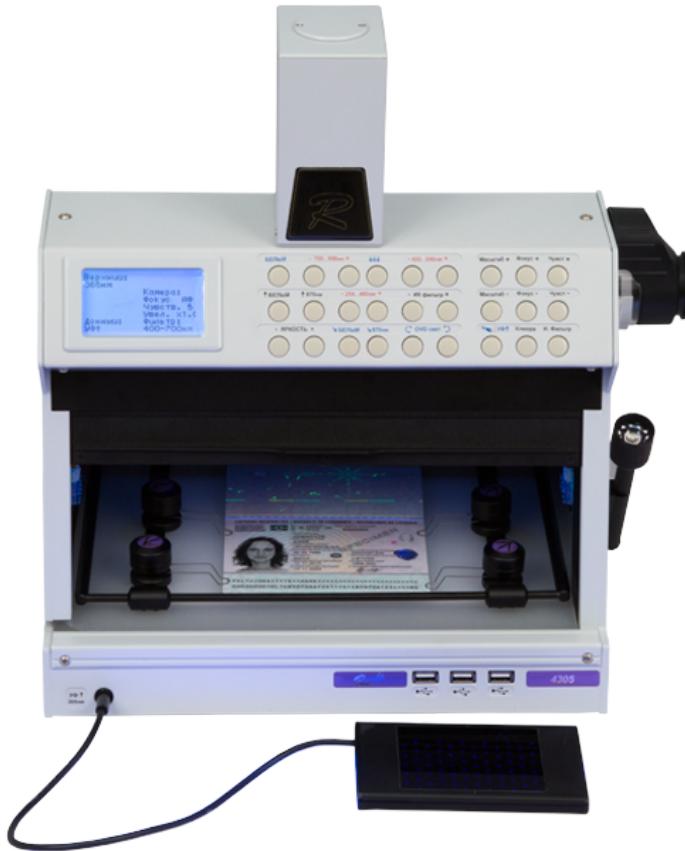




Video spectral comparator Regula 4305DMH



The device is intended for advanced authenticity verification of passports, ID cards, travel documents, visa stamps and seals, including but not limited to entry permits, driving licenses, vehicle registration certificates and other vehicle related documents, banknotes, revenue and special stamps, securities and other documents with security features.



The comparator is constructed as a single unit for desktop use in aluminum metal body. It is equipped with a built-in RFID reader. The device has a spacious working area over the object stage, clamps for fixing examined documents and a special shield protecting from harmful effects of ultraviolet radiation.

The device is operated via the front panel with control buttons or/and [Regula Forensic Studio](#) software. The control buttons are responsible for the activation of light sources and adjustment of camera parameters in different examination modes. The latter are displayed on the LCD display.

Video spectral comparator **Regula 4305DMH** is equipped with a torch and a modified 10x magnifier Regula 1003M with two white light sources. The front panel of the device has a port for connection of a UV bottom lighter, three available USB-2.0 ports — for additional external devices, such as a spectral luminescent magnifier [Regula 4147](#) used in anti-Stokes examination, thermostage [Regula 4168](#) or a magneto-optical visualizer [Regula 4197](#).

Functionality

- Obtaining and processing of images
- Reading RFID tags
- Examinations on different levels
 - **protection of the document basis**
 - paper opacity, watermarks, security fibers, planchets, security threads, foil stamping, pole feature, all types of windows, transparent vanish coating, shadow images, etc.
 - **printing methods**
 - *intaglio*: texts, guilloche frames, rosettes and vignettes, microprinting, latent images and moire patterns, signs for the visually impaired, blind embossing, colour shifting ink, including OVI with embossing and latent images, etc.
 - *letterpress*: serial numbers, texts, barcodes, etc.
 - *offset printing* including Orlov and rainbow printing: texts, microprinting, moire patterns, background and anti-copy patterns, etc.
 - *screen printing*: security features with optically variable effects, etc.
 - see-through register
 - perforation
 - **physicochemical protection**
 - anti-Stokes luminescence
 - UV luminescence with different wavelength
 - IR luminescence
 - **complex security features:**
 - holographic images, OVD
 - retroreflective protection
 - security features with IR-metameric ink
 - special polymer coating of security laminates
 - laser engraving
- **Additional examination of**
 - fragments of document images depending on the degree of absorption or reflection of IR light
 - document alterations such as erasure, etching etc.
 - traces of signature forgery
 - extraneous lines (do not originally belong to the examined object) that are performed with IR opaque inks
 - blurred, crossed out entries, texts and images
 - document mechanical defects such as cuts, tears, folds, etc.
- **Optionally:** detection of security elements with magnetic properties; including blurred and crossed out texts by [Regula 4197](#)

Application

- Border control and immigration services
- Customs authorities



- Law-enforcement agencies
- Forensic laboratories
- Financial institutions
- Other agencies and organizations authorized to check documents

Delivery Set

- Torch
- Magnifier [Regula 1003M](#)
- Software [Regula Forensic Studio](#) for displaying video, device control, storing and processing of images
- UV bottom lighter
- Clamps for fixing examined documents
- Optionally:
 - PC
 - Case for device transportation



Light sources		
White	incident	
	2 oblique	
	23 oblique for hologram examination	
	external oblique	
	coaxial	
	bottom with adjustable intensity	
Ultraviolet, nm	incident	254
		313
		365
		400
	bottom (external)	365
infrared, nm	incident	700
		870
		950
	2 oblique	870
	bottom with adjustable intensity	870
high-intensity incident, nm	royal blue	450
	blue	470
	cyan	505
	green	530
	amber	590

Specifications		
Video camera	video signal type and resolution	1/2.5 MOS, 4 Mp, USB (YUV)
	magnification, times:	optical 20
		digital 2
		on-screen 100*
	maximum field of view, mm	202×113
Video output parameter	maximum resolution, pixels	1920×1080 (Full HD)
	frame rate with maximum resolution, frame/sec	25
Connection interface		USB 3.0

