AUTOMATIC BOOK SCANNER

SCANROBOT®

turn the Page

AUTOMATIC BOOK SCANNER
FOR MAXIMUM PRODUCTIVITY

TREVENTUS MECHATRONICS

SYSTEM OVERVIEW

ScanRobot® 2.0 MDS

High quality - Automatic Book Scanner

- Fast - up to 2,500 pages per hour
- Distortion free & gentle scanning (prism technology)
- Unique 60° V-shape book cradle
- Single scan technology (for covers, folded maps, loose pages, ...)
- Self standing unit on wheels for easy relocating
- Ergonomic design

Unique hardware features

Wooden 60° V-shape book cradle
* Adjustable between 60° and 100°
* Minimum load/unload time
* Suitable for valuable old & new books
* Applicable for hard & soft covers

Patented capturing technology
* Unique 60° prism
* One central capturing unit
* Equal and constant focus
* No mechanical shutter

Only one mechanical moving part
* Robust and simple design
* Built for 24h shift operation
* Low maintenace
* Very long life cycle

ADVANTAGES

ScanRobot® 2.0 MDS

YES WE SCAN
WWW.TREVENTUS.COM

Page turning technology

- Most gentle & touch free page turning by air flow
- Automatic (up to 2,500 pph)
- Process monitoring & double sheet control
- Semi-automatic / weightless mode
- No clamps
- No fingers
- No glass plates

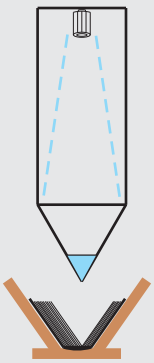
Patented capturing system

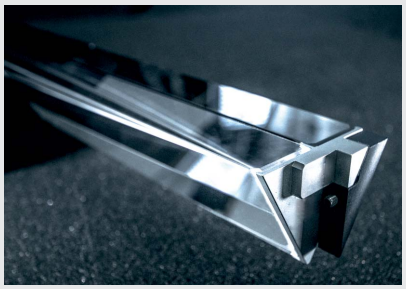
Closed capturing unit (optical 400 dpi)

* Indepenent from ambient light
* Minimum calibration (static white balance)
* Constant distance between object and focal plane

Inside LED illumination

* Perfect homogenous page illumination
* High color reproduction index value (CRI)
* No radiation of heat, infrared or UV light
* Long life cycle LED technology





High quality 60° prism technology

* Distortion free scanning
* Smallest book opening angle - unique 60° V-shape

The ScanRobot® can scan every page with the exact, constant and maximum resolution independent of the book size, thickness and the paper quality.

UNIVERSAL, GENTLE & ROBUST

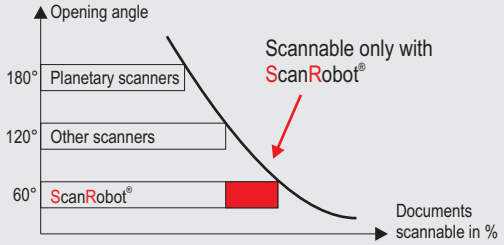
ScanRobot® 2.0 MDS

Universal - suitable for any bound material




Gentle - suitable for historic books (from the 14th century on)

- Book opening angle 60°
- No overstretching of the book binding
- Pressure free scanning
- Touch free page turning by air flow
- LED illumination without any radiation of heat, infrared or UV



Developed for Mass-Digitization

- Robust - Designed for 24/7 shift operation
- Reliable - Only one active moving part
- High quality industrial components (low downtime)
- Very long system life cycle
- Worldwide customer proven

