

ADAPTIVE RECOGNITION

PASSPORT READERS & ID SCANNERS

User's Manual

Full Page Reader



Full Page Reader User's Manual

v. 2.2.9.0 and above

Document version: 2021-09-20

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1. INTRODUCTION

ADAPTIVE RECOGNITION provides its Full Page Reader (FPR) application included in the Passport Reader (PR) software package. Full Page Reader application is able to fully exploit the ADAPTIVE RECOGNITION document reader devices' capabilities on user level.

It provides:

- images scanned by different illumination sources (white, infra, UV, coaxial, OVD)
- OCR mode to reach MRZ, VIZ data and read different barcode types
- optical and RFID authentications

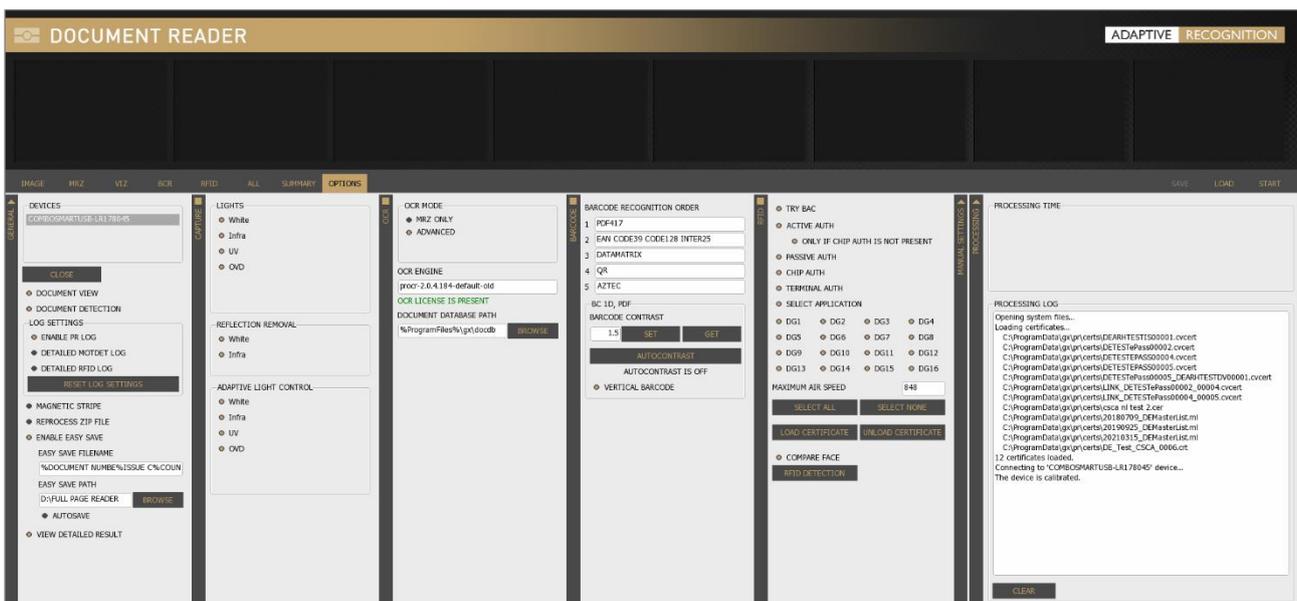
This guide is going to show you the functions of the app and the methods of the use.

First, the device overview and its accessing will be discussed.

Next, a closer look will be taken at the tabs of the application.

Then, the user will be guided through the settings of the Options tab menu.

Finally, a list of frequently asked questions is expounded.



3. REQUIREMENTS

- ADAPTIVE RECOGNITION ID/Passport Reader device(s) connected to the PC
- PC: minimum 2 GHz CPU and 1GB RAM
- OS: 32/64-bit Windows XP/Vista/7/8/8.1/10 or Linux (ask for more information)

4. START FULL PAGE READER APP

• Windows

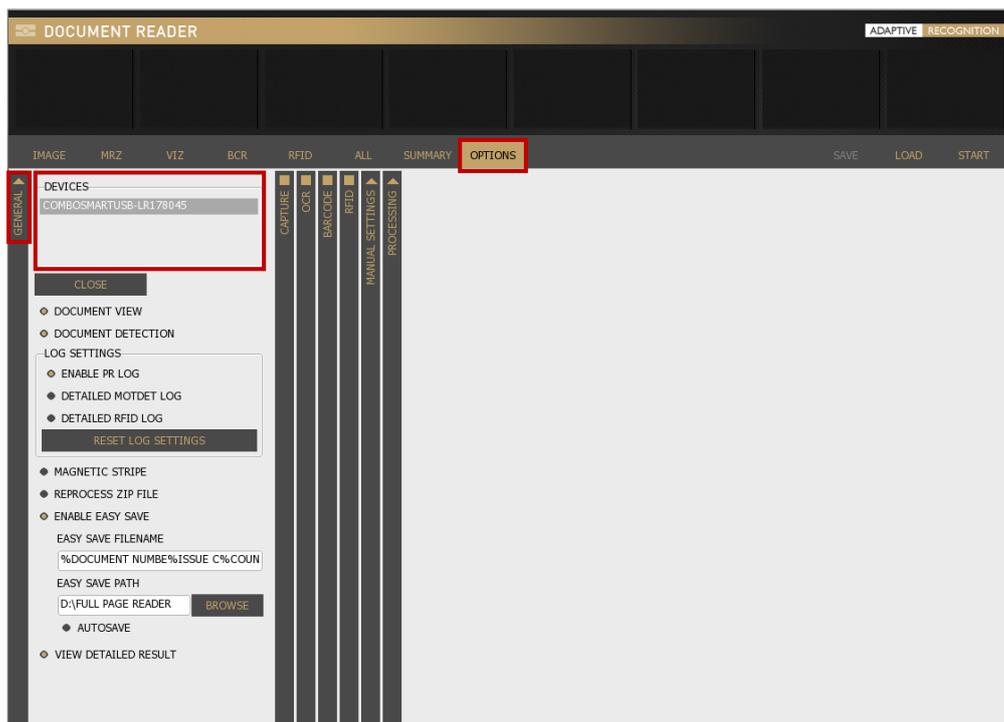
After installing ADAPTIVE RECOGNITION software package on your computer, you will be able to open Full Page Reader from **Windows Start menu > Adaptive Recognition > (Passport Reader) > Full Page Reader x86 or x64** (based on your computer architecture and previous installation).

• Linux

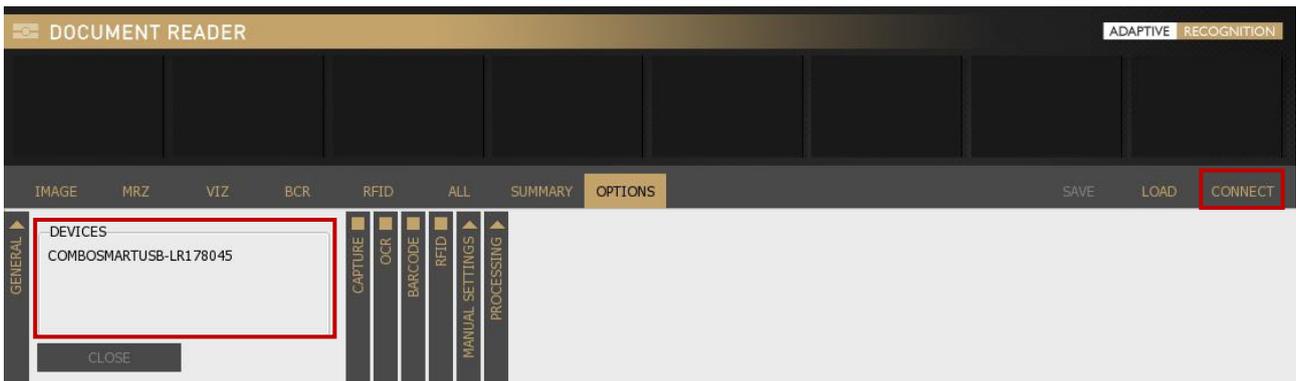
Depending on your distribution, you can open command terminal and insert: **FullPageReader** or use dashboard search bar: **Linux Start menu > Applications > Adaptive Recognition Apps > Full Page Reader 64-bit version** (based on your computer architecture and previous installation).

5. CONNECTION

In order to scan with any ADAPTIVE RECOGNITION reader device, you have to make sure that there is an available reader connected to your computer and it is turned on. You can check the **DEVICES** list in the **OPTIONS** tab at **GENERAL** layer.

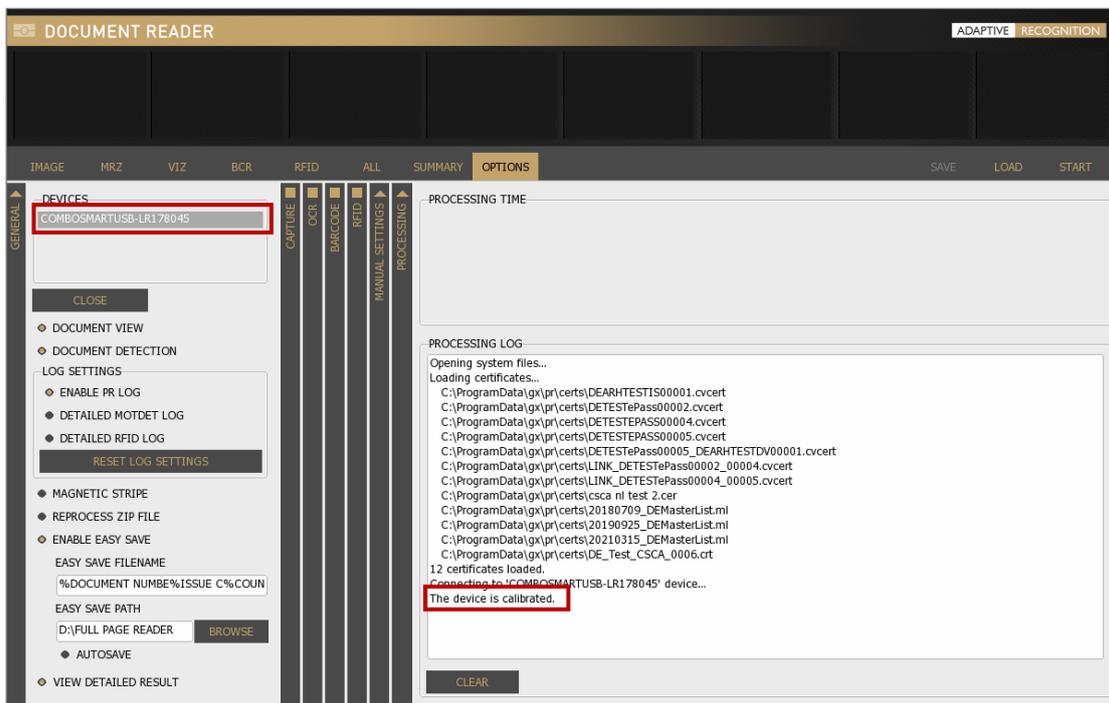


Connect your device by clicking on [CONNECT] or clicking on the selected reader in the DEVICES list.



