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Thales Gemalto Document Reader CR2000 User Guide

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Office Locations

The Americas

14 Colonnade Road c/o
20 Colonnade Road
Ottawa, ON
Canada K2E 7M6

Telephone: +1-866-500-2347
technical.service@thalesgroup.com

Asia, Pacific and Australia

12 Ayer Rajah Crescent
139941 Singapore
Singapore

Telephone: +65 6317 3333

Europe, Middle East and Africa

6 rue de la Verrerie
CS 20001
92197 Meudon
France

Telephone: +33 1 55 01 50 00

> Thalesgroup.com <

Preface

This user guide describes the features and functions of the Thales Gemalto Document Reader CR2000 (model number CR21-xx-xx-xx-xx).

Revision History

Version	Date	Description
01	February 2023	Draft in progress

Electromagnetic Compatibility (EMC)

The Products are designed to be immune to levels of interference generated within an office environment and not to interfere with other equipment. In order to provide this level of compatibility the Product, its cabling and Power Supply Unit (PSU) or its installations, must not be modified in any way.

⚠ CAUTION   Modifications or changes to the Product, the interface cables or the power supply not expressly approved by the manufacturer could void the User's authority to operate the Product and/or break local laws or regulations.

NOTICE   In some situations AC line transients or Electrostatic Discharge may cause a loss of communication between the document reader and the host application. If this occurs, it may be necessary to restart the host application, or unplug and reconnect the USB cable, or power cycle the document reader in order to restore operation.

For further regulatory information or copies of certificates contact your local Thales representative or direct your questions to technical.service@thalesgroup.com

EMC Compliance Europe

The Product meets the following European Council Directives:

C E

- Scanner: EMC (2014/30/EU), RFID option: Radio Equipment (RED) (2014/53/EC)
- Restriction of the use of certain hazardous substances (RoHS2) Directive 2011/65/EU

FCC/ISED radio frequency rules and regulations

ISED non-interference disclaimer

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with the Canadian ICES-003 Class A specifications. CAN ICES-003(A) / NMB-003 (A).

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempt de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;
(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ISED RF Exposure statement

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the radiator and any part of your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiations ISED CNR-102 établies pour un environnement non contrôlé. Une distance de séparation d'au moins 20 cm doivent être maintenue entre l'antenne de cet appareil et toutes les personnes. Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.

IC: 22832-PR01767

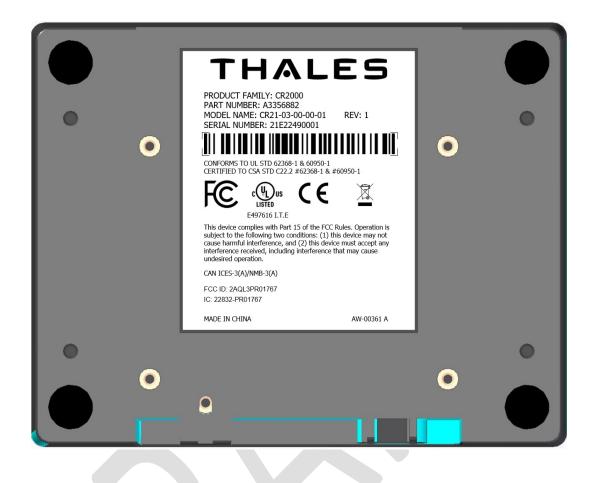### FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

FCC ID: 2AQL3PR01767

THALES

PRODUCT FAMILY: CR2000
PART NUMBER: A3356882
MODEL NAME: CR21-03-00-00-01   REV: 1
SERIAL NUMBER: 21E22490001

CONFORMS TO UL STD 62368-1 & 60950-1
CERTIFIED TO CSA STD C22.2 #62368-1 & #60950-1

FC c(UL)us LISTED CE 🖭

E497616 I.T.E

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.

CAN ICES-3(A)/NMB-3(A)

FCC ID: 2AQL3PR01767
IC: 22832-PR01767

MADE IN CHINA   AW-00361 A

Disposal - European Directive 2002/96/EC

Do not dispose of this equipment in domestic or general waste. These devices can be recycled and should be disposed of in accordance with your local and national regulations.

Do not send equipment back to Thales unsolicited.

Packing for Transportation

When packing this product for repair or shipment, carefully disconnect the cables and power supply and pack in the original inner and outer packaging cartons.

