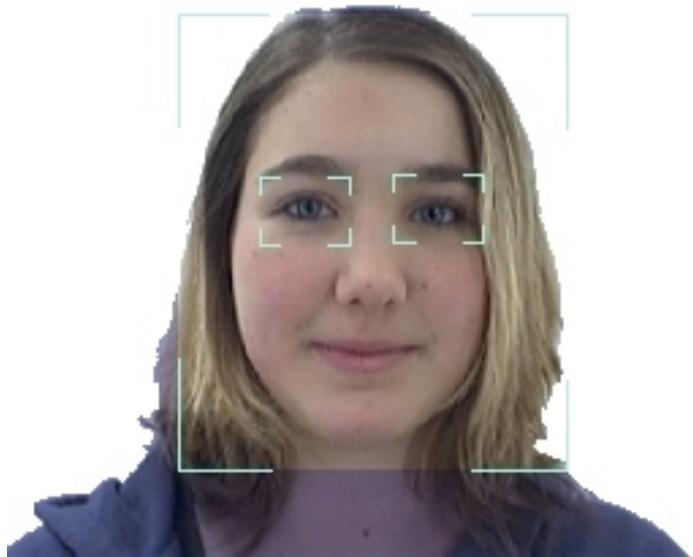


# Face Capturing Module

## to guarantee the picture quality for official documents



ICAO chose the face as the first and mandatory biometric trait for any kind of new international ID documents with biometrics. Besides the technical aspects face technology is already integrated in any passports as a photograph. The biometric trait of face recognition can be combined into the new ePassport microchip without affecting the existing passport application or the production process.

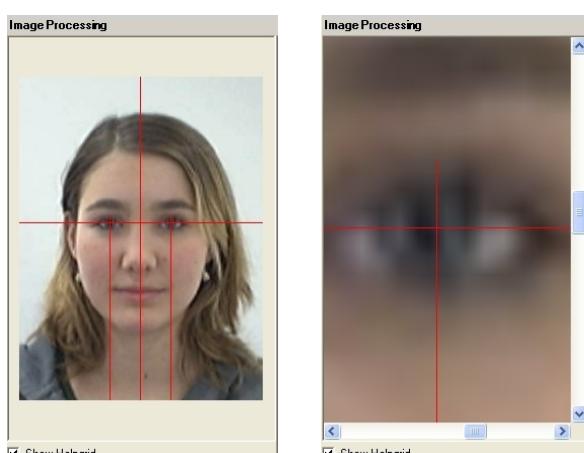
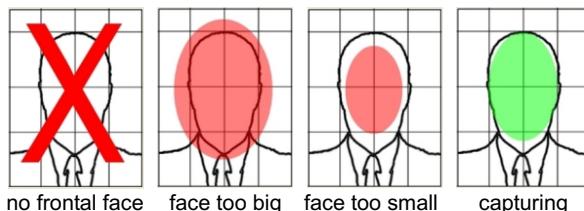
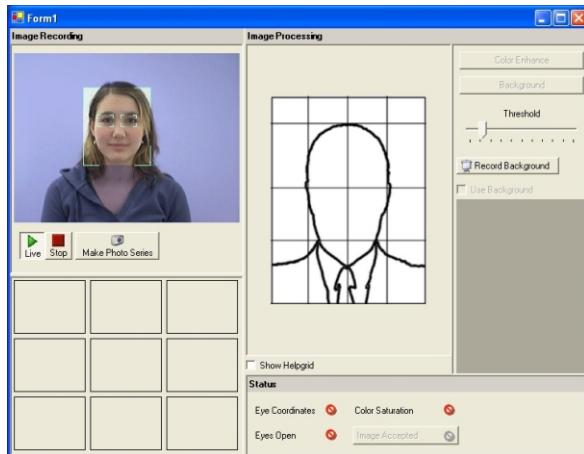
The new ICAO specifications for electronic passports require new qualified methods for the enrolment of personal and biometric data. Therefore ID Travel AG has developed a new System on order to support governments and authorities in capturing personal and biometric data and preparing them according to the ICAO guidelines.

The enrolment for the photo/face is done with a video camera or a digital photo camera. In the first step several life pictures of the applicant will be captured. The software checks the quality of the picture and propose the best one according to the photoguideline and ISO 19794-5 standards. Alternatively already existing pictures can also be scanned with any regular scanner from a paper based application form.

The following objectives of our facial image preparation to enhance the quality of the digitized passport photo will run in a full automated modus:

- **correction of the original photo's position**
- **adjustment to the size, 80% face in format 3:4**
- **brightness and contrast enhancement**
- **facial extraction and background removal**
- **control of ICAO requirements**
- **quality log file**
- **qualified rejection description**

All captured photos can be printed in the ID document and/or stored as JPEG/JPEG 2000 in the chip. We also offer to generate a template which can be printed in form of a 2D barcode within the document.