* – all magnifications are approximate and based upon a 24 inch monitor

Camera filters:

- fixed with bandpass, nm — 420–1100
- automatically installed with threshold, nm:
 - IR low-pass — 700
 - IR high-pass — 600, 650, 700

RFID reader:



- standards — ISO 14443: A and B types of RFID tags
- PC/SC-protocol support
- data exchange rate, Kbaud — 106, 212, 424, 848
- reading an RFID tag regardless of its position in the document
- anticollision: reading an RFID tag according to the MRZ

Maximum document size, mm — 210×300 (A4)

OS — Microsoft Windows XP (SP3), Windows Vista, Windows 7, Windows 8, Windows 10

ICAO MRZ reading for ID-1, ID-2, ID-3 documents — Yes

RFID reader (ISO 14443) — Yes (built-in)

1D and 2D Barcodes — Yes

QR — Yes

Hidden image (IPI) — Yes

Dimensions (length×width×height), mm — 380×260×420

Weight, kg — 10,5

Power supply, V — 12 ± 2

Power consumption, W — 60

Optionally: power supply through vehicle on-board system 12 V



Optional Accessories

1. Spectral luminescent magnifier Regula 4147

Light sources:

- incident white
- 2 high-intensity infrared 980 nm: spot and flood

Field of view, mm — 11,1×8,1

Sensor:

- type — CMOS
- megapixels — 3,1:
 - resolution, ppi — 4700
 - frame size, pixels — 2048×1536
- dynamic range, dB — 61



Camera filters — IR high-pass with threshold, nm — 660

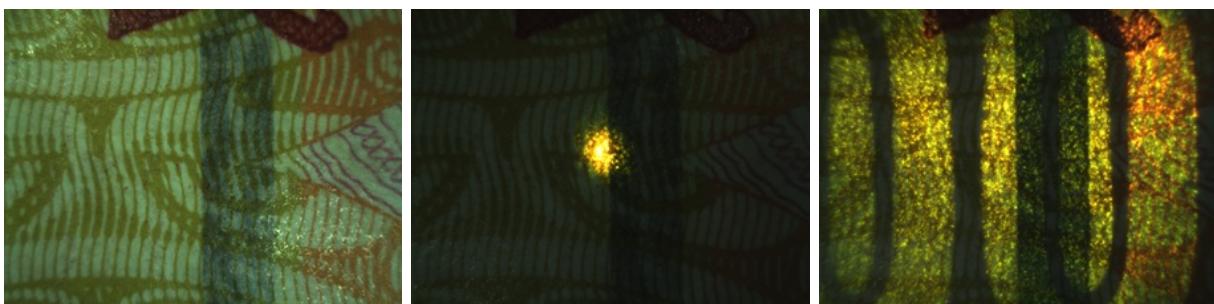
Connection interface — USB 2.0

Dimensions (length×width×height), mm, not more than — 94×62×52

Weight, kg, not more than — 0,2

Power supply voltage, V — 5

Power consumption, W, not more than — 12,5



Incident white

High-intensity infrared 980 nm:
spot

High-intensity infrared 980 nm:
flood



2. Thermostage Regula 4168

Functionality

- Examination of images and elements of banknotes and travel documents containing thermochromic ink at different temperatures.
- Examination of a composite security feature Feel®-ID developed by Giesecke & Devrient company. Feel®-ID is based on optically variable and thermochromic effect.

Temperature range, °C — +30...+80 with a step of 1 °C

Heated area (length×width), mm — 78×48

Dimensions (length×width×height), mm — 170×78×16

Weight, kg — 0,25

Power supply voltage: powered by the USB port of the video comparator, V — 5

Power consumption, W, max — 15



Temperature +20 °C

Temperature +35 °C

Temperature +50 °C



3. Visualizer of magnetic properties [Regula 4197](#)

Functionality

- Examination of magnetic security features in banknotes and travel documents in the mode of live video
- Visualization of magnetically hard and magnetically soft materials
- Possibility to distinguish magnetic inks by residual magnetization
- Carrying out non-destructive examination of objects with “hard” magnetic properties
- Reading latent magnetic strokes and codes
- Examination of damaged documents: reading blurred and crossed out texts printed with magnetic ink
- *Possibility to take magnetic ink intensity measurements in tesla (T)*



Field of view, mm — 14×18

Spatial resolution of the optical input system, mkm:

- frame size 1024×1280 pixel — 14
- frame size 512×640 pixel — 28

Connection interface — USB

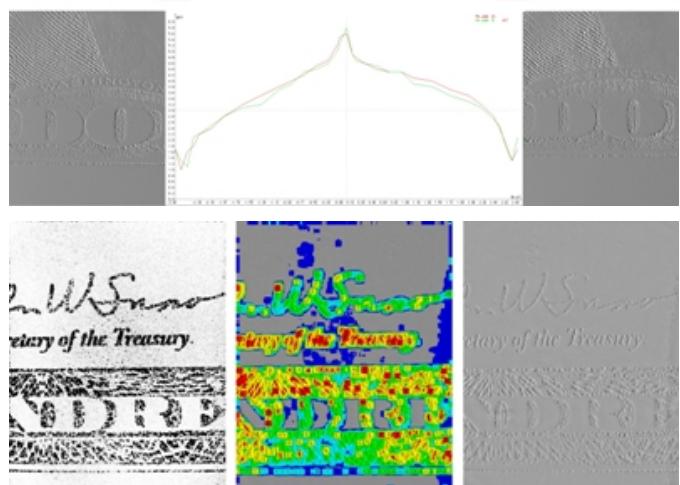
OS — Microsoft Windows XP (SP3), Windows Vista, Windows 7, Windows 8

Dimensions (length×width×height), mm — 59×113×50

Weight, kg — 0,49

Power supply voltage from a USB port, V — 5

Power consumption, W, max — 2,5



Black & White. Colour (magnetization intensity pattern).
Raw.