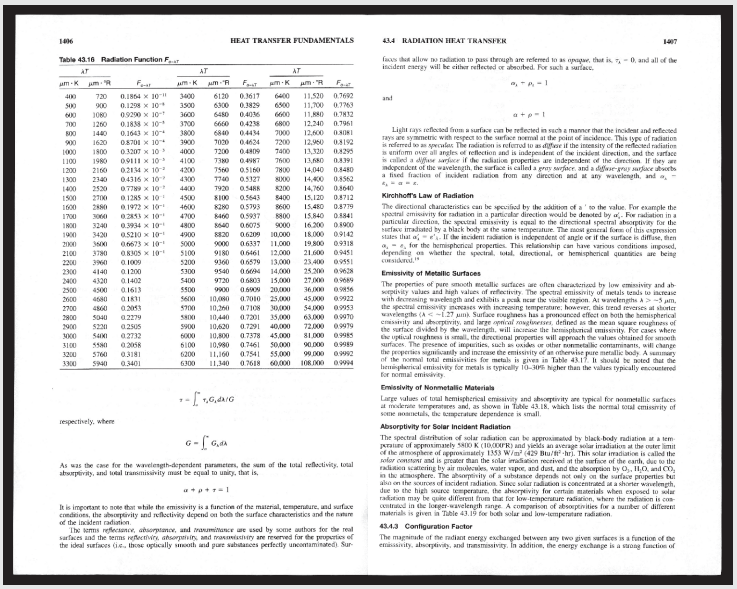
AUSTRIA INDUSTRY AT ITS BEST

TREVENTUS MECHATRONICS

SCAN QUALITY - 1/3

ScanRobot® 2.0 MDS

ScanRobot® - unique 60° scanning



1496 HEAT TRANSFER FUNDAMENTALS

Table 43.16 Radiation Function $F_{\lambda=\lambda T}$

λT			λT			λT		
$\mu m \cdot K$	$\mu m \cdot ^\circ R$	$F_{\lambda=\lambda T}$	$\mu m \cdot K$	$\mu m \cdot ^\circ R$	$F_{\lambda=\lambda T}$	$\mu m \cdot K$	$\mu m \cdot ^\circ R$	$F_{\lambda=\lambda T}$
400	720	0.1864×10^{-11}	3400	6120	0.3617	6400	11,520	0.7692
500	900	0.1298×10^{-8}	3500	6300	0.3829	6500	11,700	0.7763
600	1080	0.9290×10^{-7}	3600	6480	0.4036	6600	11,880	0.7832
700	1260	0.1838×10^{-5}	3700	6660	0.4238	6800	12,240	0.7961
800	1440	0.1643×10^{-4}	3800	6840	0.4434	7000	12,600	0.8081
900	1620	0.8701×10^{-4}	3900	7020	0.4624	7200	12,960	0.8192
1000	1800	0.3207×10^{-3}	4000	7200	0.4809	7400	13,320	0.8295
1100	1980	0.9111×10^{-3}	4100	7380	0.4987	7600	13,680	0.8391
1200	2160	0.2134×10^{-2}	4200	7560	0.5160	7800	14,040	0.8480
1300	2340	0.4316×10^{-2}	4300	7740	0.5327	8000	14,400	0.8562
1400	2520	0.7789×10^{-2}	4400	7920	0.5488	8200	14,760	0.8640
1500	2700	0.1285×10^{-1}	4500	8100	0.5643	8400	15,120	0.8712
1600	2880	0.1972×10^{-1}	4600	8280	0.5793	8600	15,480	0.8779
1700	3060	0.2853×10^{-1}	4700	8460	0.5937	8800	15,840	0.8841
1800	3240	0.3934×10^{-1}	4800	8640	0.6075	9000	16,200	0.8900
1900	3420	0.5203×10^{-1}	4900	8820	0.6209	10,000	18,000	0.9142
2000	3600	0.6673×10^{-1}	5000	9000	0.6337	11,000	19,800	0.9318
2100	3780	0.8305×10^{-1}	5100	9180	0.6461	12,000	21,600	0.9451
2200	3960	0.1005	5200	9360	0.6579	13,000	23,400	0.9551
2300	4140	0.1200	5300	9540	0.6694	14,000	25,200	0.9628
2400	4320	0.1402	5400	9720	0.6803	15,000	27,000	0.9689
2500	4500	0.1613	5500	9900	0.6909	20,000	36,000	0.9858
2600	4680	0.1831	5600	10,080	0.7010	25,000	45,000	0.9922
2700	4860	0.2053	5700	10,260	0.7108	30,000	54,000	0.9953
2800	5040	0.2279	5800	10,440	0.7201	35,000	63,000	0.9970
2900	5220	0.2505	5900	10,620	0.7291	40,000	72,000	0.9979
3000	5400	0.2732	6000	10,800	0.7378	45,000	81,000	0.9985
3100	5580	0.2958	6100	10,980	0.7461	50,000	90,000	0.9989
3200	5760	0.3181	6200	11,160	0.7541	55,000	99,000	0.9992
3300	5940	0.3401	6300	11,340	0.7618	60,000	108,000	0.9994

$$\tau = \int_0^\infty \tau_\lambda G_\lambda d\lambda / G$$

respectively, where

$$G = \int_0^\infty G_\lambda d\lambda$$

As was the case for the wavelength-dependent parameters, the sum of the total reflectivity, total absorptivity, and total transmissivity must be equal to unity, that is,

$$\alpha + \rho + \tau = 1$$

It is important to note that while the emissivity is a function of the material, temperature, and surface conditions, the absorptivity and reflectivity depend on both the surface characteristics and the nature of the incident radiation.

