

In the event you decide not to have a unit repaired or replaced after receiving a repair estimate, there will be a one hour labor charge at the prevailing hourly rate for evaluation plus return freight charges.

At your request, Cross Match will, for a premium, ship a refurbished unit to you in exchange for the failed unit. Cross Match will contact you with a price for the exchange after receipt of the failed unit. The shipment will be made when Cross Match receives a Purchase Order or credit card number from you. You will pay return freight charges, which will be added to the invoice, for the exchange unit. The original returned Product will become the property of Cross Match and will not be returned to you. The refurbished unit will retain the remaining warranty term of the original returned Product.

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CROSS MATCH TECHNOLOGIES, INC.

Cross Match is a leading provider of biometric identity management systems, applications, and enabling technologies to governments, law enforcement agencies, and businesses around the world.

Offerings include multiple biometric technologies that encompass fingerprint, palm and full-hand scanners, facial recognition systems, iris scanning technology, document readers, biometric software, and related services.

The Worldwide Standard in Biometric Identity Solutions

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