Regula Forensic Studio (4.0.9.82)

Main External devices Comparison Examination Processing Additional

Device

Basic light sources

Narrowband light sources

Adjustable light sources

Дополнительные освещения

Turn off all

Camera

Filters : 400 - 700 nm

Calibration / Presets

Additional examinations

Barcode(s) found : 0

RFID reader

Read data

Images

Regula 4303D

Videospectral Comparator Regula 4...

Disconnect Connection settings

Not selected

Get image Use pattern Compare with pattern

Save data Not selected

Examination script

Examination data

Data processing

Video preview

Regula Forensic Studio (4.0.9.82)

УКРАЇНА UKRAINE

ПАСПОРТ PASSPORT

Прізвище/ Surname ТКАЧЕНКО/TKACHENKO

Ім'я/ Given Names МАР'ЯНА/MARIANA

Громадянство/ Nationality УКРАЇНА/UKRAINE

Дата народження/ Date of birth 24 CEP/AUG 91

Стать/ Sex Ж/Ф

Місце народження/ Place of birth М. КІЇВ/UKR

Запис №/ Record No. 19910824-00026

Орган, що видає/ Authority XXXX

Підпис пред'явника/ Holder's signature

MRZ reading

Machine-readable zone (MRZ) reading

Checksums

Document Number :
Date of Birth :
Date of Expiry :
Personal Number :
Overall checksum :

MRZ strings:
MRZ Type:
Document Type Code: P
Issuing State Code: UKR
Surname and Given Name: TKACHENKO MARIANA
Family Name: TKACHENKO
Given Name(s): MARIANA
Nationality Code: UKR
Sex: F
Date of Birth: 910824
Date of Birth checkdigit: 2
Date of Expiry: 280112
Date of Expiry checkdigit: 1
Document Number: XX000000
Document Number checkdigit: 0
Optional Data: 1991082400026
Overall checkdigit: 6
Personal Number: 1991082400026

MRZ reading successfully

MRZ reading

Regula Forensic Studio (4.0.9.82)

Main External devices Comparison Examination Processing Additional

Device

Basic light sources

Narrowband light sources

Adjustable light sources

Дополнительные освещения

Turn off all

Camera

Filters : 400 - 700 nm

Calibration / Presets

Additional examinations

Barcode(s) found : 0

RFID reader

Read data

Images

Regula 4303D

Videospectral Comparator Regula 4...

Disconnect Connection settings

Not selected

Get image Use pattern Compare with pattern

Save data Not selected

Examination script

Examination data

Data processing

Video preview

Regula Forensic Studio (4.0.9.82)

Time, s Message

0.0728 Security Messaging channel required...

0.0746 BAC procedure ...

0.1036 ● BAC procedure ... (0x00000001, RFID_Error_NoError)

0.1184 ● Security Messaging channel established

0.1450 Retrieving of EF_COM (ePassport) ...

0.1533 Retrieving of EF_COM (ePassport) completed

0.1694 Retrieving of D01 (ePassport) ...

0.1993 Retrieving of D01 (ePassport) completed

0.2236 Retrieving of D01 (ePassport) ...

0.2712 Retrieving of D01 (ePassport) completed

0.2892 CA procedure ...

0.3409 ● CA procedure ... (0x00000001, RFID_Error_NoError)

0.3564 Retrieving of EF_SOD (ePassport) ...

0.3733 Retrieving of EF_SOD (ePassport) completed

0.3761 ⚠ Error (0x00000212) ICAO_Certificate_Ext_BaseC_IncorrectUsage!

0.3771 ⚠ Error (0x00000215) ICAO_Certificate_Ext_BaseC_IncorrectData

0.3795 Building and checking certificate chain

0.3826 ● Error (0x00000017) Auth_SignerInfo_Certificate_CertFindESCA

0.3830 Retrieving of EF_CVCA (ePassport) ... (0x00000001, RFID_Error_NoError)

0.3835 ● PA_DG1 (ePassport) ... (0x00000001, RFID_Error_NoError)

0.3895 ● PA_DG14 (ePassport) ... (0x00000001, RFID_Error_NoError)

0.2627 Retrieving of DG1 (ePassport) ...

0.4992 Retrieving of DG1 (ePassport) completed

0.5688 ● PA_DG15 (ePassport) ... (0x00000001, RFID_Error_NoError)

0.8619 AA procedure ...

2.2026 ● AA procedure ... (0x00000001, RFID_Error_NoError)

2.2220 Retrieving of DG2 (ePassport) ...

3.6449 ● Retrieving of DG2 (ePassport) completed

3.7424 ⚠ Error (0x00000001, RFID_Error_NoError)

3.7570 Retrieving of DG7 (ePassport) ...

5.0054 ● Retrieving of DG7 (ePassport) completed

5.0398 ● PA_DG13 (ePassport) ... (0x00000001, RFID_Error_NoError)

5.0617 Retrieving of DG1 (ePassport) ...

5.1285 Retrieving of DG1 (ePassport) completed

5.1379 ● PA_DG13 (ePassport) ... (0x00000001, RFID_Error_NoError)

5.1657 Retrieving of EF_CVCA (ePassport) ...

5.2085 Retrieving of EF_CVCA (ePassport) completed

5.2352 TA procedure ...

5.2407 ⚠ Error (0x00000041) TA_CantBuildCertificateChain

5.2583 ● TA procedure ... (0xFFFFFFF, RFID_Error_Failed)

5.3174 Data reading error (code 0x3000028) Error_Session_AccessControl...

8.4393 RFID chip is not detected

Clear

General information Authentication Data

File system Contents Document

Portrait Signature

Image type : Portrait

Source : DG2 (ePassport)

