CROSSMATCH
TECHNOLOGIES

D SCAN® AUTHENTICATOR CF™
Document Authentication Reader

User Manual

Protecting People, Property and Privacy

Cross Match® Technologies, Inc.

D SCAN® AUTHENTICATOR CF™
Document Authentication Reader

User Manual
Version 2.1

Basic health and safety instructions

The D SCAN® AUTHENTICATOR CF document reader is designed, manufactured and tested to meet international safety standards. The document reader contains an RF transmission device, and is therefore subject to national and international regulations. The Authenticator transmits at a frequency of 13,56 MHz. However, all electric appliances can emit spurious RF-signals at other than the specified frequency.

To ensure safe operation of the D SCAN AUTHENTICATOR CF:

- The operator of the D SCAN AUTHENTICATOR CF must observe the guidelines and particularly the safety precautions outlined in this document and according to related country regulation requirements.

- You must restrict the use of the device in potentially hazardous environments. The environments include fuel depots, chemical plants and areas where the air contains chemicals or particles (such as grain, dust, or metal powders). The restrictions apply in any other area where you would normally be asked to turn off your vehicle engine.

- Transmitted radio frequency energy may interfere with some hearing aids, pacemakers or other medical devices if the person is positioned too close to the document reader.

- To reduce the RF exposure refer to your related country regulation requirements. See the specifications table and the section **"Magnetic field strength" on page 4-3** for detailed information.

- Read the User Manual on the CDROM for detailed information to operate the D SCAN AUTHENTICATOR CF.

- Turn off the document reader when not in use.

- Do not open the device. Repairs must be done by Cross Match Technologies. Changes or modifications not expressly approved by Cross Match Technologies could void the user's authority to operate the equipment.

Cross Match Technologies GmbH assumes no liability for the customer's failure to comply with these requirements.

The optional coaxial light feature

The D SCAN® AUTHENTICATOR CF is a high performance device for reading all kinds of personal identification documents such as passports and national ID cards. Any document compliant to the specifications of the ICAO can be placed on the glass plate on top of the device for capturing the image of the personalized page. The optional RFID feature further provides the functionality for reading out the contents of the digital data chip contained in the new electronic passports.

How does the optical reading of the device work?

The D SCAN AUTHENTICATOR CF device contains a built-in high resolution camera and several sources of light. Each light source can be turned on before taking one image with the camera. Thereby the user can take an image of the personalized page as it appears under normal visible light or under ultraviolet (UV) or infrared (IR) light. In the interest of a very uniform intensity level of the light on the document page being captured the light sources are arranged in a way to provide a diffuse kind of light rather than a directed light under a specific angle. This is also helpful to avoid reflections. After the image was taken by the build-in camera it is being transferred through the USB 2.0 interface cable to the PC. The software belonging to the D SCAN AUTHENTICATOR CF receives the image and makes it available through the Application Programming Interface (API). Thereby the image becomes accessible for the application software of the system integrator.

Among the available options is the "coaxial light" feature. This is an illumination which works similar to the other ones but delivers its light under the same angle as the camera view angle to the document. Thereby camera and illumination are arranged on the same axis - or coaxially, hence the name.

## Which functionality does the coaxial light feature provide?

This optional feature provides the functionality of turning the coaxial illumination on while all other illuminations are off, taking one image with the camera, turning the coaxial illumination off, and making the captured image available as a digital bitmap via the API to the application software of the system integrator. The application can then take this image and display it on the screen of the PC so that the operator can view it.

A personalized page of a document covered with a protective laminate may show certain retro reflective patterns when viewed with the coaxial illumination. When viewed with one of the diffuse illuminations the same page will not show the retro reflective pattern. Thereby the existence of such a laminate can be checked visually.

The coaxial light product feature of the D SCAN AUTHENTICATOR CF does not provide any kind of image processing or image analysis e.g. intended for the automatic detection of tampering and alteration of documents having security laminates such as the 3M™ Confirm™ Laminates.

Cross Match Technologies does not provide any product option or product extension or separate product for performing such kind of automatic detections.
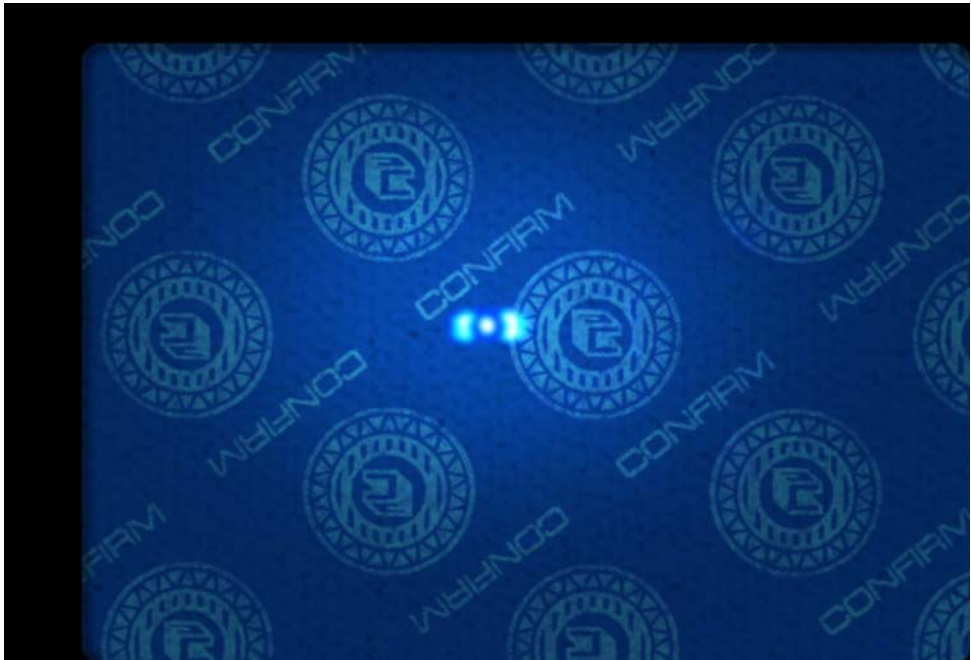
Image captured with an D SCAN AUTHENTICATOR CF under coaxial light showing a document having a 3M™ Confirm™ Laminate on top of the personalized page. The retro reflective marks are clearly visible while the underlying text and pictures are almost invisible.

Notice to system integrators

System integrators shall be aware that an automatic detection of tampering and alteration of documents having security laminates is the subject of a technical invention filed by Minnesota Mining and Manufacturing Co. and published as patent in the following countries: AU 685830, CA 2173230,   DE 69418 887 T2, ES 2133583 T3, FR 0722597, GB 0722597, HK 1013873, IT 0722597, JP 09504629 T2, KR 0354883 B, US 6019287, US 6611612, and US publication 2004-022420 A1.

Disclaimer

Cross Match Technologies explicitly reminds the integrators of the D SCAN AUTHENTICATOR CF of the existence of the above mentioned patents. The use of the D SCAN AUTHENTICATOR CF for reading documents with the coaxial light is authorized by Cross Match Technologies only for the purpose of taking the image without any kind of image processing for the automatic detection of tampering and alteration. Cross Match Technologies shall not be liable for any violation of the rights and claims of the patents mentioned above. System integrators and end users interested in performing such automatic detection shall consider to contact the owner of the above mentioned patents for a potential licensing.