The terms *reflectance*, *absorptance*, and *transmittance* are used by some authors for the real surfaces and the terms *reflectivity*, *absorptivity*, and *transmissivity* are reserved for the properties of the ideal surfaces (i.e., those optically smooth and pure substances perfectly uncontaminated). Surfaces that allow no radiation to pass through are referred to as *opaque*, that is, $\tau_\lambda = 0$, and all of the incident energy will be either reflected or absorbed. For such a surface,

$$\alpha_\lambda + \rho_\lambda = 1$$

and

$$\alpha + \rho = 1$$

Light rays reflected from a surface can be reflected in such a manner that the incident and reflected rays are symmetric with respect to the surface normal at the point of incidence. This type of radiation is referred to as *specular*. The radiation is referred to as *diffuse* if the intensity of the reflected radiation is uniform over all angles of reflection and is independent of the incident direction, and the surface is called a *diffuse surface* if the radiation properties are independent of the direction. If they are independent of the wavelength, the surface is called a *grey surface*, and a *diffuse-grey surface* absorbs a fixed fraction of incident radiation from any direction and at any wavelength, and $\alpha_\lambda = \varepsilon_\lambda = \alpha = \varepsilon$.

Kirchhoff's Law of Radiation

The directional characteristics can be specified by the addition of a ′ to the value. For example the spectral emissivity for radiation in a particular direction would be denoted by α'_λ. For radiation in a particular direction, the spectral emissivity is equal to the directional spectral absorptivity for the surface irradiated by a black body at the same temperature. The most general form of this expression states that $\alpha'_\lambda = \varepsilon'_\lambda$. If the incident radiation is independent of angle or if the surface is diffuse, then $\alpha_\lambda = \varepsilon_\lambda$ for the hemispherical properties. This relationship can have various conditions imposed, depending on whether the spectral, total, directional, or hemispherical quantities are being considered.[13]

Emissivity of Metallic Surfaces

The properties of pure smooth metallic surfaces are often characterized by low emissivity and absorptivity values and high values of reflectivity. The spectral emissivity of metals tends to increase with decreasing wavelength and exhibits a peak near the visible region. At wavelengths $\lambda > \sim 5\ \mu m$, the spectral emissivity increases with increasing temperature; however, this trend reverses at shorter wavelengths ($\lambda < \sim 1.27\ \mu m$). Surface roughness has a pronounced effect on both the hemispherical emissivity and absorptivity, and large *optical roughness*, defined as the mean square roughness of the surface divided by the wavelength, will increase the hemispherical emissivity. For cases where the optical roughness is small, the directional properties will approach the values obtained for smooth surfaces. The presence of impurities, such as oxides or other nonmetallic contaminants, will change the properties significantly and increase the emissivity of an otherwise pure metallic body. A summary of the normal total emissivities for metals is given in Table 43.17. It should be noted that the hemispherical emissivity for metals is typically 10–30% higher than the values typically encountered for normal emissivity.

Emissivity of Nonmetallic Materials

Large values of total hemispherical emissivity and absorptivity are typical for nonmetallic surfaces at moderate temperatures and, as shown in Table 43.18, which lists the normal total emissivity of some nonmetals, the temperature dependence is small.

Absorptivity for Solar Incident Radiation

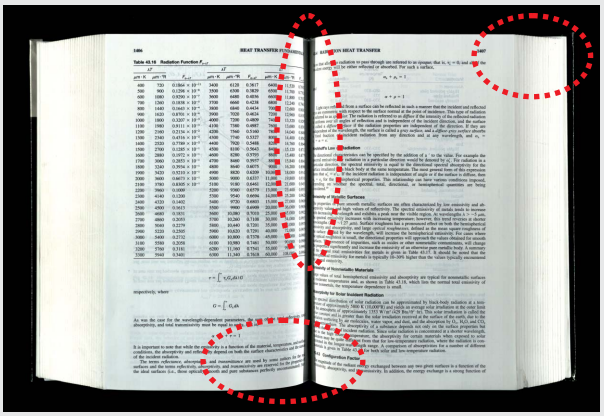
The spectral distribution of solar radiation can be approximated by black-body radiation at a temperature of approximately 5800 K (10,000°R) and yields an average solar irradiation at the outer limit of the atmosphere of approximately 1353 W/m² (429 Btu/ft²·hr). This solar irradiation is called the *solar constant* and is greater than the solar irradiation received at the surface of the earth, due to the radiation scattering by air molecules, water vapor, and dust, and the absorption by O_3, H_2O, and CO_2 in the atmosphere. The absorptivity of a substance depends not only on the surface properties but also on the sources of incident radiation. Since solar radiation is concentrated at a shorter wavelength, due to the high source temperature, the absorptivity for certain materials when exposed to solar radiation may be quite different from that for low-temperature radiation, where the radiation is concentrated in the longer-wavelength range. A comparison of absorptivities for a number of different materials is given in Table 43.19 for both solar and low-temperature radiation.