Size : 427 x 548

Chromacity : 24 bit(s)

Image

Text information

Image type : Portrait

Source : DG2 (ePassport)

Size : 427 x 548

Chromacity : 24 bit(s)

Image

RFID reading

RFID chip is not detected

RFID reader

Read data



Regula Forensic Studio (4.0.9.8)

Main External devices Comparison Examination Processing Additional

Image examinations

Image - VS.Img_194.jpg

Step : 299 Angle : 0 Block size : 4 Slope correction : No Phase

Latent image visualization

Measuring grid

Grid step : 50

Save Inversion Area Switch to another window Location Close all Window

Code de l'Etat émetteur EST

1. Perekonnanimi / Surname / Nom
MÄNNIK

2. Eesnimed / Given names / Prénoms
MARI-LIIS

3. Kodakondsus / Citizenship / Nationalité
EST

4. Sünniaeg / Date of birth / Date de naissance
22.01.1975

5. Isikukood / P
4750

6. Sugu / Sex / Sexe
7. Sünnikoht / Place of birth / Lieu de naiss
N/F EESTI/EST

8. Välja antud / Date of issue / Date de délivrance
31.12.2013

10. Kehitv. kuni / Date of expiry / Date d'expiration
31.12.2018

1920x1080 435 ppi

EXAMINATION DATA

Document : Общее

Object of examination : Данные 1

Image VS.Img_177.jpg Size : 2048x1536

Image VS.Img_178.jpg Size : 2048x1536

Image VS.Img_179.jpg Size : 1920x1080

Image VS.Img_180.jpg Size : 1920x1080

Image VS.Img_181.jpg Size : 1920x1080

Image VS.Img_182.jpg Size : 1920x1080

Image VS.Img_183.jpg Size : 1920x1080

Image VS.Img_184.jpg Size : 1920x1080

Image VS.Img_185.jpg Size : 1920x1080

Image VS.Img_186.jpg Size : 1920x1080

Image VS.Img_187.jpg Size : 1920x1080

Image VS.Img_188.jpg Size : 1920x1080

Image VS.Img_189.jpg Size : 1920x1080

Image VS.Img_190.jpg Size : 1920x1080

Image VS.Img_191.jpg Size : 1920x1080

Image VS.Img_192.jpg Size : 1920x1080

Image VS.Img_193.jpg Size : 1920x1080

Image VS.Img_194.jpg Size : 1920x1080

IPI reading

Regula Forensic Studio (4.0.9.8)

Main External devices Comparison Examination Processing Additional

Image examinations

Image - VS.Img_194.jpg

Step : 299 Angle : 0 Block size : 4 Slope correction : No Phase

Latent image visualization (1)

Measuring grid

Grid step : 50

Save Inversion Area Switch to another window Location Close all Window

Code de l'Etat émetteur EST

1. Perekonnanimi / Surname / Nom
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22.01.1975

5. Isikukood / P
4750

6. Sugu / Sex / Sexe
7. Sünnikoht / Place of birth / Lieu de naiss
N/F EESTI/EST

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31.12.2013

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31.12.2018

1920x1080 435 ppi

EXAMINATION DATA

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Image VS.Img_182.jpg Size : 1920x1080