This document applies to each D SCAN AUTHENTICATOR CF device if it is equipped with the coaxial lighting feature option (CX2). System integrators and resellers must provide this document to the end user.

Cross Match Technologies GmbH assumes no liability for the customer's failure to comply with these requirements.

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D SCAN® AUTHENTICATOR CF™ User Manual v2.1

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Introduction

Appropriate Operation

The D SCAN® AUTHENTICATOR CF 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 RFID data contactless found on the RFID tag.

It is intended for the use in IT-devices area 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 standard.

Who should read this book

You should read this book if you are a user and you will operate the D SCAN AUTHENTICATOR CF 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 CF and how to install the document authentication reader.
- **Chapter 3 "How to use the Authenticator CF"** 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 CF.
- **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.

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: WO8RJ0479V2

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 CF must provide an output voltage of 18 - 24 V DC. The electric current range of the power supply unit must be min. 1 A and max. 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.

Industry Canada

IC: 7944A-RJ0479V2

This Class B digital apparatus complies with Canadian ICES-003. 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.

The power source for the AUTHENTICATOR CF must provide an output voltage of 18 - 24 V DC. The electric current range of the power supply unit must be min. 1 A and max. 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 CF. 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 IEC 60950 standard.
- The power supply must be provided by an certified power supply unit with an output voltage of 18 - 24 V DC. The electric current range of the power supply unit must be min. 1 A and max. 7A. Use the desktop power pack which is provided with the product package.
- 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 CF. 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.
CX	Coaxial light illumination for image capture with light directed in the same optical axis as the image pick-up.

Table 1.1   Glossary of terms

Term	Definition
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 CF, 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.

Table 1.1 Glossary of terms

Term	Definition
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.
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 although use of 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.

Table 1.1 Glossary of terms

Term	Definition
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.
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.

Installation

D SCAN AUTHENTICATOR CF

The D SCAN AUTHENTICATOR CF (CF stands for **C**ompact **F**ull page) is a compact and small full-page document reader. Some of the following characteristics require additional software functions which might be contained in D SCAN Extensions or project specific.

The document authentication reader has the following characteristics:

- Capability to capture images of an entire data page of an ID document and to read RFID tag data contactless using a 13.56 MHz 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.

- The additionally installed card reader provides a contact interface, which allows the device to read the chip data of ID cards.

- Allows to check the authenticity of security elements of ID documents by comparing the differently lit images (visible, IR, UV and CX light).

- High speed data capture and transmission using the USB 2.0 interface.

- The single RFID antenna covers the entire document contact area, so the read function is not affected by the position of the chip inside the document.

- The extra large optical scanning area allows inspection of documents without removal of the protective cover.

- It can be configured to perform all scanning and checking functions in a fully automatic mode with no operator intervention.

- No moving parts and optional high-performance LED UV illumination ensure maximum reliability.

- The D SCAN AUTHENTICATOR CF complies with ISO standards and achieved excellent results in recent ICAO interoperability tests in Japan and Singapore in 2005, and in Germany in 2006, where they were able to read all presented passports.

- Special software controls the functional operation and the display of results.

Front view

Figure 2.1   D SCAN AUTHENTICATOR CF front view

Figure 2.2   D SCAN AUTHENTICATOR CF instruction label

Table 2.1 Front features

#	Description
1	**Ambient light cover**. The height-adjustable cover reduces outside light during operation and protects the document contact area when the device is not in use.
2	**Document contact area**. The glass bearing surface where you put the documents to verify. The surface is divided into the optical scan area and the document support area. The entire document contact area is covered by the RFID antenna.
3	**Smart Card slot**. The integrated contact smart card reader allows maximum application comfort and uses the ISO 7816 protocol Type T=0 (asynchronous half duplex character transmission protocol) and T=1 (asynchronous half duplex block transmission protocol) to read cards.
4	**Status LEDs and Buzzer**. Three LEDs can provide visible indications and a volume-adjustable buzzer provides acoustical indication about the current mode of the document reader. Using the D SCAN Extensions application the LEDs light as follows: • The backlit red light is the **Status light** and lights during the initialization process or when the device is not ready for operation. • The backlit yellow is the **Processing light** and lights when processing a document. During this time, no other documents can be verified. After processing it turns off, indicating that a new authentication can be started. • The backlit green is the **Operation light** and lights after the device is successfully initialized and when an authentication is completed. **Other programs can use the lights and the buzzer in different methods.**
5	**Instruction label**. The label informs the user in principle how to position and place a document correctly.

Top of the document reader

The following section contains important details of the top of the device with a brief description of each. The ambient light cover has been opened to better show the details.

Figure 2.3 Top view of the D SCAN AUTHENTICATOR CF

Table 2.2 Top features

#	Description
1	**Document position angle**. The document positioning angle helps to guarantee the exact final position of the document for authentication.
2	**Optical scan area**. The glass bearing surface where documents are placed to be verified. A dotted line shows the area where the device reads the document.
3	**Document support area**. The part of the glass bearing surface which is not used for scans. The area allows you to put larger documents down correctly. The area is covered by the RFID antenna.

Ambient light cover

The cover is attached by two bolts, one on each side, at the upper back of the
D SCAN AUTHENTICATOR CF. This allows three positions, closed (**1**),
operation (**2**) and open (**3**). To put the cover in one of these positions, lift the front
edge. Two ball catches hold the cover in the operation position.

Figure 2.4 Ambient light cover positions

Back view
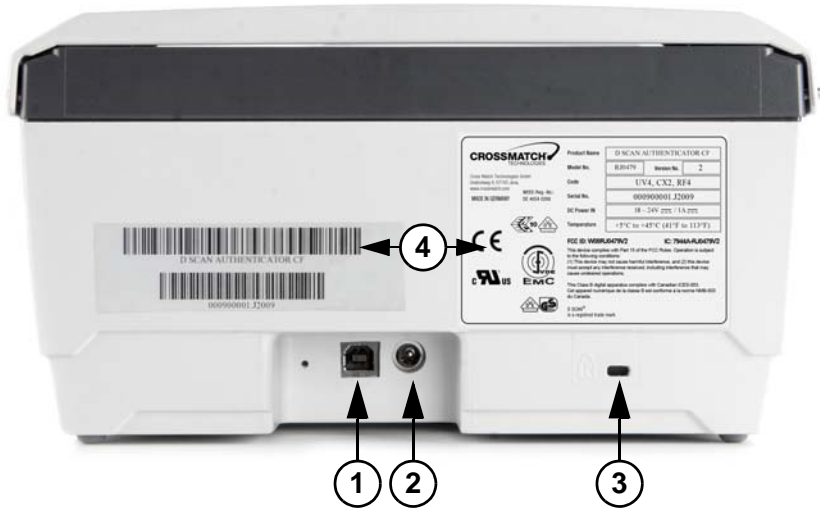
Figure 2.5 D SCAN AUTHENTICATOR CF back view

Table 2.3 Back features

#	Description
1	**USB-A connector**. The USB 2.0 High Speed interface cable connects the Authenticator to the computer and delivers the captured data to the computer.
2	**Power connector**. Connects the power source to the computer and supplies 19 VDC to operate the document reader.
3	**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.
4	**Device labels**. Shows manufacturer and product information.