Readers hold a factory default calibration file. Reading this file from the device for the first time may take some time, which consequently slows down the system startup. In order to save time, the file is automatically copied to the local file system on the first attempt of using the device to speed up communication. In this case "Reading calibration file..." message appears in the PROCESSING LOG field.

If your reader is displayed in the DEVICES list highlighted in grey and in the PROCESSING LOG field you get the "The device is calibrated." message, your reader is connected and ready to use.



Note

The Product Name contains the following information: the device name, configuration (components) and serial number (without 1st digit).

E.g., COMBOSMART-RSL184229

6. TABS



Enable/Disable any of the checkboxes on vertical layers (columns) in the **OPTIONS** tab. These checkboxes switch on/off software functions like image capturing, [OCR](#), barcode and [RFID](#) reading. By switching on functions, you will make visible the corresponding tab menu and related data as well.

Note

These columns can open and close like a vertical accordion menu.

Example

Enable RFID reading by filling in the checkbox on the vertical grey layer in the **OPTIONS** tab. This also enables the **RFID** tab to display RFID data after a successful reading process.

The screenshot shows the 'DOCUMENT READER' software interface. The top navigation bar includes tabs for IMAGE, MRZ, VIZ, BCR, RFID, MSR, ALL, SUMMARY, OPTIONS, SAVE, LOAD, and START. The 'OPTIONS' tab is active, and the 'RFID' checkbox is checked. The interface is divided into several sections:

- GENERAL:** Includes a list of devices (COMBOSMARTUSB-LR178045), a 'CLOSE' button, and various settings like 'DOCUMENT VIEW', 'DOCUMENT DETECTION', 'LOG SETTINGS', 'MAGNETIC STRIPE', 'REPROCESS ZIP FILE', 'ENABLE EASY SAVE', and 'VIEW DETAILED RESULT'.
- VERTICAL ACCORDION MENU:** Contains checkboxes for CAPTURE, OCR, BARCODE, and RFID. The 'RFID' checkbox is checked.
- PROCESSING TIME:** A section for displaying processing time.
- PROCESSING LOG:** A text area showing the following log entries:


```
Opening system files...
Loading certificates...
C:\ProgramData\gx\pr\certs\DEARHTESTIS00001.cvcert
C:\ProgramData\gx\pr\certs\DETESTePass00002.cvcert
C:\ProgramData\gx\pr\certs\DETESTEPASS00004.cvcert
C:\ProgramData\gx\pr\certs\DETESTEPASS00005.cvcert
C:\ProgramData\gx\pr\certs\DETESTePass00005_DEARHTESTDV00001.cvcert
C:\ProgramData\gx\pr\certs\LINK_DETESTePass00002_00004.cvcert
C:\ProgramData\gx\pr\certs\LINK_DETESTePass00004_00005.cvcert
C:\ProgramData\gx\pr\certs\cscs nl test 2.cer
C:\ProgramData\gx\pr\certs\20180709_DEMasterList.ml
C:\ProgramData\gx\pr\certs\20190925_DEMasterList.ml
C:\ProgramData\gx\pr\certs\20210315_DEMasterList.ml
C:\ProgramData\gx\pr\certs\DE_Test_CSCA_0006.crt
12 certificates loaded.
Connecting to 'COMBOSMARTUSB-LR178045' device...
The device is calibrated.
```
- CLEAR:** A button to clear the processing log.

6.1. IMAGE

6.1.1. Image

On the **IMAGE** layer, the scanned and/or selected images are displayed. Navigate among images by clicking on the thumbnail view on top or double clicking on the ones at details of the document field. Zoom in by left-clicking inside the image and dragging your mouse over the area you wish to enlarge.

Note

All images (even the ones at details of the document fields) can be zoomed out by double-clicking.

The screenshot displays the ADAPTIVE RECOGNITION DOCUMENT READER interface. At the top, there is a header with "DOCUMENT READER" and "ADAPTIVE RECOGNITION". Below the header, a row of thumbnails shows different processing options: White, Infra, UV, OVD, Clean OVD, Edge, and RFID. The main area shows the selected document, a Hungarian Identity Card, with a large "S" watermark. The card details are as follows:

Field	Value
Light	White
Format	BGR
Dimension	1694 X 1068
Resolution	500 DPI
Smooth Image	<input checked="" type="checkbox"/>
Rotate Left	<input type="button" value="ROTATE LEFT"/>
Rotate Right	<input type="button" value="ROTATE RIGHT"/>
Save Image	<input type="button" value="SAVE IMAGE"/>
Copy Image	<input type="button" value="COPY IMAGE"/>
View Layers	<input type="button" value="VIEW LAYERS"/>
View Frames	<input type="button" value="VIEW FRAMES"/>
View Latent Image	<input type="button" value="VIEW LATENT IMAGE"/>
Read Field	<input type="button" value="READ FIELD"/>

The card details include: Családi és utónev/ Family name and Given name: MÉSZÁROS BRIGITTA ERZSÉBET; Nem/Sex: NŐ/F; Születési idő/Date of birth: 15 08 1979; Ervényességi idő/Date of expiry: 04 01 2022; Okmányazonosító/Doc. No.: 000312AE; CAN: 012345; Aláírás/Signature: Mészáros Brigitta Erzsébet.

6.1.2. Details

INFO

Light or field ID, format, dimension and resolution information about the selected image are displayed.

SMOOTH IMAGE

Use linear filtering for zooming by estimating intermediate points among end points automatically. This results a smooth image to display.

ROTATE LEFT/RIGHT

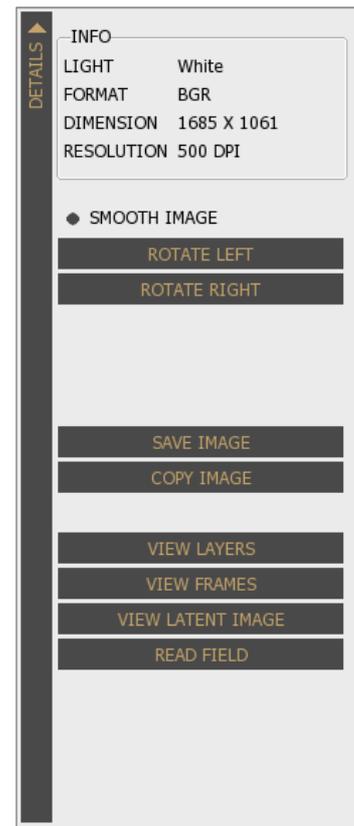
Rotate the image by pressing **[ROTATE LEFT]** or **[ROTATE RIGTH]** button. You can rotate the image by 90 degrees in one direction with one click.

SAVE IMAGE

Save the scanned image to your system by clicking on the **[SAVE IMAGE]** button.

COPY IMAGE

Copy the selected image to clipboard by clicking on the **[COPY IMAGE]** button.



Note

The **COPY IMAGE** function is available only for Windows OS.

VIEW LAYERS

By selecting between UV (VIEW UV FLASHLIGHT) and [OVD](#) flashlight (VIEW OVD FLASHLIGHT) on the right, you can check the document under these two illumination types separately. If you do not choose from these flashlights, you can grab the corner/edge of a given layer (except for infra) to optically remove each and every layer from the image of the scanned ID document by left-click. Check slider view too by holding-right-click.

Note

After optically removing the UV or OVD layer, the order of the remaining optically removable layers is fix following a natural order.



VIEW FRAMES

This function displays a frame of the selected reading field. [MRZ](#), [VIZ](#), [BARCODE](#) and [ERROR FRAMES](#) can be displayed around the original location of the data. Select the frame you wish to display from the available options.



VIEW LATENT IMAGE

Important!

VIEW LATENT IMAGE function works well on high-resolution images (e.g., images scanned by the Osmond and the PRMc device).

It displays the JURA IPI security feature. IPI is encrypted information in the face photo part of the document (passport or ID) that can be made visible either by special lenses or ADAPTIVE RECOGNITION document reader devices.

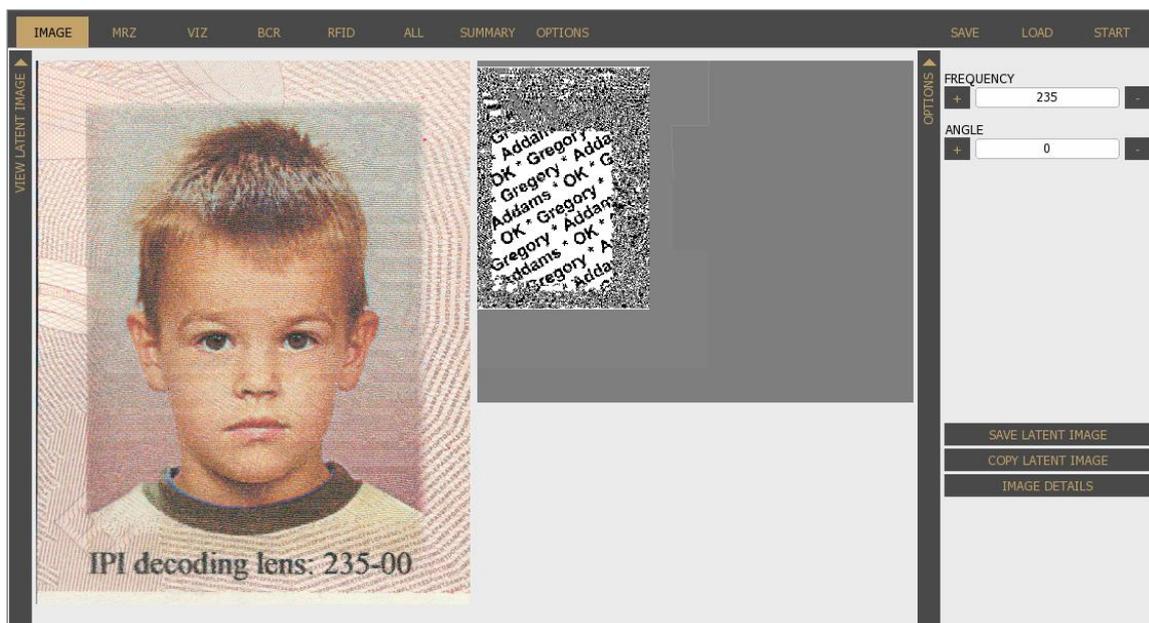
Note

To check the JURA IPI security feature, enable **Photo** camera on **CAPTURE** layer in the **OPTIONS** tab and click on the **Photo** image from the thumbnail images.