Image VS.Img_183.jpg Size : 1920x1080

Image VS.Img_184.jpg Size : 1920x1080

Image VS.Img_185.jpg Size : 1920x1080

Image VS.Img_186.jpg Size : 1920x1080

Image VS.Img_187.jpg Size : 1920x1080

Image VS.Img_188.jpg Size : 1920x1080

Image VS.Img_189.jpg Size : 1920x1080

Image VS.Img_190.jpg Size : 1920x1080

Image VS.Img_191.jpg Size : 1920x1080

Image VS.Img_192.jpg Size : 1920x1080

Image VS.Img_193.jpg Size : 1920x1080

Image VS.Img_194.jpg Size : 1920x1080

IPI reading



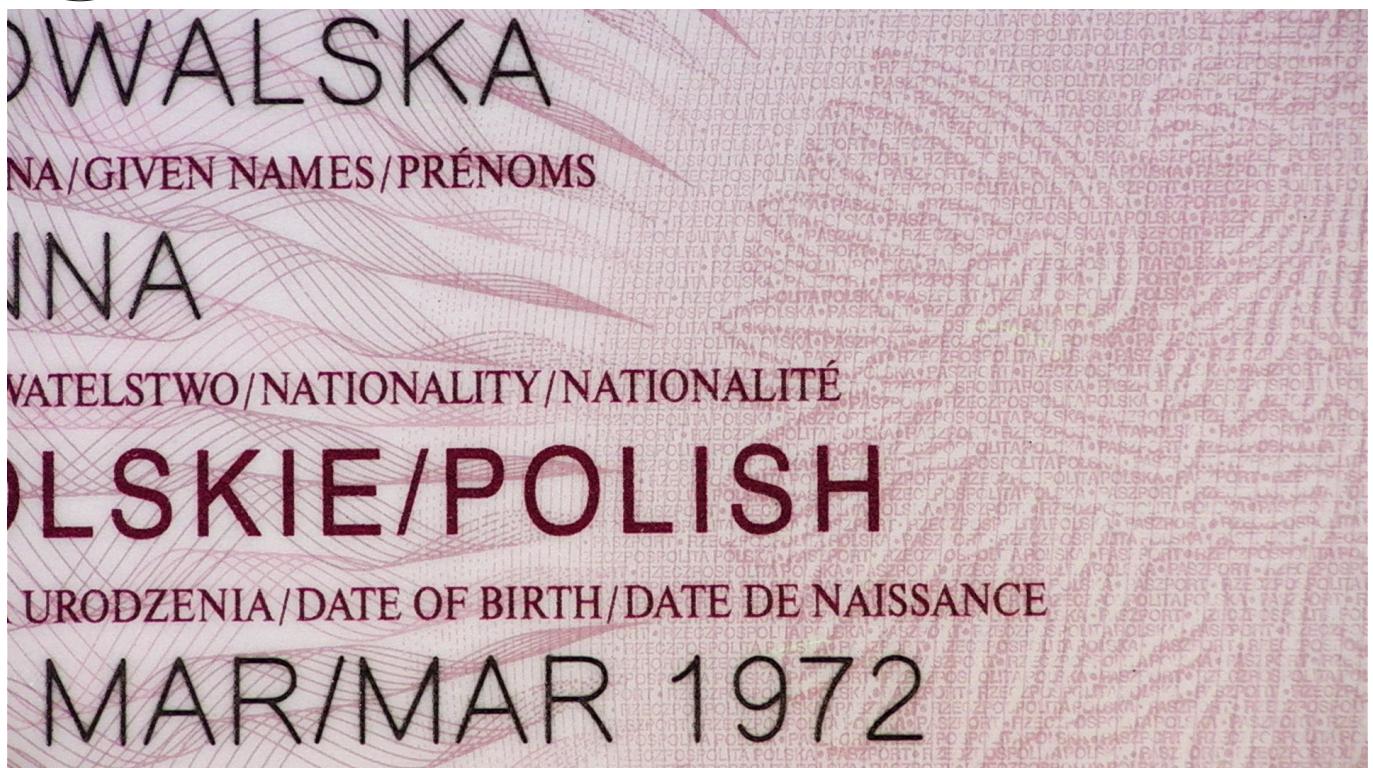
Screenshot of Regula Forensic Studio (4.0.9.2) software interface showing the examination of a specimen passport from Latvia.

The main window displays the passport page with the text "SPECIMEN" and the number "LV9000947". The "Examination data" panel on the right shows various images and files related to the examination, including barcode analysis results.