Product label

A label on the back of the device contains information on Manufacture, Product Name, Model Number, Code Number, Serial Number, Connection Values, FCC Compliance, CE Compliance and other Certification Symbols. The field Code contains abbreviations, which indicate which illumination and RFID module is installed. The Version No. indicates the revision number of the device.
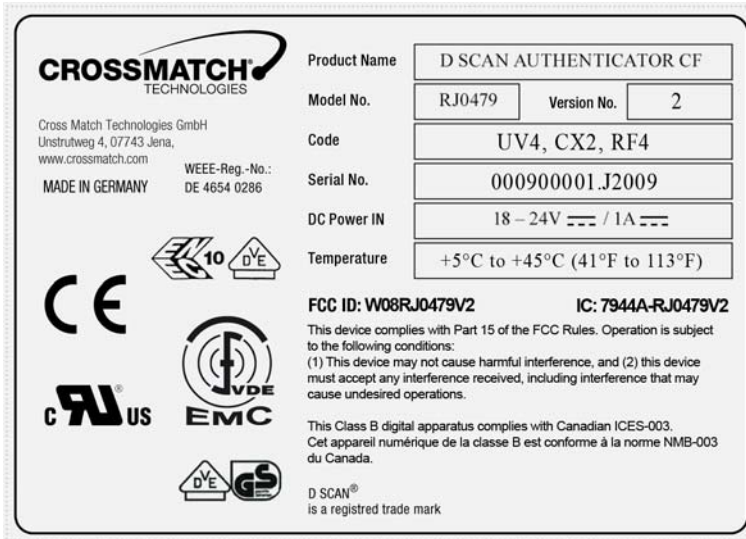
Figure 2.6   D SCAN AUTHENTICATOR CF product label

Table 2.4   Illumination codes

Code	Description
UV*	UV high performance LED illumination.
CX*	Coaxial light illumination (not available in all markets).
RF*	RFID data read-out functionality, incl. fully integrated antennas for front and back page(s).

* The number behind each code indicates the version of the code.

System requirements

The D SCAN AUTHENTICATOR CF 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

- Windows XP Professional, Service Pack 2
- Windows Vista 32, Service Pack 1
- Microsoft .NET Framework 1.1 should be installed
- D SCAN Essentials Runtime

Hardware

The minimum requirements applies to desktop and laptop computers.

- 2 GHz or higher processor with SSE2 instruction set (Intel Pentium 4 or Celeron or better, or AMD Athlon64 or better)
- 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 CF.

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 CF document authentication reader
- External power supply unit
- USB A-B signal cable
- D SCAN Essentials Runtime CD
- D SCAN AUTHENTICATOR CF User Manual on CD
- White/yellow test chart (creation of background images and calibration)

Prepare to use

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

- After transportation or storage at low temperature, allow the reader to adjust to the temperature at the location of operation.

- Store the document reader in a warm dry location.
- The product is on a level surface.
- The surface of the document contact area is clean and dry.
- Protect the document reader from dust and humidity.
- Keep all sharp and pointed objects away from the document contact area surface.

Connect the Authenticator CF

Note Before you begin, ensure that the device reached room temperature before powering on the device. The procedure applies to desktop and laptop computers.

The connectors are on a connection box at the back of the device. Use the following procedure to install the D SCAN AUTHENTICATOR CF USB and power cables.

The connectors are on a connection box at the back of the device. Use the following procedure to install the D SCAN AUTHENTICATOR CF USB and power cables.

1 Put the device on a clean flat area like a table, that is free of dust.
2 Get the USB and power cables.
3 Lift the back of the device. You see the connection box with the power (**2**) and USB (**1**) connectors.
4 Insert the cables into their related connectors in the connection box.

.

Figure 2.7 D SCAN AUTHENTICATOR CF connection box

5 Connect the power supply to the AC electrical outlet.

- All LEDs should flash on and off. The yellow LED flashes to indicate the standby mode.

Note When you apply power is applied to the D SCAN AUTHENTICATOR CF, it is permanently powered on. Unplug the device from the AC electrical outlet to completely turn the device off.

6 Connect the other end of the USB cable to the USB 2.0 port of your computer.
7 You have completed the procedure.

Note Before you connect the D SCAN AUTHENTICATOR CF 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 CF installation.

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

Attach the Authenticator CF to a surface

You can attach the Authenticator CF to a flat surface like a table or counter top. The document reader has four threaded mount points on the bottom of the case, which are covered by the rubber feet. Use the drill template **on page 2-12** to mark the holes.

Prepare the installation

Make sure that the following conditions exist before you begin:
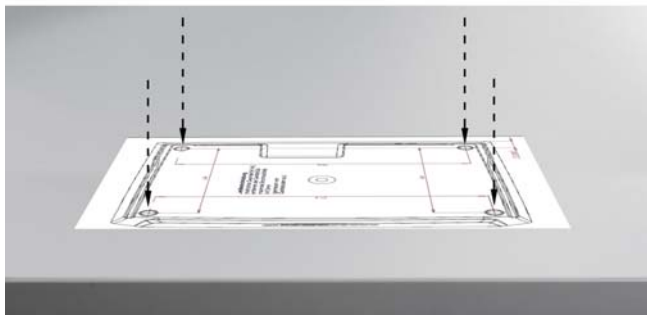
- The Authenticator CF is on a level surface.
- Collect the necessary pieces (drill template, four screws M4) and the tools required for the surface you selected.
- Keep a soft cloth handy.
- Read the Authenticator CF User Manual.

Installation

To attach the Authenticator CF:

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

Figure 2.8   Place the drill template

3 Make four holes.

4 Get the Authenticator CF and put it upside-down on a desk or table.

Note Protect the top of the device with a soft cloth and keep all sharp or pointed objects away from the surface.

Figure 2.9 Remove rubber feet

5 Remove all four rubber feet at the bottom. Lift the edge with your nail and pry them away. You have now access to the four mount points (**1**) of the device. Store the rubber feet in a safe place.