Note

You need to specify the **FREQUENCY** and **ANGLE** values to make this security feature visible. These values can vary by documents.

Specify these values by filling out the corresponding fields.



READ FIELD

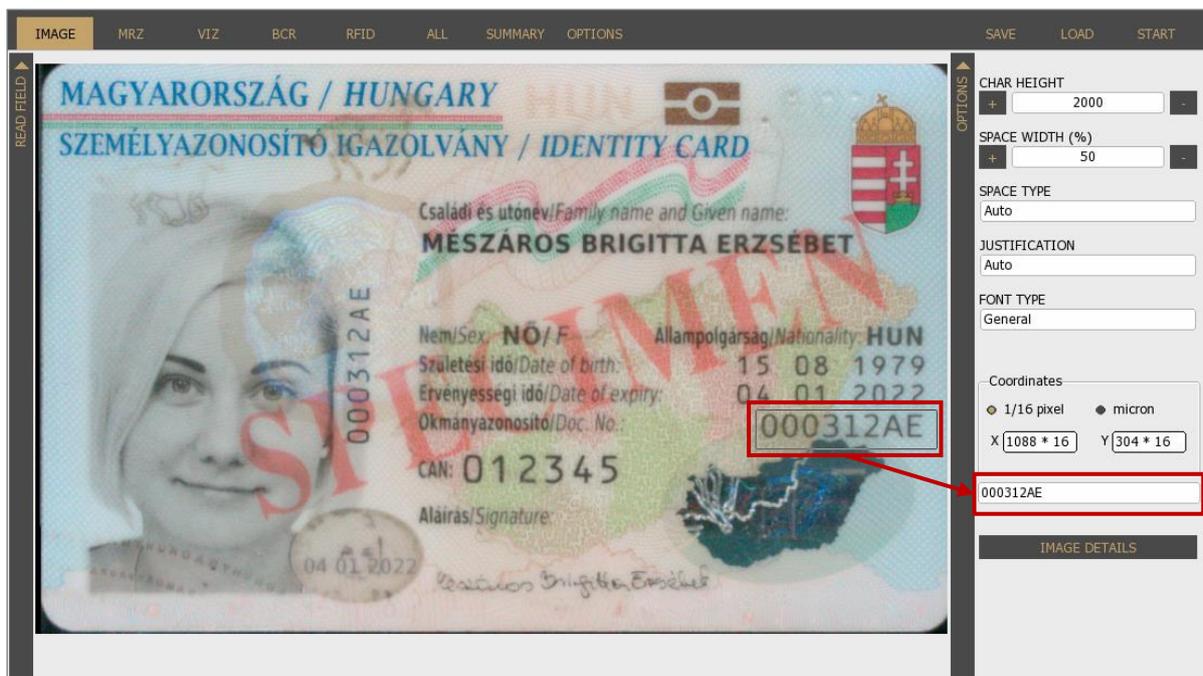
Note

This function is only available with engines 2.0.6.xx.

The **READ FIELD** function is equivalent to manual OCR. It can be used on **White** and **Infrared** image. Draw a rectangle around any text or barcode and its content will be displayed in the field at the bottom-right corner of the window. Adjust height/width properties to optimize recognition rate.

Note

It is suitable for trying out the manual OCR.
This function has limited ability (only recognizes a few fonts).



Note

In order to go back to the **DETAILS** layer, please click on the **IMAGE DETAILS** button.

6.3. VIZ

Displays processed VIZ data and a photo of each field.

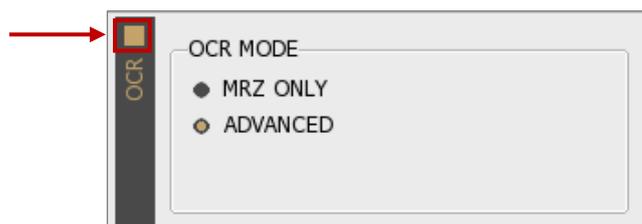
Note

The results of the authentication will be displayed in **VIZ** tab. The VIZ and AUTH results will be displayed only if you have special engine, that supports the scanned document.

IMAGE MRZ VIZ BCR RFID ALL SUMMARY OPTIONS SAVE LOAD START									
FIELDS									
ID	BAS	RAW	FMT	STD	OPT	DATA			STATUS
GIVENNAME	ROZALIA								No checksum
SURNAME	SPECIMEN								No checksum
MAIDEN NAME	SPECIMEN ROZALIA								No checksum
BIRTH DATE	22 FEB/FEB 78								No checksum
BIRTH PLACE	BUDAPEST07								No checksum
NATIONALITY	MAGYAR/HUNGARIAN								No checksum
SEX	N/F								No checksum
DOCUMENT NUMBER	BH0002014								No checksum
TYPE									No checksum
ISSUE COUNTRY	HUN								No checksum
ISSUE DATE	01 JAN/JAN 15								No checksum
EXPIRY DATE	01 JAN/JAN 20								No checksum
ISSUE ORG	KEKKH								No checksum
DOCUMENT TYPE	PP								No checksum
DOCUMENT PAGE	D								No checksum
DOCUMENT SUBTYPE	2012								No checksum
FACE									No checksum



To see this tab, fill in OCR checkbox on **OPTIONS / OCR** layer and select **ADVANCED** filter therefore MRZ and VIZ tabs are enabled.

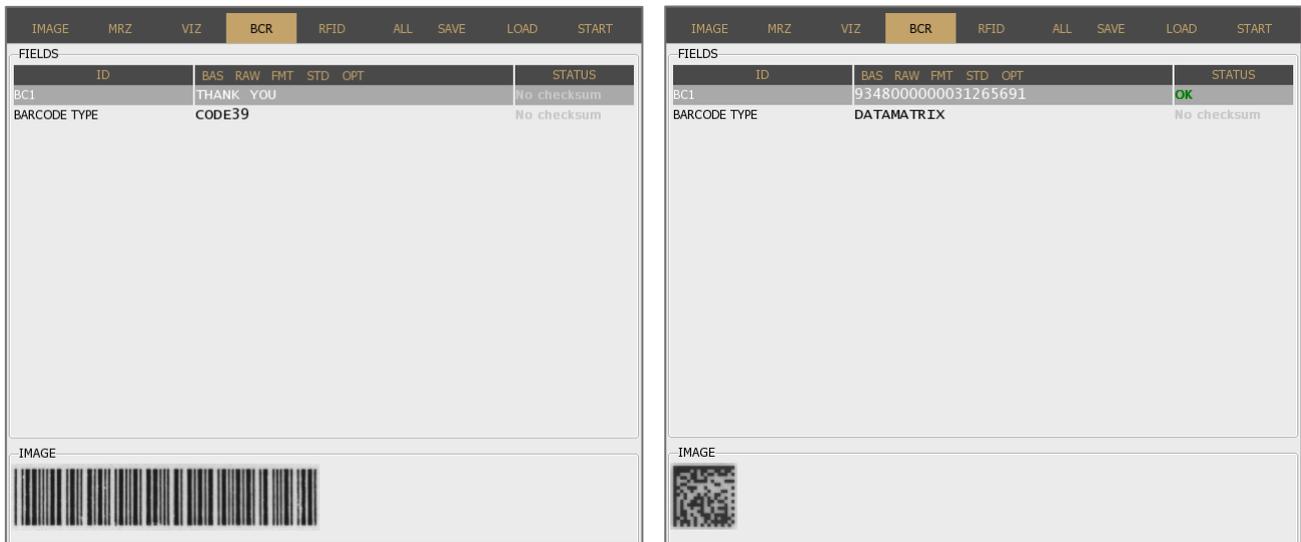


Select [VIEW DETAILED RESULT](#) filter to review formatted data. Choose format in the header of the **DATA** column.

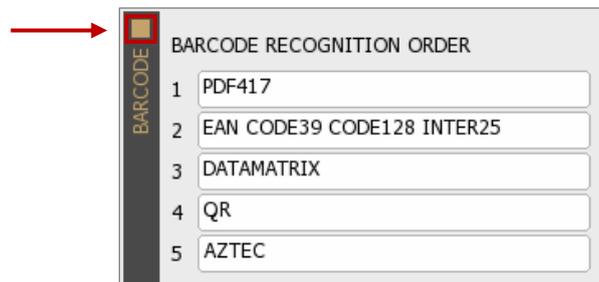


6.4. BCR

BCR displays barcode data and a photo of the barcode itself.

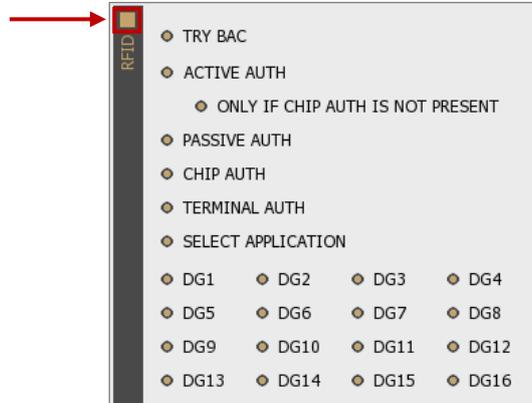


To see this option, enable barcode recognition on **OPTIONS / BARCODE** layer by filling in the checkbox on the vertical layer.



6.5. RFID

Displays RFID chip data. To see this option, enable RFID reading in **OPTIONS** by filling in the checkbox of the **RFID** vertical layer.