Barcode reading



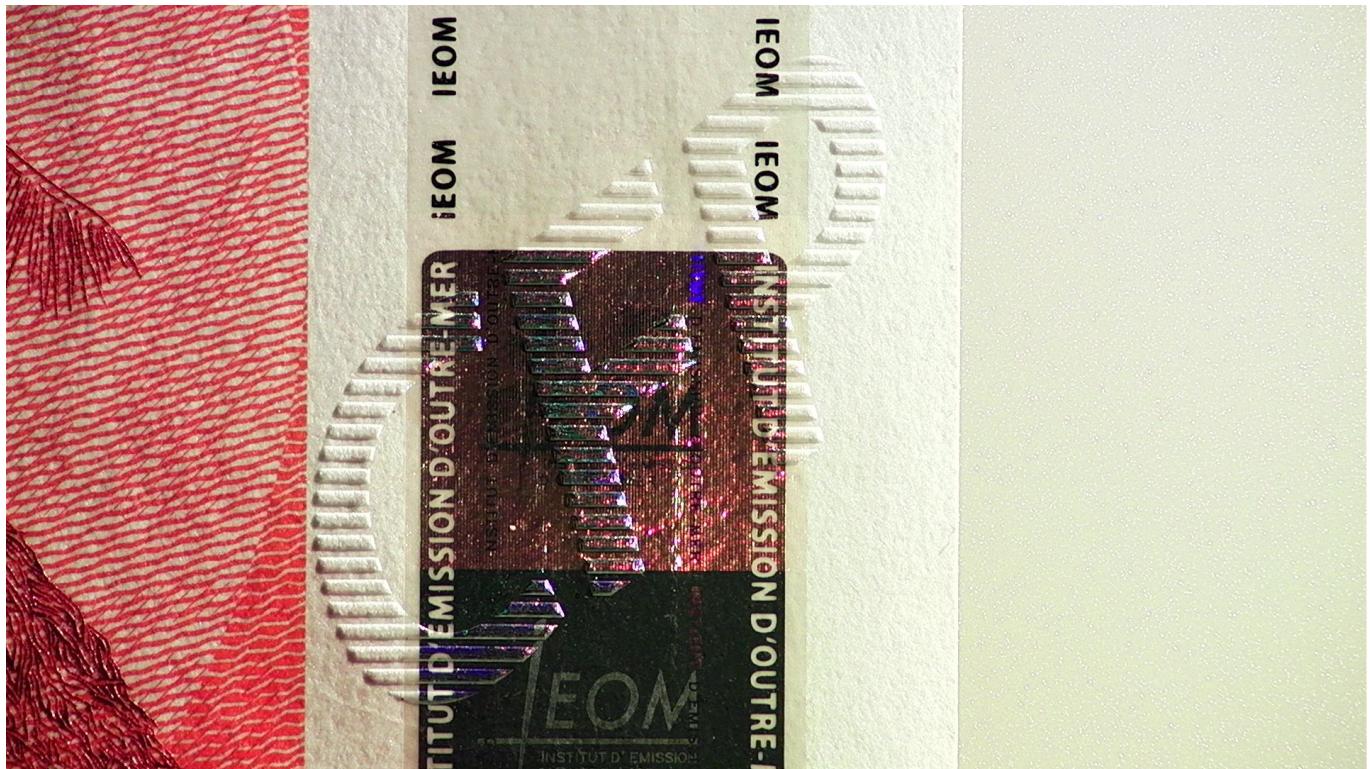
Incident white light 1x



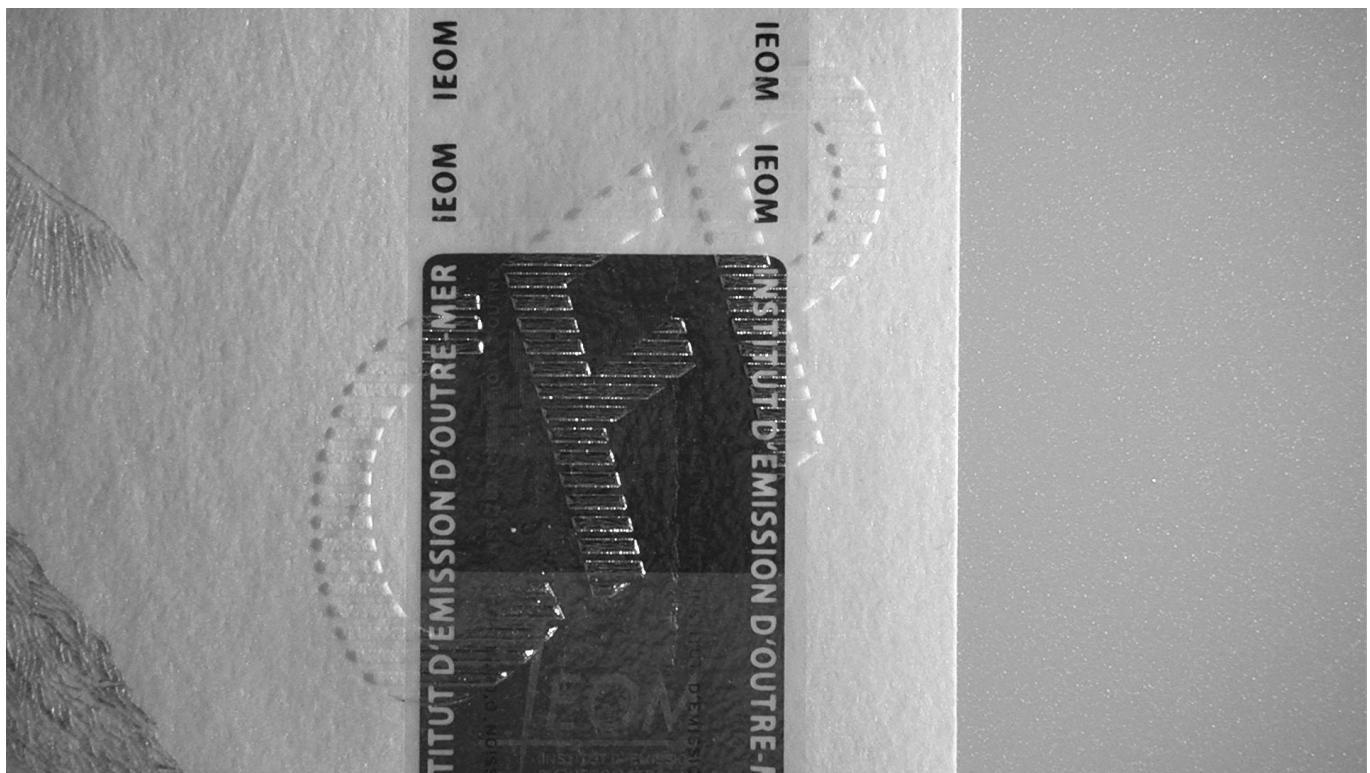
Incident white light 5x



Incident white light 19x



Oblique white light 6x



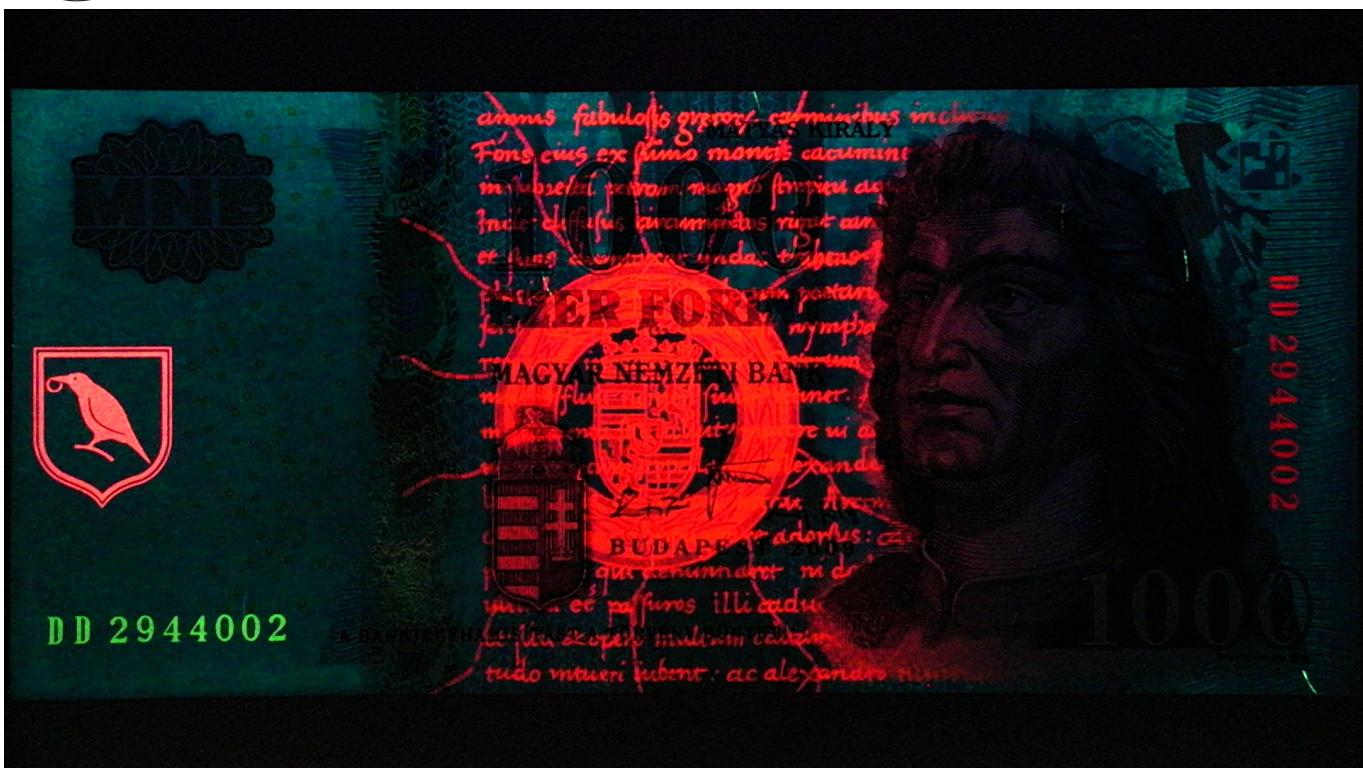