Caution Do not press on the device. This may damage the cover.
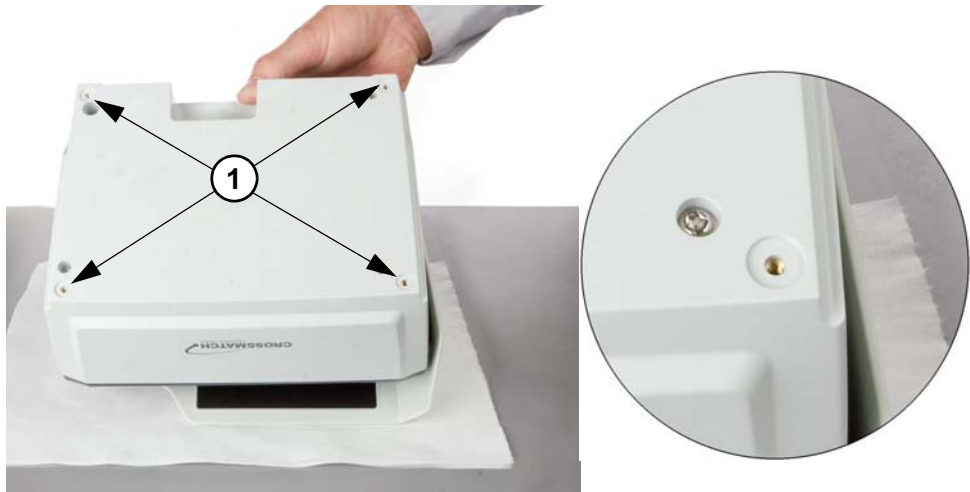
Figure 2.10 Mount points

6 Use M4 metric screws to fasten the Authenticator CF. 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.

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

Figure 2.11 Fasten the Authenticator CF

8 You have completed the procedure.
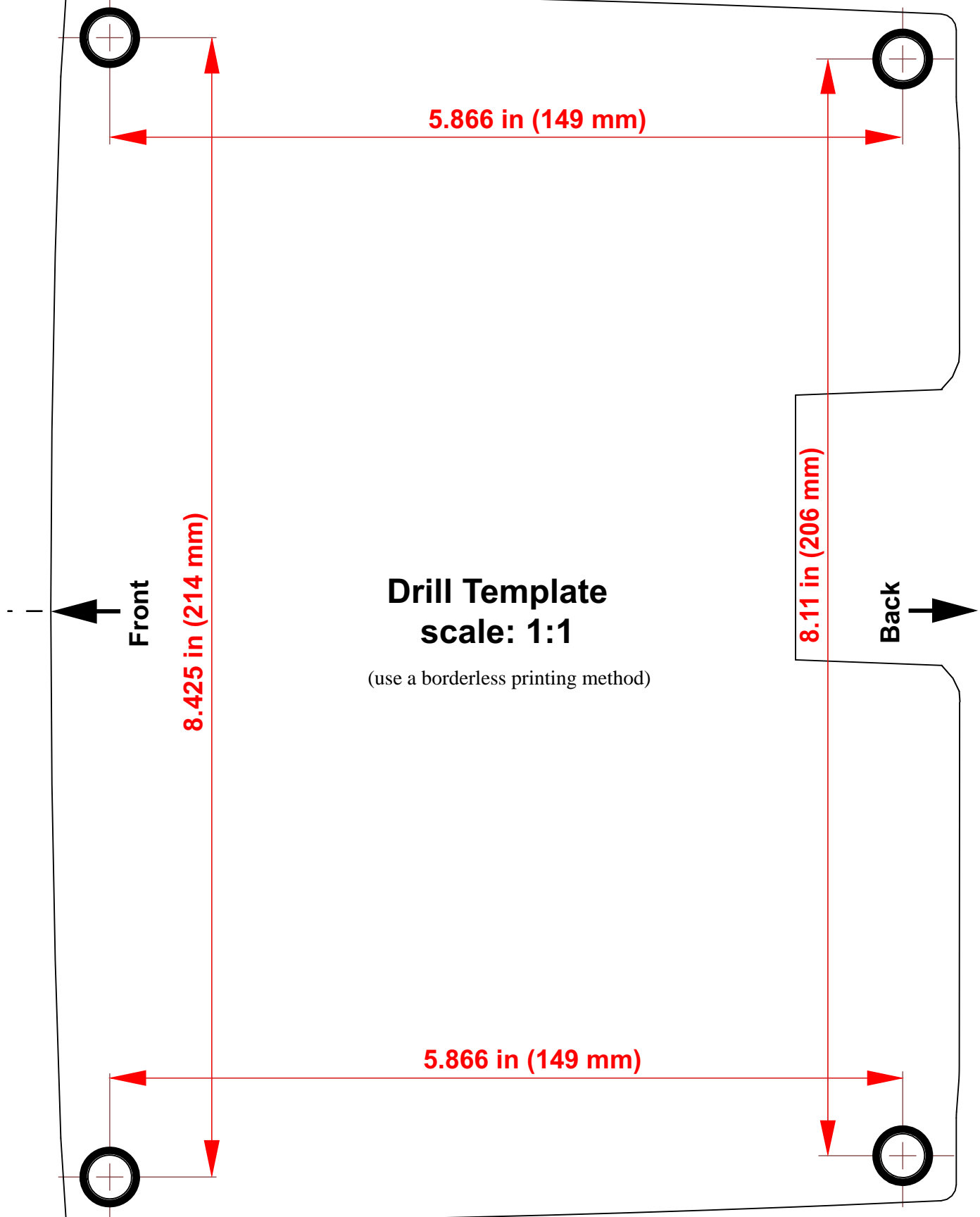
5.866 in (149 mm)

8.425 in (214 mm)

8.11 in (206 mm)

Front

Back

Drill Template
scale: 1:1

(use a borderless printing method)

5.866 in (149 mm)

3

How to use the Authenticator CF

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

Applications and software levels

The D SCAN AUTHENTICATOR CF 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 a SDK license.

The D SCAN Essentials runtime software is provided for every document reader and is necessary for accessing D SCAN AUTHENTICATOR devices on a fundamental functional level 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 in the document. Using the D SCAN Extensions software, these features are always checked, and images in all available illuminations are always captured depending on the installed hardware options.

The default document recognition and checking software works with ICAO 9303 compliant documents of ID1, ID2, and ID3 format. A machine readable zone (MRZ) exactly as specified in Doc 9303, especially considering the OCR-B font, is required.

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 contact area of the D SCAN AUTHENTICATOR CF 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.

Align the documents

An instruction label on the cover provides schematic information for the user to place a document.

Figure 3.2 Instruction label on the cover

The procedure requires usually four steps:

1 Find the data page.

2 Rotate this page in such a manner that it faces down and the MRZ (**M**) is pointing left.

3 Put the page face down on the document contact area.

4 Move the document along the left part of the positioning angle until it stops.
- The accurate final position must be along the left (**L**) and the back (**B**) part of the document positioning angle.
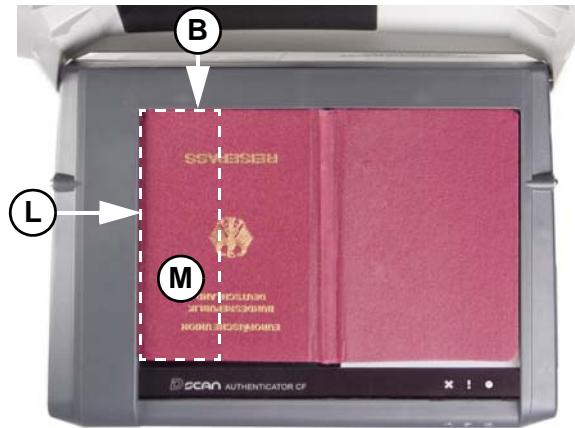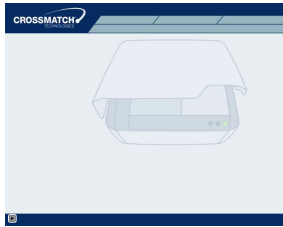

Figure 3.3 Positioning of a passport

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 in different methods. However the operation of the D SCAN AUTHENTICATOR CF will always be the same.