FILES			FIELDS							
NAME	BYTE SIZE	READ TIME	ID	BAS	RAW	FMT	STD	OPT	DATA	STATUS
ECARD INFO	0 Bytes	0 ms	SERIAL NUMBER	08519923						No checksum
COM	28 Bytes	1 ms	CARD TYPE	ISO 14443-4/A						No checksum
DG1	95 Bytes	740 ms	CARD CAP	ATS: 0C 78 F7 B1 02 80 31 B9 73 84 21 60						No checksum
DG2	12604 Bytes	3029 ms								
DG3	0 Bytes	148 ms								
DG7	6414 Bytes	921 ms								
DG11	254 Bytes	251 ms								
DG12	14 Bytes	169 ms								
DG13	23 Bytes	170 ms								
DG14	395 Bytes	1 ms								
SOD	2264 Bytes	1 ms								

IMAGE

BAC PACE COM DG1 DG2 DG3 DG4 DG5 DG6 DG7 DG8 DG9 DG10 DG11 DG12 DG13 DG14 DG15 DG16 CVCA SOD Chip Auth Passive Auth Active Auth Terminal Auth

Note
 RFID function turns off automatically, if there is no RFID reader module built in the device.

6.6. MSR

Note

Magnetic stripe option is available on Combo Smart 'M' models.

Displays Magnetic Stripe data. Enable **MAGNETIC STRIPE** reading by selecting it on the **OPTIONS / GENERAL** layer.

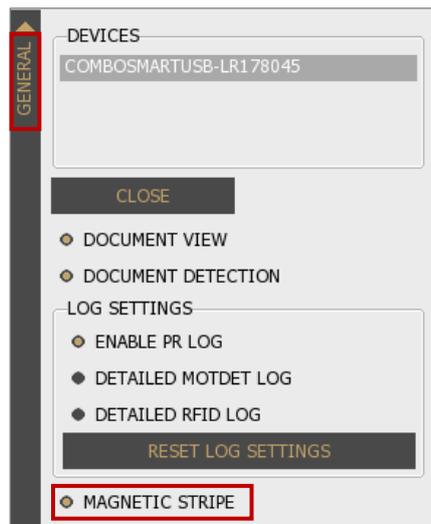


IMAGE	MRZ	VIZ	BCR	RFID	MSR	ALL	SUMMARY	OPTIONS	SAVE	LOAD	START
FIELDS											
ID	BAS	RAW	FMT	STD	OPT	DATA					STATUS
TRACK1	%B1234567812345678	^PUBLIC/JOHN Q^1106101982400156000000?					OK				
TRACK2	;1234567812345678=11061010000098240156?					OK					
NAME	PUBLIC JOHN Q					OK					
DOCUMENT NUMBER	1234567812345678					Checksum mismatch					
EXPIRY DATE	XX11-06-XX					OK					

Note

Magnetic stripe option turns off automatically, if there is no magnetic stripe reader built in the device.

6.8. SUMMARY

Brief summary of the personal data, document data and the results of the security crosschecks.

[Face compare](#) result is also displayed in the **SUMMARY** tab.

6.9. OPTIONS

Customize application properties, lights, logs and much more on the **OPTIONS** tab. For more details, please check the [OPTIONS](#) chapter.

6.10. SAVE

After a reading process, you have the option to save the given document. By default, the software compresses all available images and corresponding data into one **ZIP/PDF** or **XML** file that can be saved to a custom location.

Note

The application is able to save encrypted ZIP file. These files can only be decrypted in ADAPTIVE RECOGNITION's offline network. Not recommended for personal use.

6.11. LOAD

Load scanned documents, including images illuminated by various light sources, as well as corresponding data.

Note

This functionality is supported only for **.zip files** that have been saved earlier by ADAPTIVE RECOGNITION passport reader software.

6.12. CONNECT/START

Use the **[CONNECT]** button to access the selected document reader device or click on **[START]** to begin the scanning process after the device is connected successfully.

Note

When reading contact chip card, click on **[START]** to begin the scanning process.

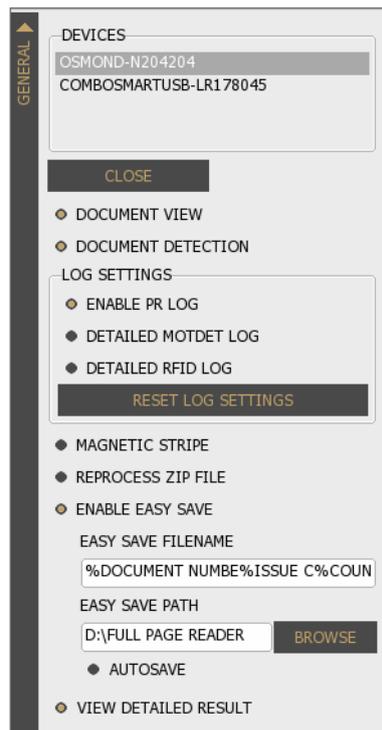
7. OPTIONS

7.1. GENERAL

DEVICES

OPTIONS > GENERAL > DEVICES

You can see the list of document scanners connected to your computer.



Note

You can work with only one device at a time. Also, you can navigate across devices by clicking on the chosen one.

DOCUMENT VIEW

OPTIONS > GENERAL > DOCUMENT VIEW

Crops and rotates documents into upright position.

Note

Automatic document rotation is performed properly if the **DOCUMENT VIEW** mode and **ADVANCED OCR MODE** are both selected before the starting of the scanning process.

DOCUMENT DETECTION

OPTIONS > GENERAL > DOCUMENT DETECTION

Enable/Disable the automatic document presence detection mode (motion detection). This feature senses documents placed on the scanner glass surface. Whenever a document is present, the software scans images of the document, as configured in **OPTIONS / CAPTURE**.

LOG SETTINGS

OPTIONS > GENERAL > LOG SETTINGS

The Full Page Reader application is equipped with a configurable logging feature to support any troubleshooting activities with ADAPTIVE RECOGNITION support team. By enabling different log options, you can include various events of the passport reader software in the log files.

Note

Enabling detailed RFID logging is increasing processing time.

- **ENABLE PR LOG**
Enable/Disable logging
- **DETAILED MOTDET LOG**
Enable/Disable detailed logs for motion detection.
- **DETAILED RFID LOG**
Enable/Disable detailed logs for RFID communication

Hint

Your log file is located at:

Windows: c:\ProgramData\gx\pr\pr.log

Linux: ~/tmp/pr.log

MAGNETIC STRIPE

OPTIONS > GENERAL > MAGNETIC STRIPE

Depending on your hardware configuration, you can read magnetic stripe data from documents. By enabling **MAGNETIC STRIPE**, FPR is listening for the Magnetic Card Reader. When you swipe any card equipped with magnetic stripe, the software automatically reads data from it and displays on the **MSR** tab.

REPROCESS ZIP FILE

OPTIONS > GENERAL > REPROCESS ZIP FILE

When loading .zip files saved earlier, the program either process them again with your current software version (**REPROCESS ZIP FILE** is enabled) or displays the original saved data (**REPROCESS ZIP FILE** is disabled). This option enables to perform OCR process and optical authentications using the current FPR application setup.

ENABLE EASY SAVE

OPTIONS > GENERAL > ENABLE EASY SAVE

The easy save option is designed to make frequent document saving simpler. Just select **ENABLE EASY SAVE** then set the **filename** and **path**. Afterwards there is no need to browse path and specify filename when saving .zip files: the software creates the filename automatically based on the configured template, then saves the .zip to the path specified.

Note

If the **filename** contains the extension, the program saves in the corresponding format (pdf, xml, or encrypted zip).

If you turn **AUTOSAVE** on, results of all scanning process will be saved automatically. By using this option, there is no need to click on the **[SAVE]** button anytime.

Note

When using easy save, determine the filename syntax and path before first scanning. This option will save every scanning into the same path.

Through easy save the ZIP files cannot only be saved to the local file system, but they can be sent to remote systems through **ftp**, **ftps**, **http**, **https**, **smtp** protocols. To use this option the matching URL must be typed to the path (e.g., [ftps://ftp.myserver.com/shares](https://ftp.myserver.com/shares)). Afterwards the user settings can be entered by pressing the settings button.

Note

The given password is not saved in the computer, you have to type it after every program launch.

- White

OPTIONS > CAPTURE > LIGHTS > WHITE

Enable **White** illumination by filling in the checkbox.

An image scanned in white light is a simple photo of the document – as it can be seen by the human eye. It is usable for human inspection and for examination of background pattern or face photo.



- Infra

OPTIONS > CAPTURE > LIGHTS > INFRA

Enable **Infra** illumination by filling in the checkbox.

The [ICAO 9303](#) document specifies that for reading text and barcodes, images shall be scanned in infrared light (wavelength: 900 nm). In this illumination, the background patterns are not visible, so optical recognition algorithms provide better results.



- UV

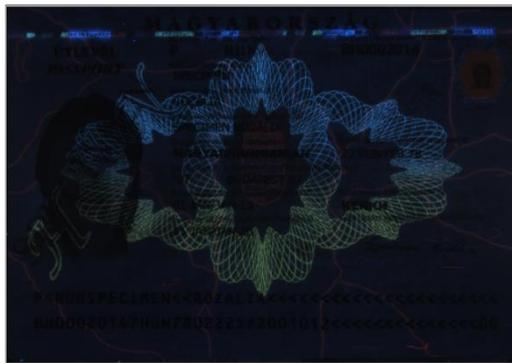
OPTIONS > CAPTURE > LIGHTS > UV

Enable **UV** illumination by filling in the checkbox.

Note

Check if available on your ID/Passport Reader model.

Images scanned in ultraviolet illumination can be used to check authenticity features (graphics and text printed with special fluorescent ink) which are only visible under UV light.



- Coaxial

OPTIONS > CAPTURE > LIGHTS > COAXIAL

Note

Check if available on your ID/Passport Reader model.

Enable **Coaxial** illumination by filling in the checkbox.

Coaxial light (a.k.a. on-axis light) is used to highlight surface texture: in this case, to examine a special foil. In this light, the various damages (scratches, cuts) of foils can be seen easily. Only a few document types have such foil.



- OVD

OPTIONS > CAPTURE > LIGHTS > OVD

Note

Check if available on your ID/Passport Reader model.

Enable **OVD** illumination by filling in the checkbox.

The Passport Reader system is capable of visualizing and removing simple holograms and most types of **OVI** patterns. Holograms can be observed by viewing the **OVD** image or the **clean OVD** image. In the case of the latter one, just the hologram can be seen from the document.