Oblique IR light 6x



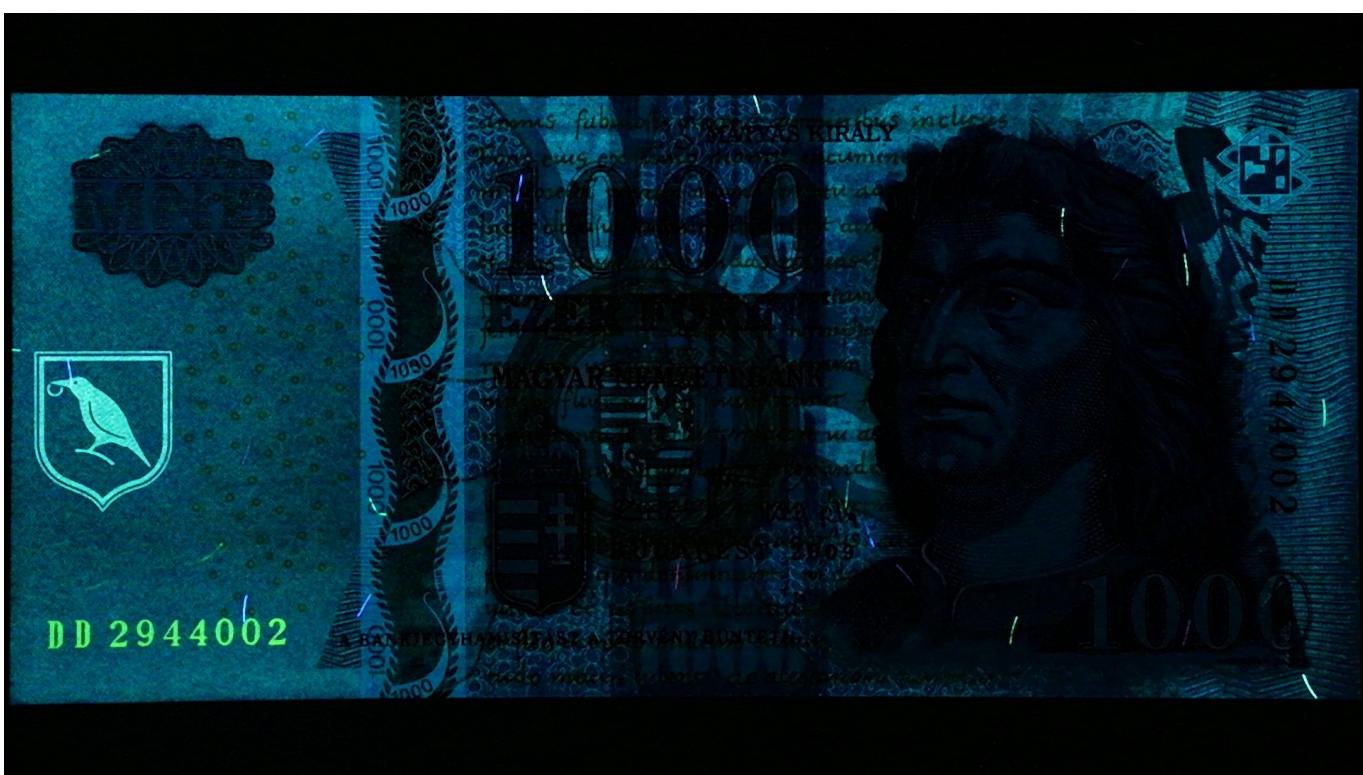
Incident IR light 700 nm 1.1x



Incident IR light 870 nm 1.1x



UV light 254 nm 1.3x



UV light 365 nm 1.3x



UV light 400 nm 1.3x



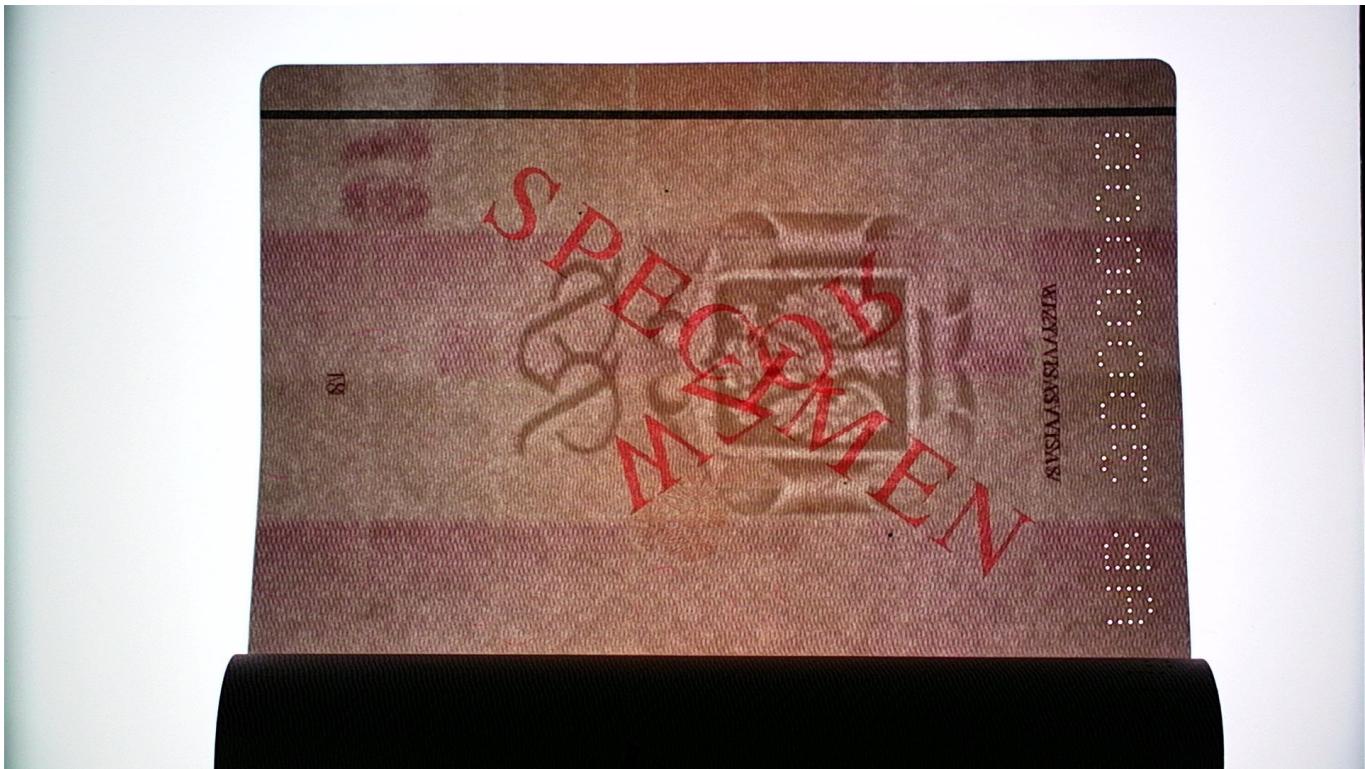