Note Before a document is processed ensure that the document contact 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 put on a document.

The D SCAN AUTHENTICATOR CF is very easy to use and to handle:

1 Power on the D SCAN AUTHENTICATOR CF.

2 Ensure that the ambient light cover is in the operating position.

3 Switch on your computer.

4 Start the D SCAN Show Case application. The software initializes the D SCAN AUTHENTICATOR CF and switches it to the operation mode.
- Depending on the performance of your computer, starting up can take a short moment.

Figure 3.4 Launching application

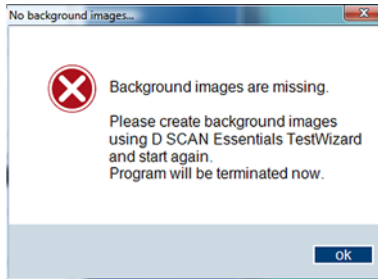- If no background correction images are stored on the connected computer a related message appears.

Figure 3.5 Message about missing background images

Note Before you restart you must capture the missing background images. See the Technical Reference Manual for detailed information.

- After successfully initialization the *Overview* window appears. The green status light (**1**) is on and indicates the operation mode.

The Overview page

The **Overview** page is the default page to show the data of 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 contact area so that the MRZ is pointing left.

Warning Do not look directly into the lights of the document contact 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 processing light (**3**) is yellow. The yellow processing light indicates that the data were recorded and are being processed.

Figure 3.6 Processing information

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

- When the document reader has completed processing the document, the processing light turns off, the green operation light comes on and a short acoustic signal occurs.
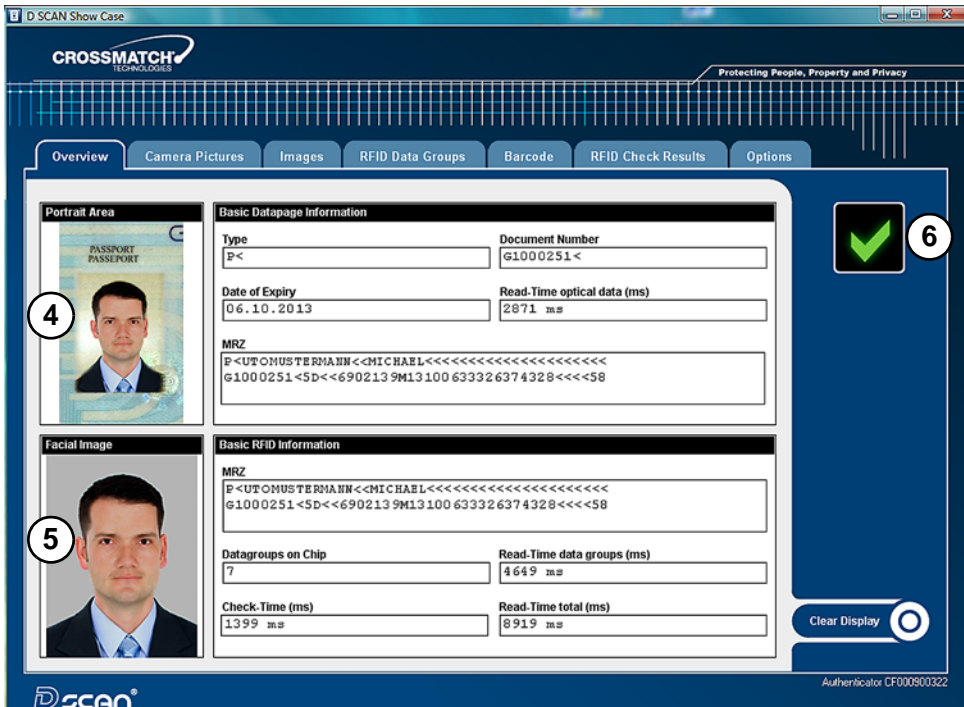- Now you can remove the document.

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, which are printed on the document.
- The lower part (**5**) shows the chip data, which are 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 3-13** for more information.

In the event of errors, failed verifications, or if the processed document is not recognized, the **failed** icon (**7**) appears.
- The **Clear Display** (**8**) button allows the operator to clear the displayed data.
- Repeat the operation with the same document to ensure that the problem was not caused by mispositioning the document. Correct the position by lifting-up and then repositioning the document.

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 left 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 click the left mouse button.
2 Keep the left mouse button pressed and 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 an 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.
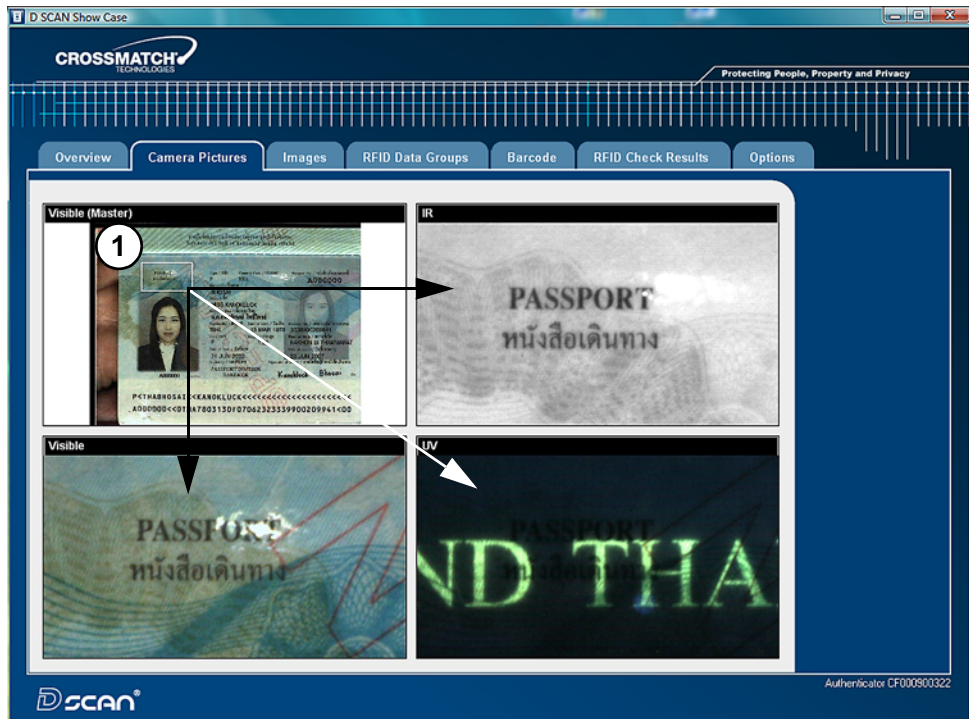
Figure 3.9   Camera pictures page

The images page

The **Images** page provides the ability to show 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 Place the mouse cursor into a displayed image and use the mouse wheel to zoom in or out an image. Press the right mouse button to switch off the zoom function.