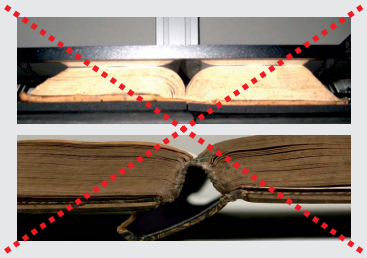
43.4.3 Configuration Factor

The magnitude of the radiant energy exchanged between any two given surfaces is a function of the emissivity, absorptivity, and transmissivity. In addition, the energy exchange is a strong function of

- No distortions
- No curvature
- No waves
- Exact page margin scan
- Perfect illumination

Compared to
Planetary scanners (with 180° opening angle)



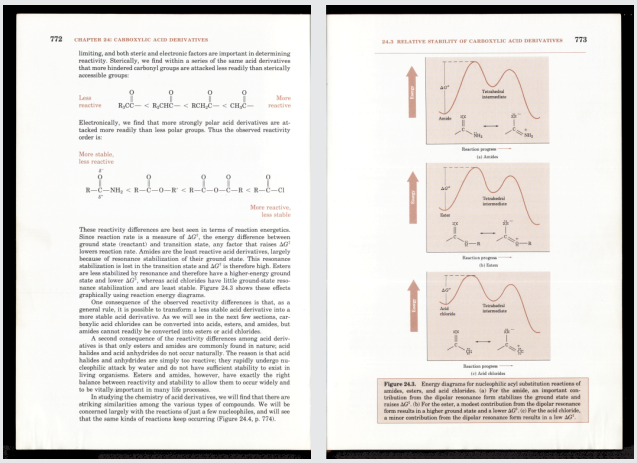


- Distortions
- Curves
- No exact page margin
- Inhomogeneous illumination

SCAN QUALITY - 2/3

ScanRobot® 2.0 MDS

ScanRobot® - prism technology



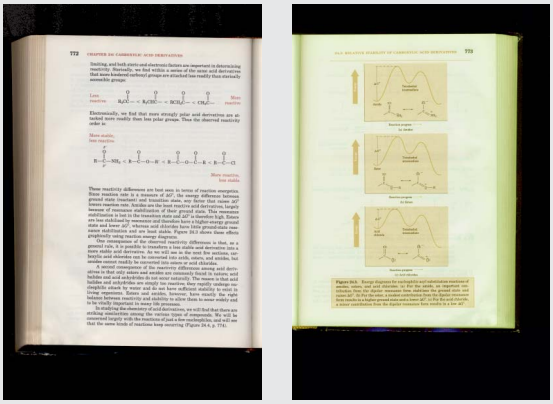
1 capturing unit = 1 scan result

- Exact size & resolution
- Exact colour
- Exact focus & sharpness
- Exact white point

Advantage
No corrections needed!

Compared to

Systems with camera devices



2 cameras* = 2 different scan results

* Effects are amplified for demonstration reasons

- Varying sizes
- Varying resolutions
- Varying colours
- Varying white point

Upcoming challenges

- Resolution correction
- Colour correction
- Focus & sharpness correction

SCAN QUALITY - 3/3

ScanRobot® 2.0 MDS

ScanRobot® - prism technology

- Single page image
- Easy page edge detection
- Easy cropping

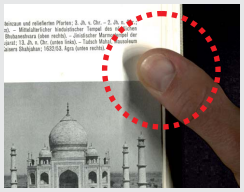
- Artefact free
- No clamps / fingers
- Perfect scan of the page

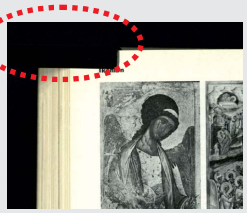
Compared to

Other scanners

Disturbing book block

Image artefacts





- Page edge detecting challenge
- Cropping & deskewing challenge

- Artefacts like clamps or fingers
- Clamp/finger removing challenge

ScanGate® RT - CAPTURING SOFTWARE

Real-Time image processing for ScanRobot® 2.0 MDS

Advantages

AUTOMATION IN REAL-TIME

- Capturing & image processing in real-time
- Automated creation of best practice outputs for
- Archiving, Presentation and Reprint
- Live view of processed images
- Efficient job management

Specifications

Professional real-time image capturing & processing
The ScanGate® RT software enables real-time image processing during the scanning process.
Ready-to-use output is created in one single and automated step without loss of speed.

Pre-defined output options
Best practice outputs for Archiving, Presentation and Reprint are included (details see next page).

Live view of scanned & processed images
The fast live view of the scanned & processed images with the pre-defined output options allows real-time quality control.