High-intensity incident azure light 1.4x



High-intensity incident green light 1.4x



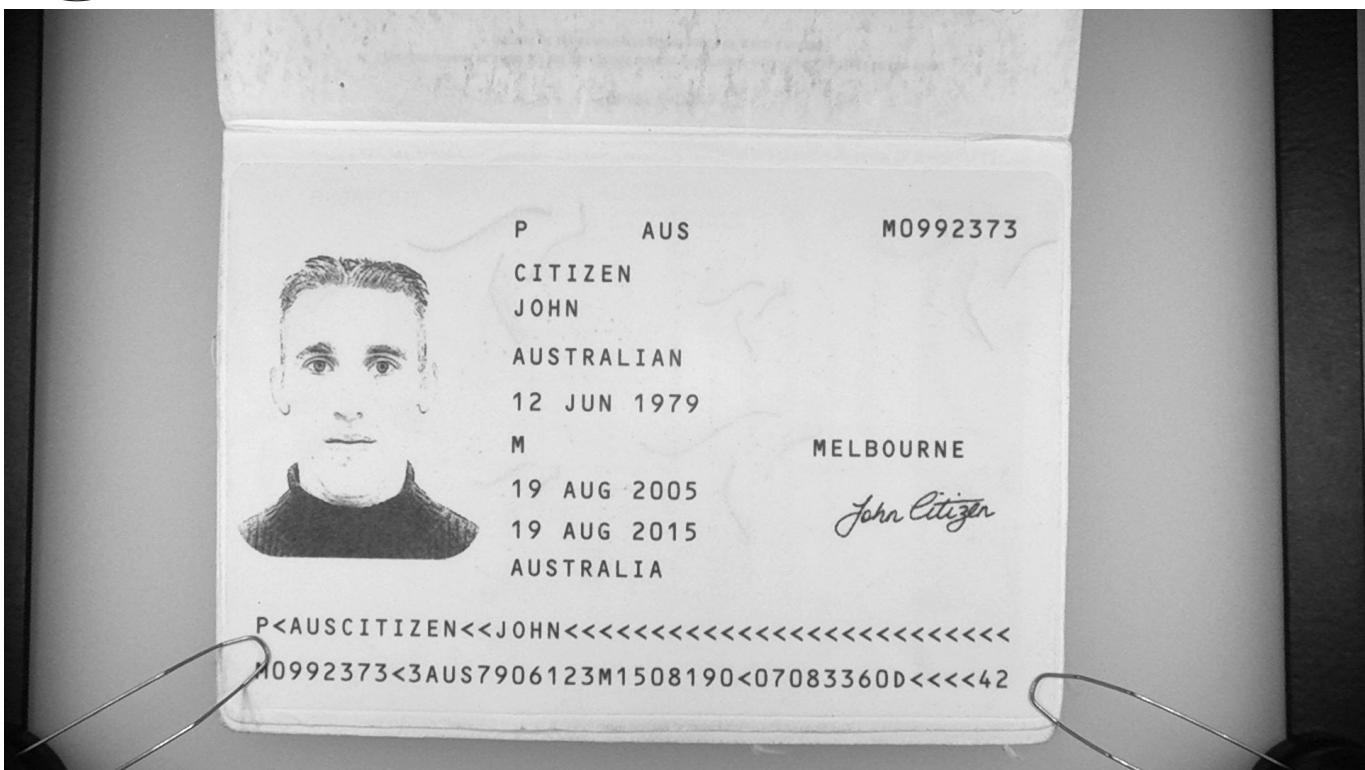
Incident white light 1.1x



Bottom white light 1.1x



Bottom IR light 1.1x



Incident IR light 870 nm 1x



Coaxial white light 1x