OVD



Clean OVD

- Photo

OPTIONS > CAPTURE > LIGHTS > PHOTO

Note

Check if available on your ID/Passport Reader model.

Enable the **Photo** camera on PRMc by filling in the checkbox at **OPTIONS / CAPTURE / LIGHTS**.

This is a high-resolution camera positioned in a way to see the photo area of passports. This high-resolution image makes it possible to check the details of the passport photo and its immediate surroundings. The images scanned by the **Photo** camera are required for the JURA IPI security feature.



7.2.2. Reflection Removal (RR)

OPTIONS > CAPTURE > REFLECTION REMOVAL

Improve OCR processing by eliminating glare on the scanned image of the document. By enabling RR, the device takes two pictures of the document from two different angles.

Note

Using RR is increasing total processing time, because the device takes more pictures.

- **White**

OPTIONS > CAPTURE > REFLECTION REMOVAL > WHITE

Enable RR on white images by filling in the checkbox.



- **Infra**

OPTIONS > CAPTURE > REFLECTION REMOVAL > INFRA

Enable RR on infra images by filling in the checkbox.



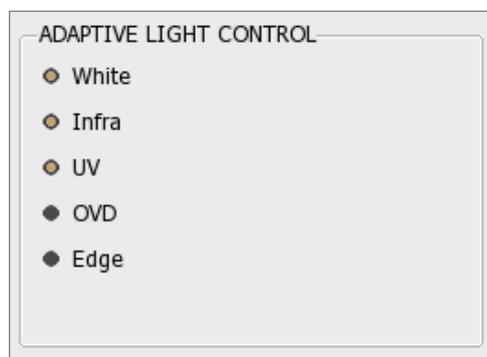
7.2.3. Adaptive Light Control

OPTIONS > CAPTURE > ADAPTIVE LIGHT CONTROL

ADAPTIVE RECOGNITION's **ADAPTIVE LIGHT CONTROL** feature compensates for external light interference and make routine operation independent of the environment. In order to use this feature, fill in the checkbox(es) you wish to apply before starting the illumination process.

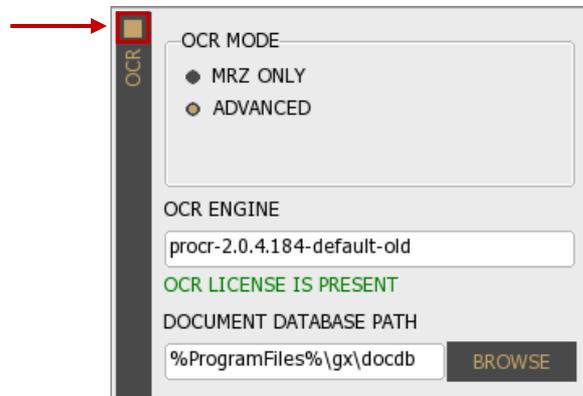
Note

Using **ADAPTIVE LIGHT CONTROL** is increasing total processing time, because the device takes more pictures.



7.3. OCR

Enable OCR process by filling in the checkbox on top-left corner of the layer.



7.3.1. OCR Mode

OPTIONS > OCR > OCR MODE

Select between two OCR modes to configure the OCR tasks to be performed.

- **MRZ ONLY**

OPTIONS > OCR > OCR MODE > MRZ ONLY

Select **MRZ ONLY** mode to get the data of the MRZ field from any ICAO-9303 standard document. When using this filter, no other OCR-related task is performed in order to ensure the fastest processing time. This option does not return any data from the Visual Inspection Zone (VIZ).

- **ADVANCED**

OPTIONS > OCR > OCR MODE > ADVANCED

Select **ADVANCED** mode to enable (if you have installed before) VIZ (or VIZ+Auth) engine besides MRZ to read document-specific data from the Visual Inspection Zone of different national documents. When using the device in **ADVANCED** mode, the following OCR-related functionalities are performed automatically:

- UV dull paper check (if the device has a built-in UV illumination source)
- B900 ink check
- Automatic document cropping and rotation
- Face photo cropping and face comparison

 Note

ADVANCED mode is increasing processing time.

PROCESSING LOG

```

***** Processing number 5 *****
Capture time (UV): 1247 ms
Capture time (OVD): 608 ms
Capture time (White): 84 ms
Capture time: 2166 ms
OCR time: 1027 ms
Total processing time: 3426 ms

***** Processing number 6 *****
Capture time (UV): 1268 ms
Capture time (OVD): 555 ms
Capture time (White): 93 ms
Capture time: 2110 ms
OCR time: 55 ms
Total processing time: 2362 ms
        
```

} ADVANCED mode

} MRZ ONLY mode

7.3.2. OCR Engine

OPTIONS > OCR > OCR ENGINE

The Optical Character Recognition process of each document is performed by the **OCR ENGINE**. The default package contains the PR OCR engine, which reads the MRZ field from any ICAO 9303 standard document.

In some cases, OCR engines are trained for specific documents in order to provide additional information for authentication and/or VIZ reading (e.g., on ID type). Using such engines involves changing the PR OCR engine.

Select among **installed OCR engines on your computer**, if you have several installed engines. A dropdown list shows your available engine(s). With a left-click you can select your appropriate one. After selection, software displays a status message about the required engine-license and its availability.

OCR ENGINE

- procr-2.0.6.29-world-auth
- procr

OCR ENGINE

OCR LICENSE IS PRESENT

Note

In the case of getting the "NO OCR ENGINE INSTALLED" message, please install your OCR engine package.

The passport reader software package and OCR engine are protected by software license. You need valid license to use **PR Software features** (Image capturing, RFID reading), as well as for performing **MRZ OCR+Barcode Reading**. Optionally, you also need license to use any specific OCR engine trained to perform **VIZ reading and Authentication** of certain documents. Licenses are stored on the document scanner device and/or on a USB dongle.

The green status message (displayed under OCR engine) indicates valid license.

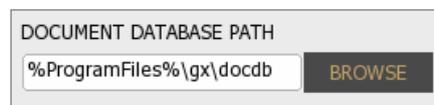
Possible error messages in processing log, referring to licenses:

- (3:ERRO) [prapi] > (cmd:2008006f) (1012) - Hardware key does not work properly [prapi] (license).
→ It is referring to the **missing PR software license**.
Please, contact your ADAPTIVE RECOGNITION sales representative to ask for license update.
- (3:ERRO) [prdoc] > Ocr read: FAILED: Hardware key does not work properly [gxmodule].
→ It is referring to the **missing VIZ OCR and/or MRZ OCR+Barcode Reading license**.
Please, contact your ADAPTIVE RECOGNITION sales representative to update your licenses.

7.3.3. Document Database Path

OPTIONS > OCR > DOCUMENT DATABASE PATH

Define the path for reference image database for authentication purposes. The reference images are displayed in the **AUTH** check fields at **VIZ** tab. This path is set by default as you install VIZ OCR+Auth engine to your computer. The purpose of this function is to allow visual comparison of authenticated document sections with images stored in a reference database. If document database is not set or installed, the authentication feature still operates and its results are returned.



The values of the AUTH fields are in thousandths.

The limits are the following:

- 0-329: **ERROR**
- 330-659: **WARNING**
- 660-1000: **OK**

Note

These limits are ADAPTIVE RECOGNITION standard values.

IMAGE	MRZ	VIZ	BCR	RFID	ALL	SUMMARY	OPTIONS	SAVE	LOAD	START
- FIELDS										
ID	BAS	RAW	FMT	STD	OPT	DATA				STATUS
EXPIRY DATE	01	JAN/JAN 20				No checksum				
ISSUE ORG	KEKKH					No checksum				
DOCUMENT TYPE	PP					No checksum				
DOCUMENT PAGE	D					No checksum				
DOCUMENT SUBTYPE	2012					No checksum				
FACE					No checksum					
SIGNATURE					No checksum					
SECURITY PATTERN COMPOSITI	895					OK				
AUTH1	890					OK				
AUTH2	910					OK				
AUTH3	800					OK				
AUTH4	730					OK				
AUTH5	940					OK				
AUTH41	1000					OK				
AUTH42	1000					OK				
SECURITY PAPER CHECK	950					OK				
- IMAGE										
										



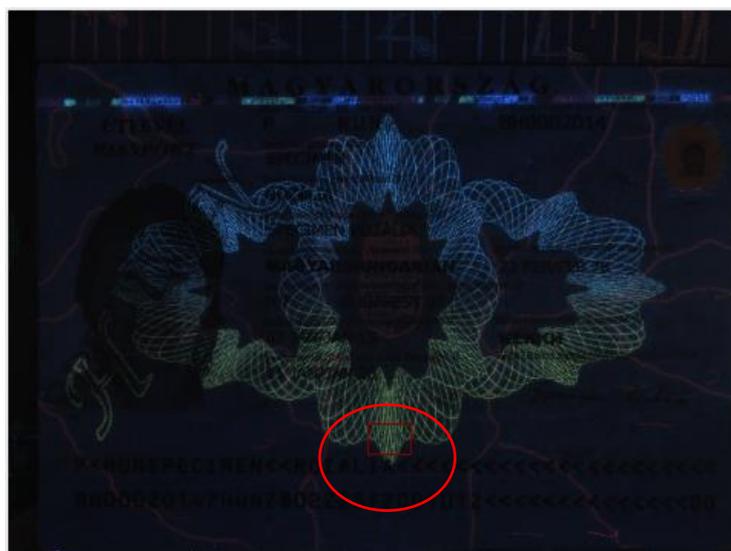
Scanned image



Reference image

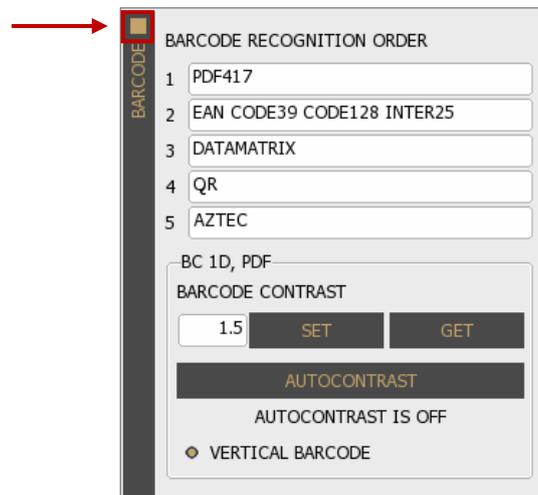
 Hint

By double clicking on the corresponding AUTH field, the accurate place of the image fragment will be shown in the complete image.