Efficient job management
The profile administration allows to store settings as basis for new jobs. This ensures e.g. fast book changeovers and to process repetitive jobs (similar books) highly efficiently.

Powerful recognition & evaluation functions
Automatic border & page color recognition, text base line detection, border evaluation (e.g. page size, margins etc.)

Real-time image processing tools
Deskewing, cropping, rotation, extrapolation, ICC profile rendering, background homogenization / normalization, achromatism reducing, binarization (dynamic threshold), brightness / contrast adaption, unsharp masking, image scaling

High quality color management - According to ICC profile standards.

Dublin Core metadata interface - For the creation of fixed metadata xml-files based on the Dublin Core standard.

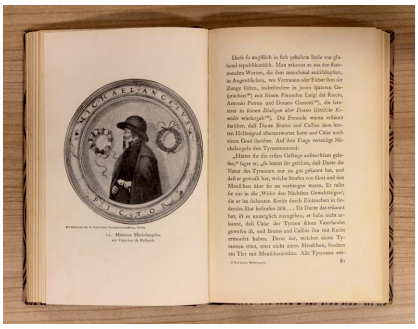
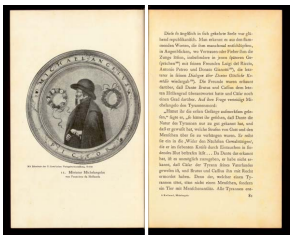
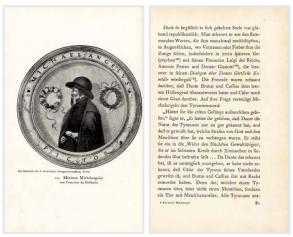
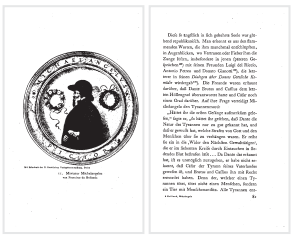
Multi language user interface - Software available in over 15 languages.

External interface - Intuitive interface for the included flatbed scanner (e.g. for scanning of folded maps, covers, etc.).

Flexible storage in multiple file formats - JPEG, JPG2000*, TIFF, TIFF G4, PNG, GIF, BMP, PDF*, PDF/a*
* Formats may be generated within a separate process.

REAL-TIME OUTPUT OPTIONS

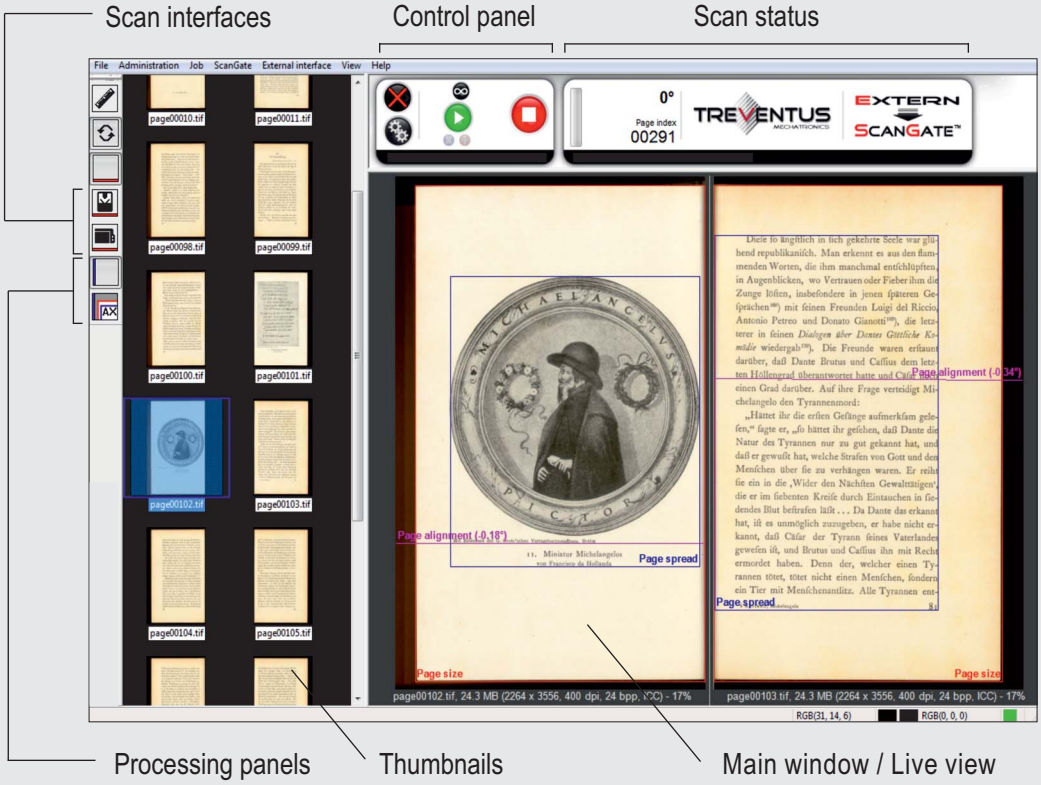
ScanRobot® 2.0 MDS (with ScanGate® RT)