Important Safety Information

This manual contains important information regarding the operation of the Thales Gemalto Document Reader CR2000. For the safe and reliable operation of the readers, all users must ensure that they are familiar with and fully understand all instructions contained herein.

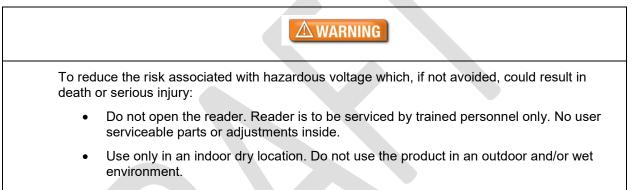|	
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in injury or equipment damage.
NOTICE	Indicates a situation which, if not avoided, could result in equipment damage.

Note: Provides additional important information.

Foreign language translations of these safety instructions can be found on our Customer Portal and in the SDK.

WARNING

To reduce the risk associated with hazardous voltage which, if not avoided, could result in death or serious injury:

- Do not open the reader. Reader is to be serviced by trained personnel only. No user serviceable parts or adjustments inside.

- Use only in an indoor dry location. Do not use the product in an outdoor and/or wet environment.

CAUTION

To reduce the risks associated with environmental contamination which, if not avoided, could result in minor or moderate injury:

- Dispose of electronic waste in accordance with all applicable regulations.

- Only an authorized, trained technician should perform change the glass. Failure to correctly follow the instructions could result in injury or cause damage to the equipment. Readers with broken glass should be sent to a repair centre for cleaning and safe disposal of the broken glass pieces.

Using different interface cables other than the ones provided or approved by the manufacturer:

- May result in unsafe use conditions and / or cause possible product damage and will void the product warranty.

- Could void the User's authority to operate the product and / or break local laws or regulations.

NOTICE
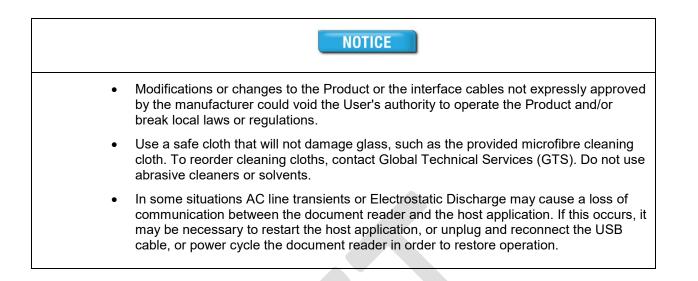
- Modifications or changes to the Product or the interface cables not expressly approved by the manufacturer could void the User's authority to operate the Product and/or break local laws or regulations.

- Use a safe cloth that will not damage glass, such as the provided microfibre cleaning cloth. To reorder cleaning cloths, contact Global Technical Services (GTS). Do not use abrasive cleaners or solvents.

- In some situations AC line transients or Electrostatic Discharge may cause a loss of communication between the document reader and the host application. If this occurs, it may be necessary to restart the host application, or unplug and reconnect the USB cable, or power cycle the document reader in order to restore operation.

Table of Contents

1. Introduction

The Thales Gemalto Document Reader CR2000 is an optical character recognition (OCR) and ID1 sized document capture device that provides automated data capture from a variety of personal identification documents. Lightning fast image capture comes from the USB 3.1 Super-Speed interface.

The Gemalto CR2000 has a Radio Frequency IDentification (RFID) interface for reading eDocuments in one action synchronously with the optical reading. The reader can automatically capture the machine readable zone (MRZ) data, images and chip data from a variety of personal identification documents, including ePassports, passports, visa, driving licenses and other travel documents as well as decoding barcodes from documents such as boarding passes.

The reader's small footprint makes it ideal for use by immigration control, airlines, banks, hotels, and casinos. The reader has no motorized moving parts to ensure maximum reliability.