7.4. BARCODE

Enable **BARCODE** recognition by filling in the checkbox on top left corner of the layer.



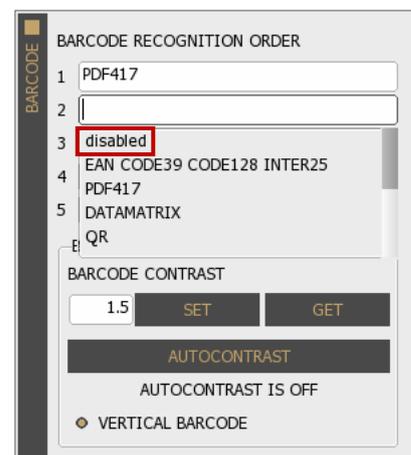
Note

If you do not need barcode recognition, disable this option to speed up processing.

7.4.1. Barcode Recognition Order

OPTIONS > BARCODE > BARCODE RECOGNITION ORDER

Set the order of tries in recognizing barcodes. Different types of barcodes are available to read. You can select your appropriate ones from the dropdown lists. Use **disabled** value for not needed types.



Note

Unnecessary barcode detection increases processing time. Select only necessary/possible types.

7.4.2. Barcode Contrast

OPTIONS > BARCODE > BARCODE CONTRAST

Note

The following properties affect only 1D-type ([EAN](#), [CODE39](#), [CODE128](#), [INTER25](#)) and [PDF417](#) barcodes.

Set **BARCODE CONTRAST** to improve the accuracy of reading of low quality or damaged barcodes.

- Possible values: 0.3 – 7.0
- Default value: 1.5
- Recommended value: 1.2
- Autocontrast values: -1, -2 and -3



Hint

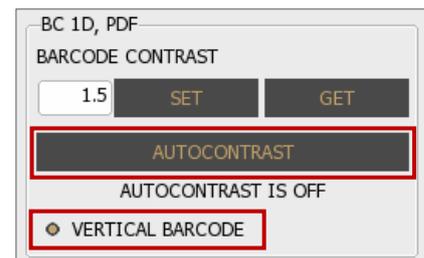
By clicking on the **[GET]** button you will get the current value.

Note

For more information on **BARCODE CONTRAST**, please contact ADAPTIVE RECOGNITION support team.

AUTOCONTRAST

It is recommended to use instead of manual settings. To utilize this function, click on the button. During operation the automation may turn off, thus the current status of the function is displayed below the **AUTOCONTRAST** button.



VERTICAL BARCODE

Enable/Disable recognition of barcodes that are positioned on the document in vertical orientation.

Note

Enable this function to maximize the efficiency of barcode reading.

7.5. RFID

View the **RFID** layer in the **OPTIONS** tab to customize the parameters of RFID chip reading: authentications to perform and data groups to read.

RFID Authentication is a process that validates claimed identity of a participant in an electronic transaction. RFID chips may support different types of authentication methods.

Note

In the case of **contact chip reading**, the extracted data is displayed in the **RFID** tab.

FILES			FIELDS							
NAME	BYTE SIZE	READ TIME	ID	BAS	RAW	FMT	STD	OPT	DATA	STATUS
ECARD INFO	0 Bytes	0 ms	SERIAL NUMBER		084AB093					No checksum
COM	27 Bytes	0 ms	CARD TYPE		ISO 14443-4/A					No checksum
DG1	93 Bytes	754 ms	CARD CAP		ATS: 09 78 F7 D4 02 80 82 90 00				No checksum	
DG2	17017 Bytes	3708 ms								
DG3	0 Bytes	52 ms								
DG7	5421 Bytes	735 ms								
DG11	243 Bytes	90 ms								
DG12	23 Bytes	51 ms								
DG14	745 Bytes	0 ms								
SOD	1890 Bytes	0 ms								

7.5.1. TRY BAC

OPTIONS > RFID > TRY BAC

Enable/Disable **TRY BAC** authentication.

TRY BAC forces the Basic Access Control ([BAC](#)) in case of appropriate and also inappropriate messages received by the document.

The protocol for Basic Access Control is specified by ICAO. When performing Basic Access Control, the terminal authenticates the user by confirming they have physical access to the [MRTD](#)'s data page. Such confirmation is done by requesting MRZ data (document number, birth date and expiry date) from user to start the BAC process.

RFID

- TRY BAC
- ACTIVE AUTH
 - ONLY IF CHIP AUTH IS NOT PRESENT
- PASSIVE AUTH
- CHIP AUTH
- TERMINAL AUTH
- SELECT APPLICATION

DG1

DG2

DG3

DG4

DG5

DG6

DG7

DG8

DG9

DG10

DG11

DG12

DG13

DG14

DG15

DG16
- MAXIMUM AIR SPEED
-
-
- COMPARE FACE
-

7.5.2. ACTIVE AUTH

OPTIONS > RFID > ACTIVE AUTH

Enable/Disable **ACTIVE AUTHENTICATION**.

Active Authentication protects against chip cloning by verifying if DG15 is not a copy. It is basically a two-way interaction between the reader and the document that involves communication with the non-accessible memory of the chip. AA result is valid only after the Passive Authentication has been executed successfully.

7.5.3. PASSIVE AUTH

OPTIONS > RFID > PASSIVE AUTH

Enable/Disable **PASSIVE AUTHENTICATION**.

Passive Authentication is used to check if the data on the RF chip of the electronic document is authentic and unforged.

The authentication process includes two main steps:

- Authenticating the [SOD](#)
- Verifying the hashes of each DG file by comparing them to the hashes stored in SOD

For authenticating the SOD, the [CSCA](#) certificate of the document is required. Such certificate should be downloaded from the website of the document issuing authority, from ICAO PKD or via other trustworthy source. Once downloaded, it should be copied to: **C:\ProgramData\gx\pr\certs** (Windows) or **/var/gx/pr/certs** (Linux) or loaded manually with the **[LOAD CERTIFICATE]** button.

Supported certificate formats:

- .cer
- .crt
- .crl
- .cvcert
- .der
- .ldif
- .ml
- .pem

Note

The corresponding private key must have the same name as the cvcert it belongs to, only with pkcs8 extension.

 Hint

The Passport Reader software package is implemented with German Master List that includes CSCA certificates of hundreds of documents.

You may download and use the latest version of this Master List from <https://www.bsi.bund.de/SharedDocs/Downloads/DE/BSI/ElekAusweise/CSCA/GermanMasterList.html>

7.5.4. CHIP AUTH

OPTIONS > RFID > CHIP AUTH

Enable/Disable **CHIP AUTHENTICATION**.

Chip Authentication is used to uncover cloned RF chips: it is a more advanced alternative to Active Authentication. Similarly to AA, CA also involves communication with the secure memory of the chip. CA is obligatory in EU passports.

7.5.5. TERMINAL AUTH

OPTIONS > RFID > TERMINAL AUTH

Enable/Disable **TERMINAL AUTHENTICATION**.

TA is designed to provide additional protection to sensitive data (fingerprint (DG3) and iris (DG4)) stored in the RFID chip. Without performing TA, the passport denies access to such biometric information as TA requires the inspection system to prove that it is authorized to access the sensitive information within the RFID chip.

TA consists of two major phases:

1. Building the certificate chain of public keys
2. Verifying if the terminal has the private key using the certificate chain

In order to perform both phases, the DV public and IS public certificates as well as the IS private key are required. These files can be loaded in the same way as PA certificates (see above). If all certificates are loaded, TA is performed automatically by the FPR and the sensitive data is displayed in the **RFID** and **SUMMARY** tabs.

 Note

FPR is only able to perform TA if the private key is available and loadable in file format.

7.5.6. SELECT APPLICATION

OPTIONS > RFID > SELECT APPLICATION

Enable/Disable **SELECT APPLICATION** function. If it is selected, the Passport Reader software automatically selects a supported application on the RFID chip: ePassport, eID, eDL or IDL.

7.5.7. DG1-16

OPTIONS > RFID > DG1-16

Enable/Disable document's RFID data groups to read.

Some of the data groups need to have certificate to access its data. Required certificates can be obtained from the authority of the local national government.

7.5.8. MAXIMUM AIR SPEED

OPTIONS > RFID > MAXIMUM AIR SPEED

Set the maximum baud-rate for communication with the RFID chip.

7.5.9. LOAD/UNLOAD CERTIFICATE

OPTIONS > RFID > LOAD/UNLOAD CERTIFICATE

Browse and select your certification file that enables you to run RFID security mechanisms (PA and TA).

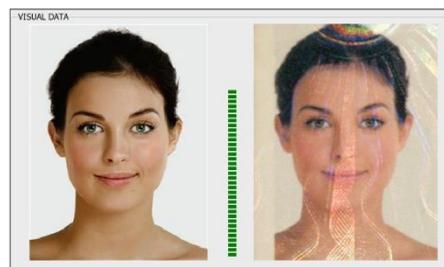
Note

Private keys (.pkcs8) cannot be loaded with **[LOAD CERTIFICATE]** button.

7.5.10. COMPARE FACE

OPTIONS > RFID > COMPARE FACE

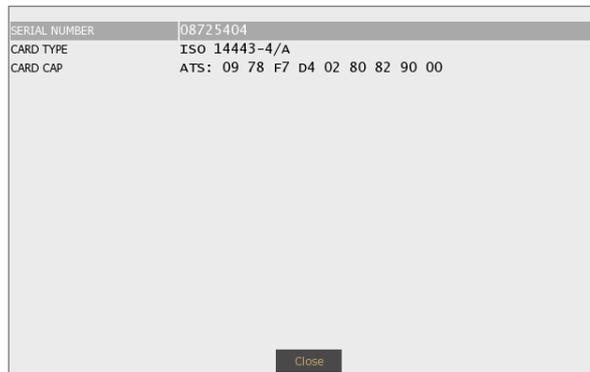
Enable/Disable comparing the face photo stored in chip against the one printed on the data page.



7.5.11. RFID DETECTION

OPTIONS > RFID > RFID DETECTION

Use the **RFID DETECTION** feature to determine if there is an eDocument positioned onto the document reader device. If you click on this button, a window will pop up with the fundamental data of the document/chip.



Note

This feature works only when the document is within 10 mm from the RFID antenna of the device.

7.6. MANUAL SETTINGS

Fine-tune your software by changing default system property values to customize operation according to your preferences.