4 The button **Save** (**3**) allows you to store the chosen image on your local disk.
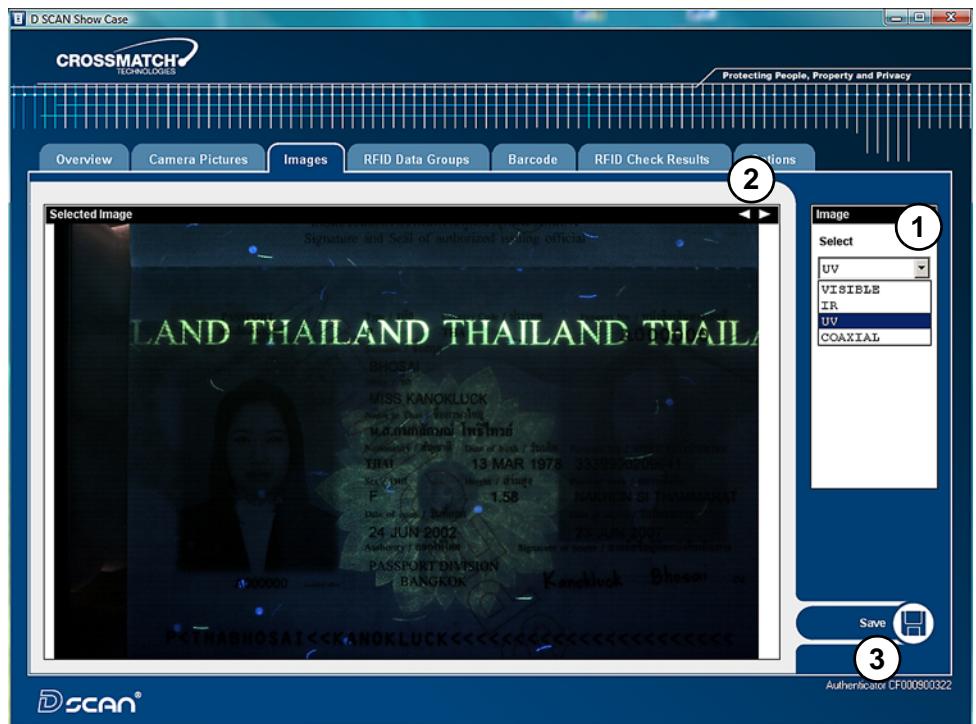
Figure 3.10 Images page

The RFID data groups page

The *RFID Data groups* page provides the ability to show 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 chose
the desired type of data group from the list (**1**).
   • If no RFID data 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 will be displayed on the right
sight (**3**) below the *Select* box.
3 The button **Save** (**4**) allows you to store the content of the chosen data group on
your local disk.
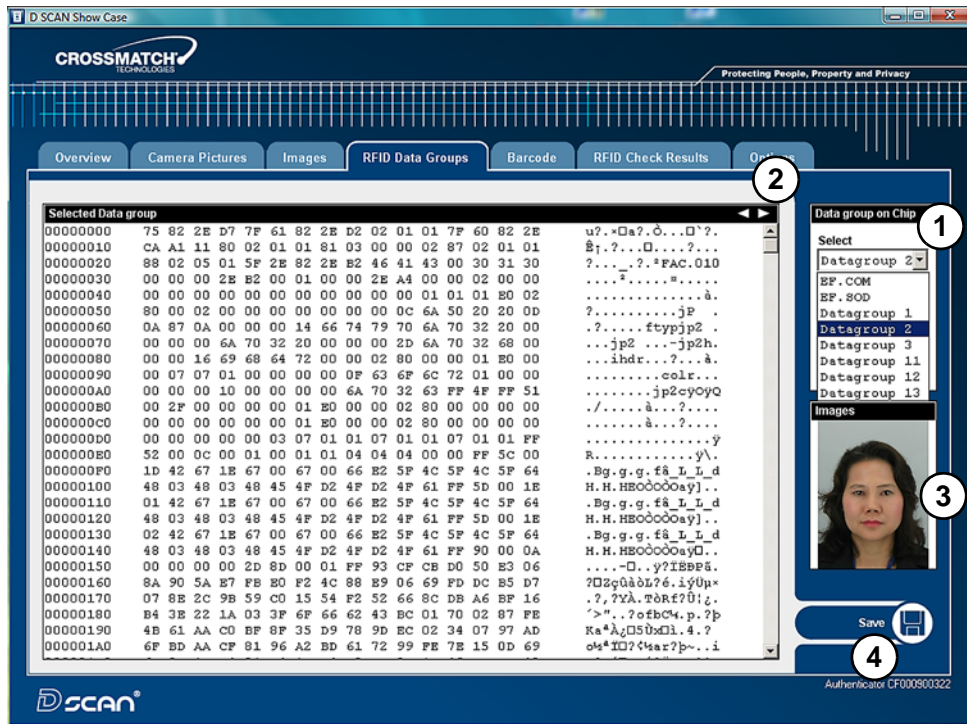
Figure 3.11 RFID data groups page

The barcode page

The **Barcode** page provides the ability to show every barcode found on the document. As the default setting the PDF417 barcode will be read. To read additionally barcodes you must enable these functions in the *Barcodes to read* box on the **Options** page.

1 To select a single barcode click the **down arrow** in the *Select* box and chose the desired barcode from the list (**1**).

2 If no barcode data available the *Select* box is grayed out.

3 To view all barcodes found click on the **left** or **right arrow** (**2**) in the right upper corner and scroll through all available barcodes.

4 The button **Save** (**2**) allows you to store the content of the selected barcode on your local disk.
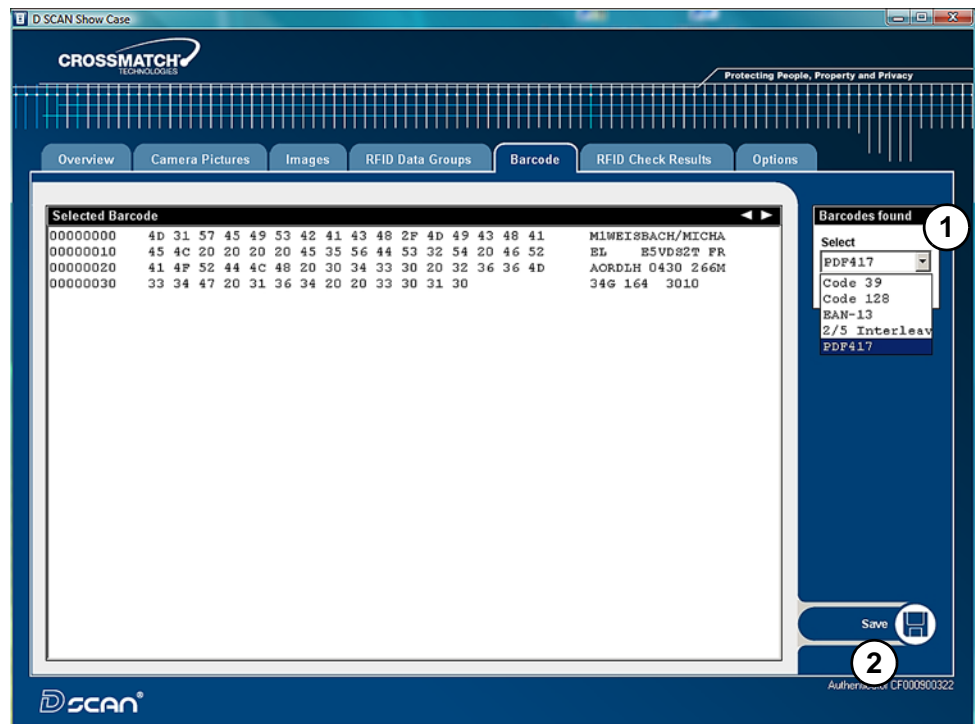
Figure 3.12 Barcode page

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 of failed security checks.