Gemalto Document Reader CR2000

Key features

The Gemalto Document Reader CR2000 has the following features:

- Optical character recognition (OCR) of ICAO and similar documents

- Light sources for image capture – visible (RGB) at 400-700mm and Near IR B900: 880nm, +/-5%

- Captures full-colour or grey-scale images at high resolution (700 DPI camera) using True-Colour technology

- Supports single-handed operation. Scanner shape will ensure document does not fall and stays in the best capturing position,

- Simple, intuitive and quick operation that accepts documents in different orientations

- USB 3.1 interface using a Type-C connector. USB-powered, no external PSU required

- Automatic document detection

- Small footprint, no moving parts, robust construction

- Chemically Strengthened Glass for advanced durability and scratch resistance

- Thales Gemalto Document Reader SDK is a flexible software interface which allows host application to select which illumination sources to use, image type, image compression, and validation, photo extraction, etc. Environments include C++, C#, Java, VB.net, etc.

Common applications

Typical uses of the Gemalto Document Reader CR2000 include:

- Hotel check-in and reporting

- Document inspection and data capture at banks and casinos

- ID checks for visitor management and enrolment

- Age checking for regulated products

- APIS data capture with cross checking of FAA watch lists

- Travel document reading

- Scanning full-colour or grey-scale images of ID1 sized documents for storage

- Reading mDoc documents such as mDL electronic driver licenses

Supported documents and formats

The Gemalto CR2000 reads a wide-range of documents and formats:

- Supported documents include passports, visas, ID cards and all other ICAO-standard travel documents, as well as many non-ICAO variations

- Optional Integrated ePassport (RFID chip) reader so kiosk can read the Machine Readable Zone (MRZ) and smartcard chip in one operation.

    - Contactless IC reading for electronic documents (LDS 1.7 & 1.8) including basic access control (BAC), passive/active authentication (PA/AA), Chip Authentication (CA), Terminal Authentication (TA), extended access control (EAC v1/v2), supplementary access control (SAC) and PACE-CAM are supported. The SDK provides writing capability using APDUs

    - Contactless IC reading for eDL & iDL (electronic driving licenses) up to DG14 including basic access control (BAP v1), Password Authenticated Connection Establishment (PACE), passive/active authentication (PA/AA), Chip Authentication (CA), Terminal Authentication (TA), supplementary access control (SAC) and extended access control (EAC v1) are supported

- Reads 1D and 2D barcodes (PDF417, Aztec, QR® codes and Data Matrix™), SDK includes an AAMVA decoder

- Reads boarding passes (BCBP) and 1D/2D barcodes.

- Contact smartcard reading to ISO 7816 Class A and AB (T0/T1)

- Data capture from HRZ and non-ICAO documents (optional software package)

- Form filling and enterprise software interface software (optional software package)
- Enhanced document verification software (optional software package)

Reader components

The Gemalto Document Reader CR2000 is a small desktop device with:

- A window for scanning documents
- Device status and activity lights
- Single USB 3.1 Type-C port for communication and power

Document window

The document window is a glass surface located on top of the reader. Place documents on the window to scan them. The reader will automatically detect when a document is placed on it.

Keep this surface clean to ensure optimum operation of the reader.

Indicator lights

The indicator lights show the reader status and scan results.

Light	Colour	Description
Error	Red	Document is of an unknown type or did not process properly.
OK	Green	A known document type was presented and processing was successful.
Busy	Yellow	Reader is scanning a document and processing the data.
Ready	Blue	Reader is ready to scan a document (when connected to the host application).
	Flashing Blue	Reader is not connected to a running application

Back panel

The back panel contains a USB port for both data communication and power.

2.   Installing the Reader

This chapter explains how to install the Thales Gemalto Document Reader CR2000 software and connect the reader to the PC.

Before you begin

Before you install the reader, you need to meet the following requirements:

- A PC with an USB 2.0 or 3.1 port (the reader will not work if connected to a USB 1.1 port)

- A PC running 32 or 64 bit versions of Windows® 7, Windows® 8.1 or Windows® 10, Linux® LTS builds for Ubuntu and CentOS. Additionally macOS is supported (contact Thales for more details).

- Administrative rights to install the software

Unpack the reader

Each reader package consists of:

- Gemalto Document Reader CR2000

- USB communication cable

To unpack the reader:

1. Remove the contents from the box and separate the components from the packing material.
2. Verify that all the parts described have been received. If any parts are missing, contact Global Technical Services (GTS).
3. Keep and store the original packaging in the event that the reader requires shipment back to Thales for maintenance.

Note: If the reader has been stored in a cold environment (i.e. below room temperature), allow the reader warm up for a minimum two hours before powering it on.

DO NOT connect the reader to the computer until you have installed the software.