Note

Changing parameters may have negative effect on system performance and operation. If in doubt with the proper value, please consult with ADAPTIVE RECOGNITION support team.

7.6.1. PROPERTY NAME

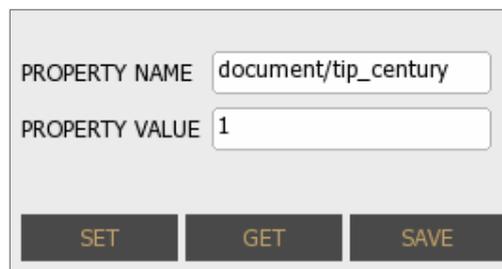
OPTIONS > MANUAL SETTINGS > PROPERTY NAME

Every property has a name and most properties have path as well. When referring to a property (e.g., in the FPR application) the path must be specified as well.

7.6.2. PROPERTY VALUE

OPTIONS > MANUAL SETTINGS > PROPERTY VALUE

The property value is a number or text that determines the effect of the property.



The screenshot shows a user interface for setting a property. It consists of two input fields: 'PROPERTY NAME' with the value 'document/tip_century' and 'PROPERTY VALUE' with the value '1'. Below the input fields are three buttons: 'SET', 'GET', and 'SAVE'.

Note

For more information on possible property values, please check the Passport Reader Property List.

7.7. PROCESSING

7.7.1. PROCESSING TIME

OPTIONS > PROCESSING > PROCESSING TIME

Brief summary of the **PROCESSING TIME** of each processing phase.

7.7.2. PROCESSING LOG

OPTIONS > PROCESSING > PROCESSING LOG

The **PROCESSING LOG** displays the main events of each document reading process.

PROCESSING

PROCESSING TIME

Capture time	3524 ms
OCR time	605 ms
BCR time	716 ms
RFID time	9627 ms
Total processing time	9780 ms

PROCESSING LOG

```

Opening system files...
Loading certificates...
  C:\ProgramData\gx\pr\certs\DEARHTESTIS00001.cvcert
  C:\ProgramData\gx\pr\certs\DETESTePass00002.cvcert
  C:\ProgramData\gx\pr\certs\DETESTEPASS00004.cvcert
  C:\ProgramData\gx\pr\certs\DETESTEPASS00005.cvcert
  C:\ProgramData\gx\pr\certs\DETESTePass00005_DEARHTESTDV00001.cvcert
  C:\ProgramData\gx\pr\certs\LINK_DETESTePass00002_00004.cvcert
  C:\ProgramData\gx\pr\certs\LINK_DETESTePass00004_00005.cvcert
  C:\ProgramData\gx\pr\certs\csca nl test 2.cer
  C:\ProgramData\gx\pr\certs\20180709_DEMasterList.ml
  C:\ProgramData\gx\pr\certs\20190925_DEMasterList.ml
  C:\ProgramData\gx\pr\certs\20210315_DEMasterList.ml
  C:\ProgramData\gx\pr\certs\DE_Test_CSCA_0006.crt
12 certificates loaded.
Connecting to 'COMBOSMARTUSB-LR178045' device...
The device is calibrated.

***** Processing number 1 *****
RFID search time: 481 ms
Serial no.: 08681DA7
Capture time (Infra): 1551 ms
Capture time (White): 792 ms
PACE time: 4720 ms
SELECT APPLICATION succeeded.
SELECT APPLICATION time: 195 ms
CHIP AUTHENTICATION succeeded.
CHIP AUTHENTICATION time: 683 ms
PASSIVE AUTHENTICATION:
>Authenticity cannot be determined [prfid] No appropriate CSCA certificate found!
PASSIVE AUTHENTICATION time: 505 ms
TERMINAL AUTHENTICATION:
>Entry not found [prfid] The certificate chain is absent or incomplete!
TERMINAL AUTHENTICATION time: 209 ms
          
```

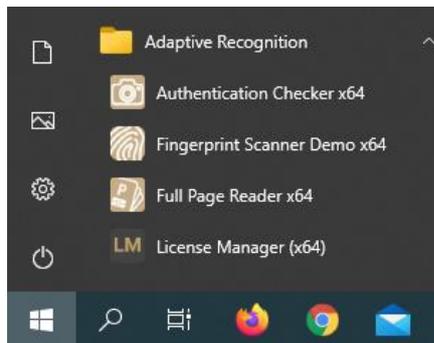
CLEAR

8. FAQ

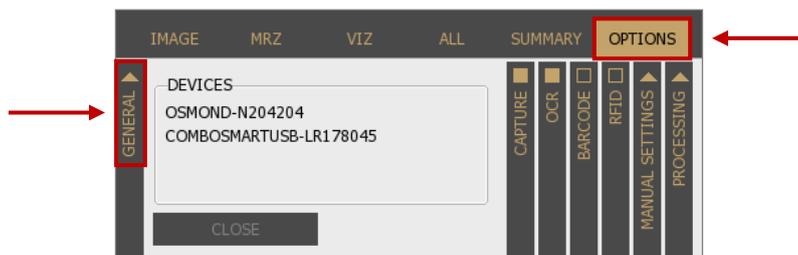
8.1. BASICS

8.1.1. How to connect reader before scanning?

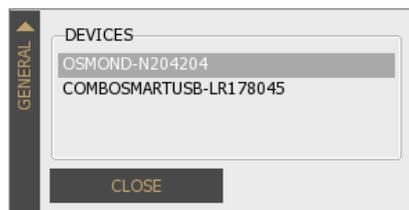
- 1) Open Full Page Reader (FPR) app



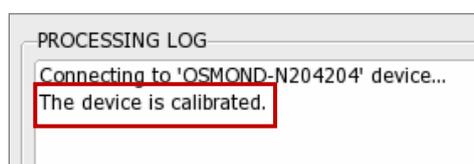
- 2) View **GENERAL** layer in **OPTIONS** tab to see available reader(s)



- 3) Connect reader to your system to gain access its features by
 - a) Clicking on the **[CONNECT]** button or
 - b) Clicking on the selected reader in the **DEVICES** list



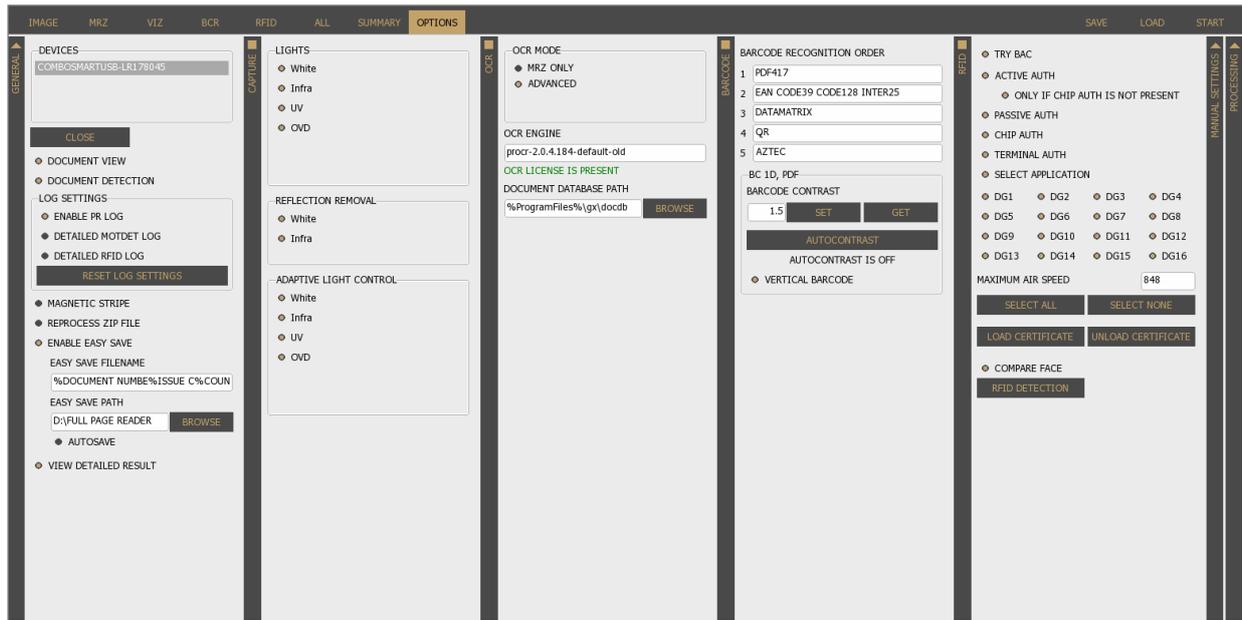
- 4) Check the reader's status in the **PROCESSING LOG**
If you get the "**The device is calibrated.**" message, your reader is ready to use.



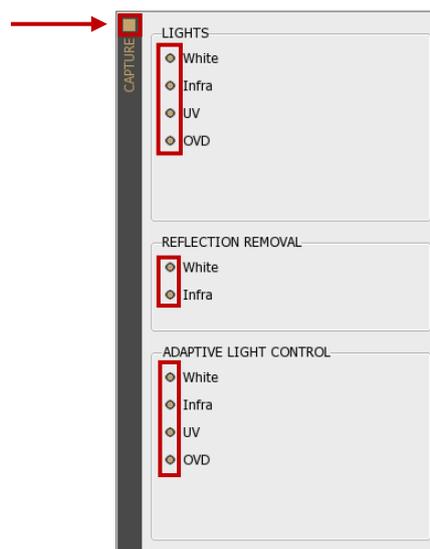
8.2. SCANNING

8.2.1. How to scan?

- 1) Connect reader
- 2) Open vertical layers in **OPTIONS** tab and enable/disable filters to customize the FPR's operation according to your needs.



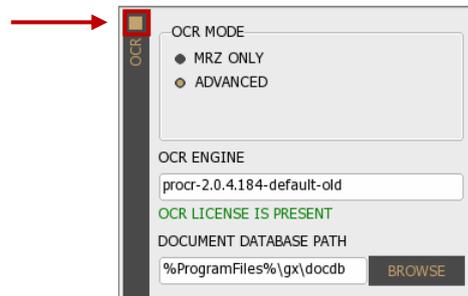
- a. Activate **CAPTURE** layer for scanning documents by filling in the checkbox and set the illumination types you wish to apply.