The live picture is shown in the left window "Image Recording". The facefinder helps the operator to define the correct position of the person.

After the person is positioned properly the operator will start the recording process with the button "Make Photo Series".

Now the status of the process is shown in the window "Image Processing".

Four different indication marks in the window "Image Processing" are describing the position of the person and help to qualify the pictures before recording.

Images were only taken when the green marker is shown.

The system can take up to nine pictures. All of them will be checked again for comparison with the ICAO specifications.

The best result will be marked with a blue border.

A manual selection of another picture is possible.

The selected picture will be processed according to the ICAO specification and shown in the window "Image Processing".

Now some additional manual corrections and checks are possible.

Enabling the "Helpgrid" checkbox gives the operator the possibility to check the automatic positioning.

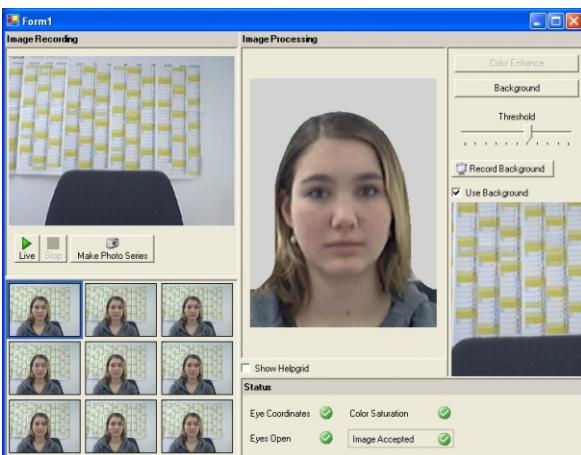
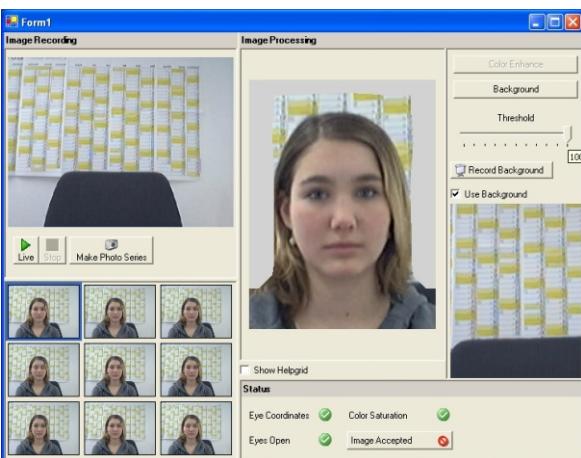
The three lines mark the center point of the eye as it is defined by ICAO specification.

The automatic positioning process tries to find the best position of the picture (zoom, picture trimming, rotation).

To get a better result, manual zooming into the picture is possible.



# Procedure description



## Color Enhancement

The color enhancement module can modify the picture in two modes:

- ICAO compliant enhancement:  
This version is restricted to regulations permitted by ICAO.
- Full enhancement:  
This version allows all the picture enhancement possibilities (color, brightness, gamma, ...).

## Background removal

Also Background removal is possible in two different modes:

- Simple background removal:  
For homogeneous uni-colored backgrounds. The background will be removed with just a klick.  
Adjustment with real-time response is possible with a throttle.
- Advanced background removal:  
For structured backgrounds with many colors the simple background removal will not work in an accurate way.  
For the use of the advanced background removal it is necessary to take a picture of the background. The algorithm can find reference patterns and decide which part of the picture belongs to the background or to the person.

After recording the background you use it just like the simple background removal. There is one button for start and a throttle for adjustment.

## Picture Output

The automatic quality control prevents a picture output if the picture will not fulfill checked requirements. In the following example the hairs are hiding too much from the left part of the face.



If the specifications do not require a special output format, all the captured information will be stored and processed in conformity with ICAO/ISO/CBEFF requirements.

If the project needs the support for LDS structure, our software prepare up to the full data block for the personalisation machine before the production. If the personalisation machine uses its own data preparation for LDS, we could send the data in requested formats.

The software is independent from any hardware and biometric technologies.

Integration of this software module in existing applications and the use of it as a stand-alone product is possible. Modification and customizing of the product can be done as well.

### Potential areas of application:

- Picture recording for passports
- Picture recording for ID-cards
- Picture recording for photo-credit cards
- Picture recording for company cards
- Picture recording for visitor cards
- Online production of fair-visitor-cards
- For any application a good photo is necessary



### Headquarters

ID Travel AG  
Tellenmattstrasse 23  
6317 Oberwil  
Switzerland

### Office Munich

ID Travel AG  
Eugen-Saenger-Ring 1  
85649 Brunnthal  
Germany  
Tel.: +49 / 89 / 203080-1800  
Fax: +49 / 89 / 203080-1809

eMail: [info@id-travel.ch](mailto:info@id-travel.ch)  
<http://www.id-travel.ch>

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