Install the software

The reader package contains an instruction sheet with links to a customer portal to download the software components and documentation necessary to install and operate the reader:

- Gemalto Document Reader SDK

- Reader and software documentation

- Required drivers

- Additional SDKs based on the reader model

To install the reader software:

1. Download the latest SDK software from the link. Click on the *Gemalto Document Reader SDK x.x.x Setup.msi* link and save the exe file to a known location on the PC (for example, the desktop).

2. Run the downloaded .msi file and follow the on-screen instructions.

Connect the reader cables

Note: Make sure you install the software before connecting the reader.

To install the reader, you need to connect the following cables:

- USB cable – The reader is supplied with a USB 3.1 (USB-C™ to Type A). The cable provides both power and data connectivity to the reader.

- If you have a computer with a USB-C connector and a reader with a USB-C you can buy a USB-C to USB-C cable to connect the reader.

Note: Use on the USB cable provided with the reader.

⚠ **CAUTION** Modifications or changes to the Product or the interface cables not expressly approved by the manufacturer could void the User's authority to operate the Product and/or break local laws or regulations.

Connect the USB cable:

I. Insert the USB-C connector into the USB port located on the underside of the reader under the cover.

II. Insert the Type A connector into a USB port on the host PC.

Power on the reader

The reader powers on immediately after being attached to a powered PC.

A power-on self-test occurs automatically when the reader powers up. If the reader is installed correctly and is operational, the indicator lights perform the following sequence:

- All lights come on briefly at initial power-up.

- After several seconds, the Ready light (blue) remains on (all other lights turn off)

The lights may also indicate the following common communication errors:

- The Ready and Error lights flash rapidly if a USB 1.1 connection is detected. **The reader will not transfer document images over a USB 1.1 connection.**
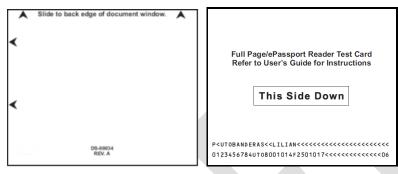
Test the reader installation

After installing the reader, perform a quick test to ensure the reader is functioning properly and the software was installed correctly.

Note: This procedure describes how to use the Gemalto Document Reader software when testing your reader installation. If your reader shipped with different software, following the procedures included with that software.

To test the reader:

1. Start the application **Page Reader Expo** from the shortcut created during software installation.

   Note: The reader initialization process may take up to 30 seconds.

2. From the Schemes dialog box select **Visible and IR Images**.

3. Click **Select**.

4. Verify that the Ready light (blue) is on and the test application indicates Ready to Scan.

   The reader is ready to accept documents.

5. Select the test card (DS-00034 or DS-00043) supplied with the reader.

6. Place the test card face down on the document window, aligned with the left guide, with the test card instructions facing up.

7. Push the card to the back of the document window until it stops.

   Note: Do not move the document during the scanning process.

8. Observe the lights during the scanning procedure.

   - The Ready light (blue) turns off and the Busy light (yellow) turns on.
   - The Busy light (yellow) remains on while the reader scans and processes the data.
   - The OK light (green) turns on, indicating a successful read.
   - The Ready light (blue) turns on, indicating that the reader is ready to scan another document.

   The data from the test card is sent to the host computer and the results displayed on the PC screen.
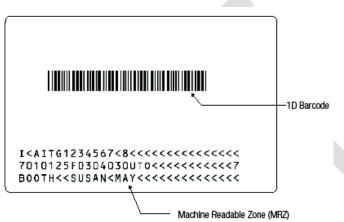
   If the test is successfully, the visible image is displayed.

3. Reading Documents

The Thales Gemalto Document Reader CR2000 reads the barcode and machine-readable zone (MRZ) text on both identification cards and passports. When a document is properly aligned on the document window, the reader automatically captures an image and then performs optical character recognition (when there is OCR data), followed by barcode recognition.

Document layout

Identification cards typically have a photo and basic information on the front and a 3-line MRZ on the back.

1D Barcode

I<AITG1234567<8<<<<<<<<<<<<<<
7010125FD3D4D3OUTO<<<<<<<<<<7
BOOTH<<SUSAN<MAY<<<<<<<<<<<<<

Machine Readable Zone (MRZ)

Passports have a photo, vital information and a 2-line MRZ on the front.