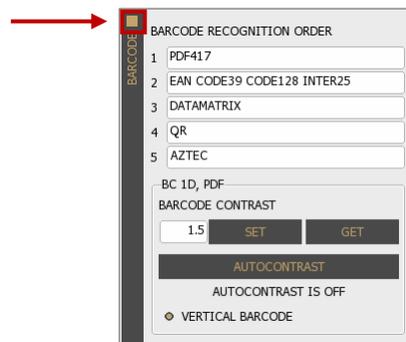
- b. Activate **OCR** layer by filling in the checkbox and select your **OCR ENGINE** for performing character recognition.

 Note

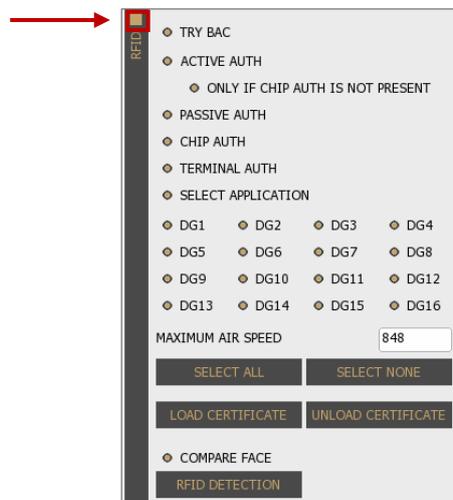
Select **ADVANCED** mode to read data from **MRZ** and **VIZ** fields as well.



- c. Activate **BARCODE** layer by filling in the checkbox to read barcode(s) from documents. If you expect different barcode types, you can set an order for faster process time.



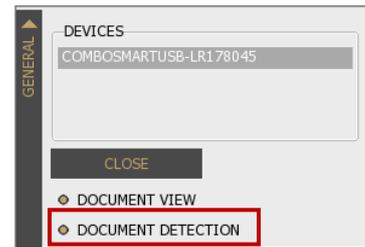
- d. Activate **RFID** layer by filling in the checkbox to read RFID chip data from e-documents. Select the data groups to read and the authentication mechanisms to execute.



- 3) Start scanning by pressing the **[START]** button or use **DOCUMENT DETECTION**.

8.2.2. How to enable document presence detection (aka. Motion Detection, Freerun Mode, Auto-scan)?

Select **DOCUMENT DETECTION** option on **OPTIONS / GENERAL** layer to enable document presence detection. This feature automatically scans images using the selected filters whenever a document is available on the reader's surface.



8.2.3. How to crop and rotate document?

Select **DOCUMENT VIEW** option before the starting of the scanning process on **OPTIONS / GENERAL** layer to crop and rotate documents into upright position.



8.2.4. How to read VIZ fields?

- Select **ADVANCED** mode on **OPTIONS / OCR** layer to read data from **VIZ**.



- Select your **VIZ-OCR** engine to use.



- Check the processed VIZ data of a given document on the **VIZ** tab.

Note

VIZ tab is only visible if you have activated on the **OCR** layer.

8.3. SAVE, LOAD, REPROCESS

8.3.1. How to save a scanning?

- 1) Select filters and scan a document
- 2) Choose from the following saving methods:
 - a. Click on **[SAVE]** and browse the path as well as specify the filename to finish the saving process.



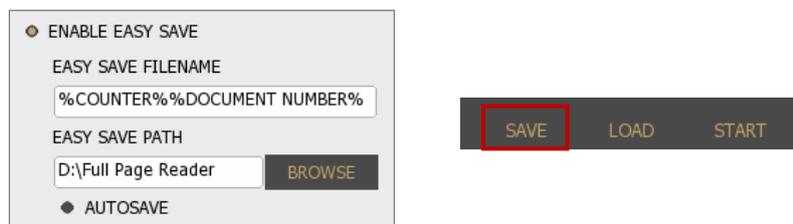
- b. Click on **[SAVE IMAGE]** on **IMAGE / DETAILS** layer to save the selected image. Browse the path and specify the filename to finish the saving process.



Note

SAVE IMAGE function is only able to save into **image format**.
ZIP/PDF or XML formats are not available options.

- c. Select **ENABLE EASY SAVE** and click on **[SAVE]** to preserve the selected scanning.



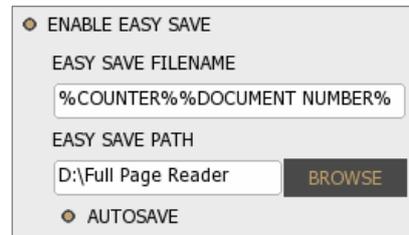
Note

At the first saving, you have to browse the path and define the filename, if the **EASY SAVE PATH** is not specified.

- d. Select **ENABLE EASY SAVE** and turn on **AUTOSAVE** to perform automatic saving.

Important!

If the **EASY SAVE PATH** is not specified, the automatic saving is not performed.



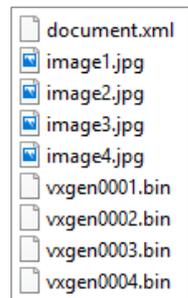
The screenshot shows a settings dialog box with the following fields and options:

- ENABLE EASY SAVE**
- EASY SAVE FILENAME**:
- EASY SAVE PATH**:
- AUTOSAVE**

- 3) If you have selected **ENABLE EASY SAVE**, you will find the images of the scanned document in the folder that you have selected at **OPTIONS / GENERAL / EASY SAVE PATH**.

8.3.2. What is included in the saved file?

- All **images** scanned by different light sources are available in original view.
- XML file with the **processed data** from document.
- Corresponding **binary data** for each image in .bin files.
- Copy of the **face photo** from RFID chip (if available).
- Copy of the **biometric data** from RFID chip (if RFID and CVCA certificate is available).



8.3.3. How to load or reprocess a previous scanning? What is the difference?

- **LOAD**

- 1) Click on the **[LOAD]** button.
- 2) Browse for your .zip file and click on it.
- 3) Open the selected file.
- 4) You get the original data and images in the app as it was processed earlier.



- **REPROCESS**

- 1) Select **REPROCESS ZIP FILE** option on **GENERAL** layer in **OPTIONS** tab.



- 2) Set different filters to review same document in different conditions.
I.e.: Select different OCR engine or barcode setting.
- 3) Click on the **[LOAD]** button.
- 4) Browse for your .zip file and click on it.
- 5) You get the reprocessed data as it was modified with new filters.

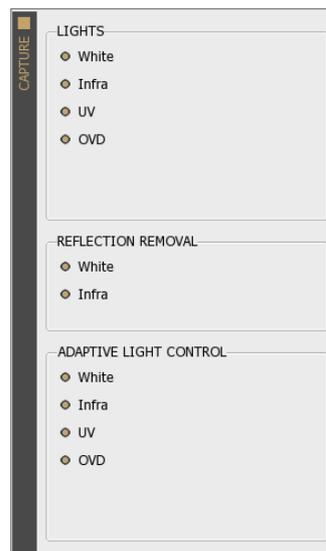
The difference between the two is that with the **LOAD** you get the original saved data in the app (you don't have to check the ZIP file) and with the **REPROCESS ZIP FILE** the saved data is processed again according to the actual or selected engine.

8.3.4. How to make a collection of sample documents to send to ADAPTIVE RECOGNITION?

- 1) Open FPR
- 2) Select all available illumination types for both LIGHTS and REFLECTION REMOVAL.

Note

REFLECTION REMOVAL ensures glare-free images that provides higher OCR accuracy.



- 3) Scan the document based on the following:
 - Make sure that the document is in standstill position while scanning is performed.
 - Protect the scanning window from direct sunlight or strong ambient light from the environment.
 - Scan both sides of the document.
 - In case of ID-1 and ID-2 size documents:
For the best OCR quality, please make scans with rotating the cards by 90° and 180° or positioning them randomly.
- 4) Save document(s) by clicking on the **[SAVE]** button – for training purposes, minimum 15 different scans needed from the same document type.

Hint

If you wish to scan more documents, using of **ENABLE EASY SAVE** and **AUTOSAVE** options are recommended to use to minimize the saving time.

9. ACRONYMS AND TECHNICAL TERMS USED IN THE DOCUMENT

API

Application Programming Interface

Aztec

One of the readable two-dimensional (2D) barcode types.

BAC

Basic Access Control: An RFID security mechanism.

BCR

Barcode Recognition. Barcodes are line drawings designed to be recognized easily by computers.

Code 39

One of the readable one-dimensional (1D) barcode types.

Code 128

One of the readable one-dimensional (1D) barcode types.

CSCA

Country Signing Certification Authority

EAC

Extended Access Control: An RFID security mechanism.

EAN

One of the readable one-dimensional (1D) barcode types.

FPR

Full Page Reader application

DataMatrix

One of the readable two-dimensional (2D) barcode types.

ICAO

International Civil Aviation Organization

Interleaved 2 of 5

One of the readable one-dimensional (1D) barcode types.

ISO

International Organization for Standardization

MRTD

Machine Readable Travel Document

MRZ

Machine Readable Zone: Lower part of an ICAO standard travel document. It contains text designed for reading optically with a travel document reader device.

OCR

Optical Character Recognition: Recognizing characters from a digitalized image.

OVD

Optically Variable Device: Security feature which shows different information, depending on the viewing and/or lighting conditions.

OVI

Optically Variable Ink: Printing ink that contains microscopic pigments acting as interference filters, resulting in large color shifts (strong variations in color) depending on the angle of observation or lighting.

PDF417

One of the readable two-dimensional (2D) barcode types.

QR Code

One of the readable two-dimensional (2D) barcode types.

RFID

Radio Frequency Identification: System based on built in chip that contains data and can communicate through air.

SDK

Software Development Kit

SOD

Document Security Object

VIZ

Visual Inspection Zone: Upper part of an ICAO standard travel document. It may contain face photo image and textual, human readable data.

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AR Technical Support System (ATSS) is designed to provide you the fastest and most proficient assistance, so you can quickly get back to business.

Information regarding hardware, software, manuals and FAQ are easily accessible for customers who previously registered to enter the dedicated ATSS site. Besides offering assistance, the site is also designed to provide maximum protection while managing your business information and technical solutions utilized.

New User

If this is your first online support request, please create an account by clicking on this [link](#).

Returning User

All registered ATSS customers receive a personal access link via e-mail. If you previously received a confirmation message from ATSS, it contains the embedded link that allows you to securely enter the support site.

If you need assistance with login or registration, please contact atsshhelp@adaptiverecognition.com for help.