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

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

2 The button **Save** (**2**) allows you to store the list on your local disk.

Figure 3.13 RFID check results page

The D SCAN AUTHENTICATOR CF is ready to process the next document.

The options page

The **Options** page allows to change the default settings of the program and to configure the appearance of functions.
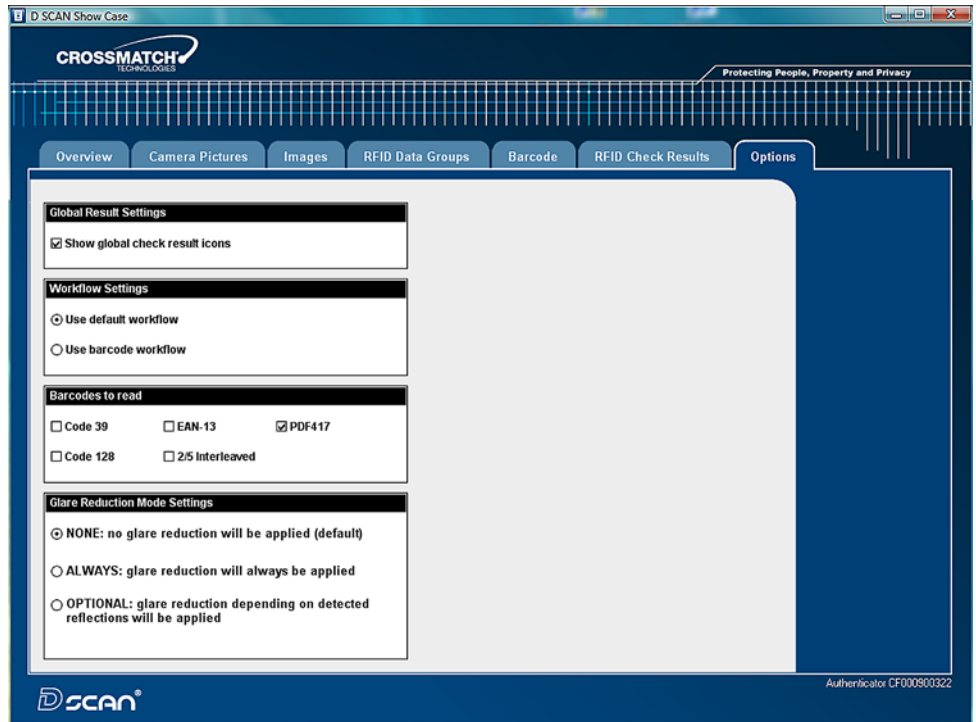
Figure 3.14 Options page

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(s). • 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 RFID data are read successfully. • No explicit error occurred during RFID verification. • Any other case occurred not listed above.

Workflow settings

In the default workflow, 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 to read additional barcodes.

Glare reduction mode settings

The glare reduction feature is not supported by all AUTHENTICATOR devices. Therefore glare reduction is deactivated as the default setting. Before you change this setting make sure that you install D SCAN Essentials 1.3 or higher.

4

Maintenance

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

Cleaning

This section describes how to clean the document contact area and the case. A clean document contact area is required for proper operation. Dirt can reduce the image quality of the processed document. Clean the platen with normal glass cleaner and make sure that no dirt, fluids or skin oils remain.

Warning Do not pour liquids (water etc.) onto the document reader. The device is protected against cleaning with a damp cloth or tissue. The device is not waterproof.

Caution Do not use oil-based cleaners or abrasive cleaners.

Clean the document contact area

1 Open the ambient light cover of the document reader.

2 Spray the glass cleaner onto the document contact area.

Figure 4.1   Clean the document contact area

3 With a lint-free cloth or tissue, wipe off the document contact area until clean and dry.

4 Make sure that the document contact area is dry before starting the reading process.

Clean the case

Warning Before you clean the case, disconnect the D SCAN AUTHENTICATOR CF from the grounded outlet.

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

1 Take a soft, lint free cloth and put a small amount of glass cleaner on it.

2 Wipe the case in a direction AWAY from the document contact area.

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.

Authenticator CF specifications

Table 4.2 Product specifications

Item	Specification
Resolution	Native 475 ppi sensor for best recognition of high density features
Dynamic range	Visible light and UV light 24 bit RGB color, IR light: 8 bit gray scale
Illumination	Visible light: wavelength 430-680 nm IR light: wavelength 895 nm UV light: wavelength 365 nm Coaxial light (not available in all markets)
Document support field size	5.9 in x 7.4 in (151 mm x 189 mm), document thickness is not limited
Optical scan format	Active size 5.3 in x 3.9 in (135 mm x 100 mm)
Optical scanning time	approx. 2 seconds for all images combined
Image format	2528 x 1888 pixels
Supported documents	Compliant with ICAO 9303 documents of ID1, ID2, and ID3 format, other ID-1, ID-2 and ID-3 documents on request
Document thickness	Not limited
RFID operating frequency	13,56 MHz
RFID magnetic field strength	Max. 4,0 A/m
Transmission power	Max 200 mW
RFID tag access	According to ISO 14443 Type-A and Type-B plus applicable ICAO recommendations in ICAO Doc 9303 including supplement, LDS 1.7, PKI 1.1

Table 4.2 Product specifications

Item	Specification
RFID speed	All standardized rates, up to 848 Kbps, read-out times depend on RFID tag, operating system, and amount of data stored in the chip
Smart card reader	Contact SmartCard reader with landing contacts and able to read cards according to ISO 7816 protocol Type T=0 (asynchronous half duplex character transmission protocol) and T=1 (asynchronous half duplex block transmission protocol).
Environmental conditions	Indoor use, climate classification according to DIN EN 60 721-3-3
Temperature range	41 °F to 113 °F (+5 °C to +45 °C)
Humidity range	10 - 90% relative humidity, non condensing, no direct sunlight exposure
Dimensions (W x D x H)	10.36 in x 8.35 in x 5.89 in (263 mm x 212 mm x 150 mm)
Weight	5.1 lbs (2,3 kg), excluding cables and power pack
Interface	USB 2.0 High Speed, shielded cable
Power supply	Rated input: 18 - 24 V DC / min. 1 A / max. 7 A, Current used: Desktop power pack 19 V DC / < 30W, wide-range, input AC 100-240 V, 50/60 Hz
Regulatory	FCC, CE