Full Image Capture Area

Machine Readable Zone (MRZ)

To read a standard document

1. Slide the document on the glass until it reaches the stop at the bottom that holds the document in place.

2. During reading, the document must lie flat against the document window. The left edge of the document must be preferable aligned against the left of the scanning window.

3. When the document reaches its proper position, the reader will automatically start scanning the document.

4. Observe the indicator lights during the scanning procedure.

- The Ready light (blue) turns off and the yellow LED (BUSY) turns on.

- The Busy light (yellow) remains on while the reader scans and processes the data.

- The OK light (green) turns on, indicating a successful read.

- The Ready light (blue) turns on, indicating that the reader is ready to scan another document.

The data from the document is sent to the host computer.

Reading RFID documents

When equipped with the RFID option the reader will detect the presence of a contactless RFID chip and will read the contactless data. Reading RFID data takes place at the same time as optical imaging, so the document reading procedure is identical to the procedure described above but depending on the document may take typically 3 to 10 seconds, the LEDs turning green or red will show when the document can be removed.

4. Maintenance

The Thales Gemalto Document Reader CR2000 has no user-serviceable parts but its glass surface must be cleaned on a regular basis. For extensive repairs, return the reader to Thales service depot.

Cleaning the reader

Clean the reader regularly to ensure proper performance.

NOTICE Use a safe cloth that will not damage glass, such as the microfibre cleaning cloth. To order cleaning cloths, contact Global Technical Services (GTS). See "Contacting GTS" for more information.

Do not use abrasive cleaners or solvents. These may scratch the glass or damage the plastic.

To clean the reader

1. Unplug the reader from the PC.
2. Clean the document window with a clean cloth. For stubborn dirt, use a mild glass cleaner or a lightly dampened cloth (water).
3. Verify that there are no streaks or smudge spots remaining on the document window.
4. Clean the body of the reader with a lightly dampened cloth (water).
5. Reconnect the reader to the PC.
6. Verify that the power-up self test performs correctly.

To replace the document window glass

1. Disconnect the USB cable, ensuring no LEDs are lit on the reader.
2. Detach the document hood by removing the two retaining screws located on the back of the panel. The hood slides to the rear of the reader and then lifts off upwards using light pressure.
3. Gently lift the glass up and off the reader while being careful not to damage or remove the rubber gasket seal.

4. Clean the replacement glass and then drop into the cut out on top of the gasket. Ensure that the beveled edge on the glass is inserted toward the front of the reader.

   NOTE: It is important that the internal components be free from dust or other contamination. If any dust is present, use compressed air to remove it from the optical chamber.

5. Re-attach the document hood, ensuring that the clip is engaged first and then lower and slide the hood towards the front of the reader.

6. Reconnect the reader to the PC.

7. Verify that the power-up self test performs correctly.

5.   Specifications

Physical Specifications	Dimensions	Length: 86 mm (~3.35 inches) Width: 115 mm (~4.49 inches) Height: 86 mm (~3.35 inches)
	Weight	280g (1.7 lbs)
Electrical Specifications	Input voltage	5V (via USB port)
	Power consumption	Less than 900mA for USB 3.1 Type A host port Less than 3A for USB-C host port Less than 500mA for USB 2 host port
Environmental Specifications	Temperature	Operating: -10°C to 55°C (14°F to 131°F) Storage: –20°C to 55°C (–4°F to 131°F)
	Humidity	20% to 95% (non-condensing)
Communication Interfaces and Protocols	Interface	USB 3.1 with USB Type-C™ connector, SuperSpeed up to 5 Gbps Gen 1 Specification Revision 1.0
	Host USB power	Reader draws less than 2.5W from host USB connector
	USB connectors	One USB Type-C connector
	USB cable length	1.5m (~0.59inches) and optional 2.0m (79 inches)
Regulatory Information and Standards	Directives	2014/30/EU EMC Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE) Directive 2014/53/EU RE Directive 2011/65/EU Restriction of Hazardous Substances (RoHS2) Directive

6.   Troubleshooting

Use the following table to identify and correct common issues encountered when using the reader.