Original			
Option	**ARCHIVING**	**PRESENTATION**	**REPRINT**
Output			
Goal	As close to the original as possible (facsimile)	Good looking images for presentation	Optimal quality for printer
Use cases	• Digital heritage • Digital master files	• Digital library • Web (downloadable content)	• Print on demand • Reprint of books
Guidelines (applied real-time functions)	• No image processing allowed (except rotation by multiples of 90° and cropping) • Uncompressed file storage (except lossless compression)	• Good contrast & readability • Background homogenization • Deskewed & cropped (only page should be visible but no outside margins) • Rather small file size for easy access and handling (e.g. via internet)	• White background with black text • Binarized • Despeckled • Deskewed & cropped (no borders visible)
Specifications			
Resolution	300 / 400 DPI	300 / 400 DPI	300 / 400 DPI
Color depth	24 bit (color with ICC profile)	24 bit or 8 bit (color or grayscale)	1 bit (black and white)
Output format	TIFF	JPEG (optional: PDF)	TIFF (optional: PDF)
Compression	None	JPEG (lossy)	CCITT4 (lossless)
File size (one page)	Large 300 DPI, A4: ca. 26 MB 400 DPI, A4: ca. 46 MB	Small 300 DPI, A4: ca. 1,5 MB 400 DPI, A4: ca. 2,5 MB	Very small 300 DPI, A4: ca. 0,2 MB 400 DPI, A4: ca. 0,5 MB

ScanGate® RT - CAPTURING SOFTWARE

User interface & Software add-ons

Graphical user interface (GUI available in over 15 languages)



Software add-ons* for ScanGate® RT (optionally available)

OCR Enterprise solution™ - UNLIMITED
Text recognition software for automated processing of OCR-jobs for over 130 languages.

RT-Batch workflows for Automated Batch Processing™
Individual solutions for automated (overnight) batch processing of a customized set of functions.

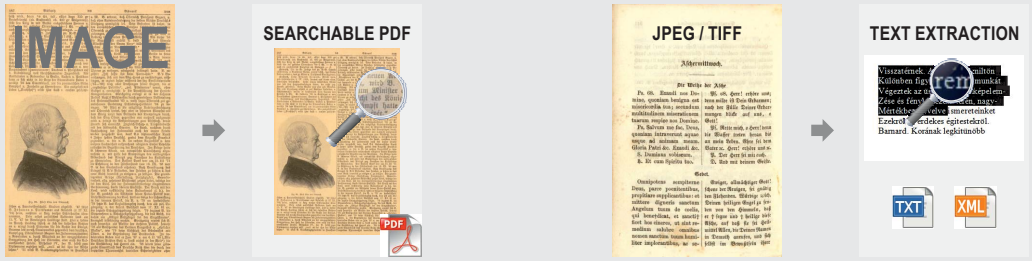
Advanced image processing tools package
E.g. color replacing, blurring, tiff tag changing, etc.

* For details see next pages.

ScanGate® RT - SOFTWARE ADD-ONS

OCR Enterprise solution™ - UNLIMITED
(optionally available)

Automated text recognition



OcrSolutions™

Functions / Features	OCR Enterprise solution™ - UNLIMITED
OCR page contingent	
Unlimited (no page limitation)	●
Customization options / Flexibility	
Pre-configured OCR workflows (workflows are fixed / hard-coded; OCR languages can be set)	●
Performance	
Batch processing of multiple OCR-jobs	●
Output formats (by default / standard)	
PDF (PDF/a, multi- and single pages)	●
TXT (multi- and single page)	●
XML (hOCR, single pages only)	●
OCR languages	
Over 130 available languages (excerpt: Afrikaans, Azerbaijani, Bengali, Bulgarian, Catalan, Czech, Cyrillic, Danish, German, Greek, English, Esperanto, Estonian, Persian, Finnish, French, Hebrew, Croatian, Hungarian, Italian, Georgian, Latin, Latvian, Lithuanian, Nepali, Norwegian, Polish, Portuguese, Romanian, Russian, Slovak, Slovenian, Spanish, Swedish, Thai, Tibetan, Turkish, Ukrainian, etc.)	●
Gothic font (Fraktur) / Korean / Chinese / Arabic / Vietnamese	●

ScanGate® RT - SOFTWARE ADD-ONS

RT-Batch workflows for Automated Batch Processing™
(optionally available)

Advantages & Benefits

The customized RT-Batch workflows enable automated batch processing* in scan-free periods (e.g. overnight, weekends, longer scanning breaks etc.). Within this a customized set of system functions like creating another output format, copying files to e.g. another storage place, executing of additional image processing functions etc. will be processed fully automated (e.g. overnight).