Magnetic field strength

The following diagrams show the distances (mm) to maintain in relation to the magnetic field strength (A/m) for the AUTHENTICATOR CF document reader.
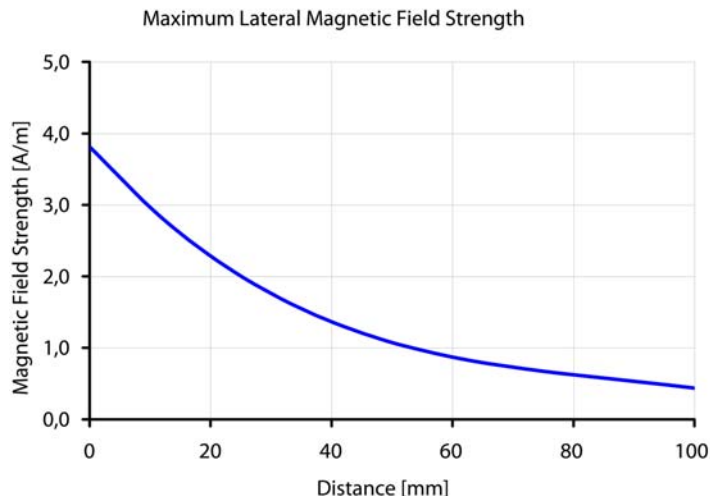
Figure 4.3 Magnetic field strength lateral

Maximum Frontal Magnetic Field Strength
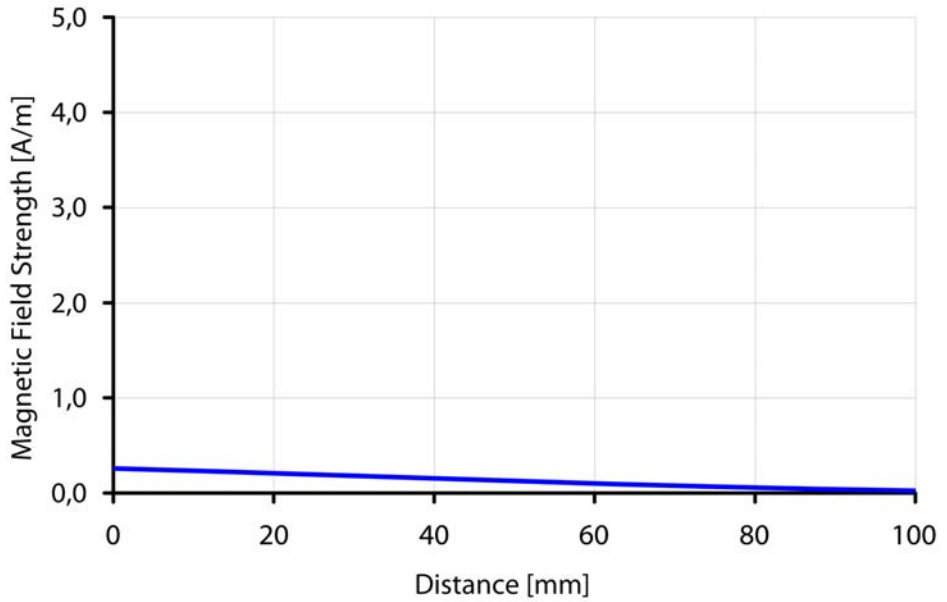
Figure 4.4   Magnetic field strength frontal
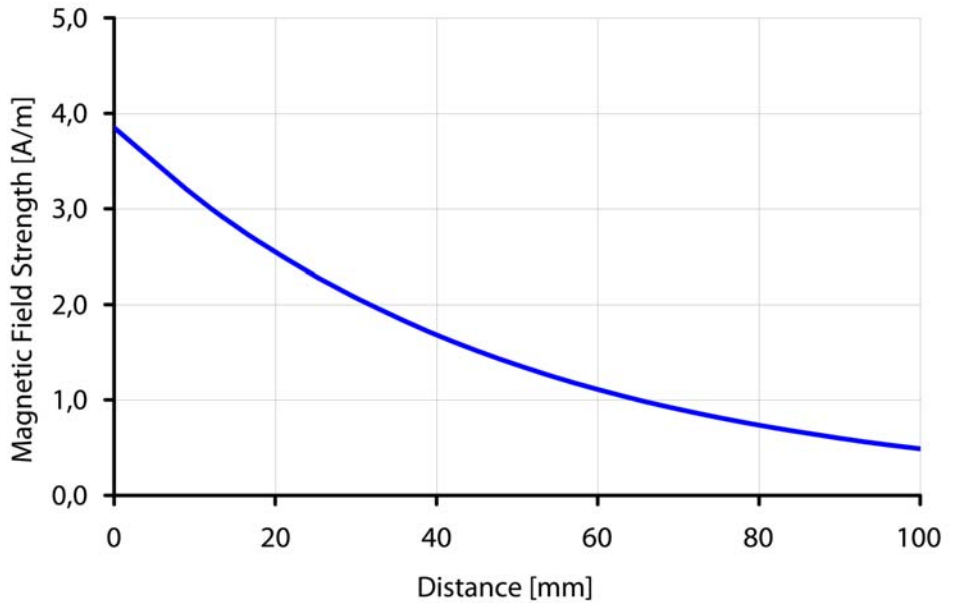
Maximum On Top Magnetic Field Strength

Figure 4.5   Magnetic field strength on top

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 USB cable is firmly connected to the computer or hub.

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 processing light is flashing.

First actions to correct the problem
1 Confirm the message Connection broken by clicking OK.
2 Re-establish the USB connection.
3 Re-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 processing light is on.

First actions to correct the problem
1 Verify USB cable is firmly connected to the computer or hub.
2 Open the Windows Task Manager and close the DS_HAL Server.exe or the DS_HAL ServerU.exe.
3 Initialize the Authenticator again.

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 processing surface.
2 Ensure that you have no direct light exposure shining onto 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 2-6**.
2 Verify that you do not use a USB 1.1 interface port.

More actions to correct the problem

Contact the Technical Support department.

Creating a problem report

If the steps mentioned before were unsuccessful, 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 CF.

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 Technical Support department addresses

North America and South America	Europe, Africa, Asia and Australia
CustomerCare@crossmatch.com	Support-jena@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 Technical Support department numbers

North America and South America	Europe, Africa, Asia and Australia
Monday- Friday 8 am to 5:30 pm EST	Monday- Friday 8 am to 4 pm CET
Customer Care Tel: **1.866.276.7761** (**Toll Free**) Tel: 1.561.622.9210 (International) Fax: **1.561.622.8769**	Customer Service Tel: **+49 (0)3641 4297-852** Fax: **+49 (0)3641 4297-757**

Free technical support is available by telephone or facsimile for the D SCAN AUTHENTICATOR CF 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 CF serial number (found on the back 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, the test images and the background images
- The used D SCAN software and version number

Return and repair of the Authenticator CF

You must have an RMA number to return a D SCAN AUTHENTICATOR CF 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

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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CROSSMATCH®
TECHNOLOGIES

Part Number: 96100004791002 v2.1