Symptom	Possible Causes	Recommended Actions
The LEDs do not come on during power up.	There is no power to the reader.	Verify the host PC power source. Verify that the USB cable is connected to the connector on the back panel. Verify the reader is connected to a USB 2.0 or 3.1 host port.
	The unit is damaged.	Follow the procedure outlined in "Returning the reader for maintenance".
The Ready and Error LEDs are continuously blinking.	The system has only USB 1.1 capability.	Install the reader on a PC that supports USB 2.0 or 3.1. The reader requires a PC that supports USB 2.0 or 3.1 in order to transfer document images.
The reader is not communicating with host PC system.	The cable is not properly connected or USB drivers are not properly installed.	Verify that the USB cable is connected to the host. Verify that the USB driver is installed. Verify that only one reader is connected to the host system and only one instance of the host application is running.
The Error LED illuminates when a document is scanned	The document is non-machine readable.	This is a normal condition when there is no machine readable data and only the image is captured from the document.
	The document is poorly printed or does not conform to specification.	The reader is designed to read documents that are poorly printed. However, some documents are of such poor quality that the reader will not be able to process the OCR data. Verify the document conforms to ICAO 9303 or OCR-B font requirements
	High ambient light.	Re-orient the reader so that bright light does not fall directly on the document window.
	The unit is not configured to read the document being scanned.	Verify the reader configuration with technical staff. Contact Global Technical Services (GTS) at Thales.
	The document is not orientated correctly on the scanning window.	For details on document placement, see "Reading standard documents".
The demo application is not working.	The application may already be running.	Verify that only one copy of the application is running.

	Software is installed incorrectly	Remove the existing application & re-install software. For more information see the Software Installation section.
	Another application is running	Verify that no other application that accesses the document reader is running.
	You do not have PC Administrative rights.	Consult with your IT support representative.
Reader becomes unresponsive		Close and restart the application. Disconnect USB from PC and then reconnect. Disconnect USB. Close application and then restart PC. Reconnect document reader to PC and then open application. Contact GTS if still unresponsive.

7. Customer Service

If you cannot solve the problem after following the instructions in the Troubleshooting section, contact Thales' Global Technical Services (GTS).

Before contacting GTS

Be prepared to provide the information required to properly diagnose the problem:

- A detailed description of the problem

- A detailed description of the actions taken to correct the problem

- The serial number of the reader (located on the reader's bottom panel)

Contacting GTS

Once you have the above information, contact Thales' Global Technical Services at

technical.service@thalesgroup.com

Office locations and phone numbers are on page 2 of this document.

Returning the reader for maintenance

In the event of a suspected problem with Thales equipment, please use the following procedure.

To return a reader for maintenance:

1. **Diagnose** – The system manager will determine that there is an actual fault with the equipment which cannot be corrected by following the procedures in this document or with local in-house knowledge

2. **Initiate Call** – The system manager should contact Thales GTS via telephone, or email. GTS will request a detailed description of the problem along with the serial number of the unit. **It is the customer's responsibility to include or have on hand all pertinent information.**

3. **Response/Call Back** – A GTS representative will discuss with the system manager to determine the problem. If the problem can be corrected locally by the system manager with the guidance of the GTS representative, no further action will be required.

4. **Return Authorization** – If the problem cannot be corrected via telephone assistance, the GTS representative will issue a Return Materials Authorization (RMA) number and form. The RMA number will be used to track the failed reader, along with verification of the location of the service depot to where it should be sent.

5. **Return** – The system manager will carefully disconnect the defective equipment. The reader should ideally be packaged in its original packing box. If not, a suitable box with sufficient packing material should be used to minimize damage during transit. Place a copy of the RMA form inside the box

   The RMA number should be prominently displayed on the shipping container in which the reader is being returned. This reference number will ensure prompt processing of the equipment once it arrives at Thales

   The CUSTOMER is responsible for insurance coverage on the reader in case of loss or damage during transit to Thales. The reader should be returned to the Thales designated service depot.

6. **Shipping Instructions** – Four copies of a commercial invoice, a packing slip, a pro forma invoice, or the following information, typed on letterhead, must be sent with the reader:

   - Description of equipment, including serial numbers

   - Quantity

   - Value and Country of Origin

   - Exporter (customer's company)

   - Consignee (Thales)

   Please affix the shipping documents and a copy of the RMA form to the outside of the container.

7. **Repair** – When the defective equipment is received at the service depot, the reader will be repaired, tested and returned to the address the CUSTOMER specifies on the RMA form