Automatic execution of several tasks in the batch-processing

Tasks can be combined (according to the individual customer request) to a batch, which is executed sequentially and automatically until the last task.

#	Task
01	SCANNING - RT Output: Archiving (master tiffs, color, 400 dpi)
02	PAGE ORDER - Rename pages
03	IMAGE TREATMENT - Crop pages (smaller than page size)
04	IMAGE TREATMENT - Unsharp masking
05	FORMATS - Create Jpegs (greyscale. 300 dpi)
06	FORMATS - Create multipage PDF (bitonal, 600 dpi)
07	OUTPUT - Copy Jpegs to destination
08	OUTPUT - Upload PDF via FTP
09	ARCHIVE - Clean job and compress master tiffs (LZW)
10	ARCHIVE - Create backup copy of the job
11	CLEANUP - Delete job after 10 days

- Scanning of the images in the format ”RT Output: Archiving”
- Rename all pages systematically
- Execute time consuming image treatment functions
- Create different output formats
- Copy the created output safely to its destination
- Reduce data size to a minimum for a backup copy
- Empty the disk space after a certain period

Queuing of several jobs for the batch-processing

During the day the jobs* are pushed to the batch-processing queue, which is executed e.g. overnight.

#	Job name	Pages	Task	Workflow name	Priority	Progress
1	Job_05	250	PAGE ORDER - Rename pages	BatchProcessingWorkflow_01	very high	
2	Job_01	100	FORMATS - Create Jpegs (greyscale. 300 dpi)	BatchProcessingWorkflow_01		
3	Job_03	150	ARCHIVE - Clean job and compress master tiffs (LZW)	BatchProcessingWorkflow_03		
4	Job_04	400	OUTPUT - Copy Jpegs to destination	BatchProcessingWorkflow_01		
5	Job_02	200	CLEANUP - Delete job after 10 days	BatchProcessingWorkflow_02	-1	

* Jobs can have different tasks, processing stages, priorities, batch-processing-workflows etc.

ScanGate® RT - SOFTWARE ADD-ONS

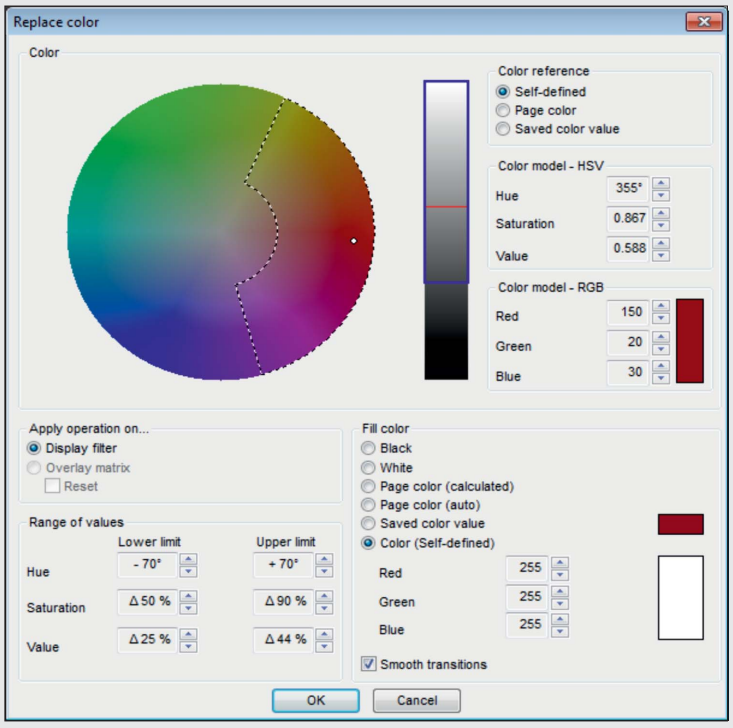
Advanced image processing tools
(optionally available)

Included advanced features

- Color depth conversion, color replacing, background removing
- Moiré effect removing, blurring, black margin coloring
- Image file resolution setting, Tiff tag changing, watermark / ruler / trim mark adding
- Split line detection, page splitting / combination / zip merge & unzip merge
- Grouping of pages (group naming), page renaming

Example: Color replacing

This function enables you to replace a color by another one.



Original

Red rectangles removed

Blue pen removed

SPECIFICATIONS & SCOPE OF DELIVERY

ScanRobot® 2.0 MDS

Technical specifications

• **Speed**	up to 2,500 pages/hour* (automatic mode)
• **Page turning**	automatic with process monitoring (incl. double sheet control), semi-automatic / weightless mode and single scan technology
• **Opening angle** (book cradle)	60 degrees (steplessly adjustable between 60 and 100 degrees)
• **Illumination**	user- and book-friendly LED illumination (without any exposure to heat, IR or UV)
• **Resolution**	400 dpi (optical) with constant resolution independent of the page format
• **Colour depth**	36-bit
• **Image types**	colour, greyscale, b&w
• **Page format** (scanning area)	minimum (2 times - automatic mode): 5 x 5 cm (1.97 x 1.97 in) maximum (2 times - automatic mode): 32 x 32 cm (12.6 x 12.6 in) single scan area: 30 x 43.2 cm (11.8 x 17 in)
• **Book size** (maximum)	35.5 x 34.0 cm (13.98 x 13.39 in)
• **Book thickness**	up to 15 cm (5.91 in)
• **Paper thickness**	no restrictions (recommended spectrum: 40 g/m² to 260 g/m²)
• **Paper quality**	all pages, also acid damaged and wavy pages
• **Covers**	all covers (soft and rigid)
• **Book age**	14th century up to now
• **Storage formats**	jpg, jpg2000, tiff, tiff G4, png, gif, bmp, pdf
• **Dimensions**	l/w/h (without monitor): 0,78 x 0,78 x 1,90 m (30.7 x 30.7 x 74.8 in)
• **Weight**	260 kg (573 lbs)

* The speed can vary depending on paper quality, book size and the general book condition.

Scope of delivery

- 1 pc Automatic book scanner ScanRobot® 2.0 (400 dpi optical)
- 1 pc Single-scan book scanner (flatbed A3)
- 1 pc Control Computer System (high-end PC-workstation)
- 1 pc EIZO 23“ widescreen monitor (colour calibrated)
- 1 pc Integrated holder for monitor, keyboard and mouse
- 1 pc Capturing software with real-time processing - ScanGate® RT

Add-ons (optionally available): OCR Enterprise solution™ - UNLIMITED (text recognition)
RT-Batch workflows for Automated Batch Processing™
Advanced image processing tools package

ScanRobot® 2.0 MDS

MASS DIGITIZATION SYSTEM

World Wide References

National University, AUSTRALIA
University of Queensland, AUSTRALIA
Federal Office of Metrology and Surveying, AUSTRIA
National Library, AUSTRIA
University of Graz Library, AUSTRIA
University Library of Liege, BELGIUM
Brazilian Institute of Agronomic Research, BRAZIL
University of Prince Edward Island, CANADA
National Archive, COLOMBIA
National Library, CZECH REPUBLIC
University of Jyväskylä, FINLAND
Bavarian State Library, GERMANY
State Library of Berlin, GERMANY
University Library Regensburg, GERMANY
NUEPA National University, INDIA
Trinity College Library, IRELAND
Meteo Operation Center, JAPAN
Nazarbaev University, KAZAKHSTAN
National Library, KUWAIT
National Library, LATVIA
University, LUXEMBOURG
Universidad Autonoma Metropilitana, MEXICO
National Library, MONGOLIA
GMS Service Provider, NETHERLANDS
National Library, NORWAY
National Library, POLAND
Siberian Federal University, RUSSIA
Moscow State University, RUSSIA
National Library, RUSSIA
King Fahd Private Library, SAUDIA ARABIA
National Library, SLOVAKIA
Universidad Complutense de Madrid, SPAIN
National Library, SWEDEN
Stockholm University Library, SWEDEN
Umeå University Library, SWEDEN
ETH Library of Zürich, SWITZERLAND
Ankara Social University, TURKEY
National Library, TURKEY
Ukrainian Institute of Industrial Property, UKRAINE
The Getty Research Institute, UNITED STATES
Utah State University, UNITED STATES
Vietnam National University, VIETNAM

... and many more ...

"The ScanRobot® can scan almost any types of book, binding or paper (e.g. Leather-covered wooden bindings, flexible bindings, cardboard bindings, thick, thin or rigid paper)."

The Bavarian State Library, GERMANY

"Treventus Mechatronics GmbH submitted a tender that offers some very clear advantages. [...] The evaluation group's assessment is that no other supplier can match the tender from Treventus Mechatronics GmbH."

Specialists evaluation committee, SWEDEN

"The unique image-taking and page-turning technique of the ScanRobot® shows its benefits in particular with thick books. [...] the pages can be scanned [...] absolutely distortion-free and without any shadows [...] up to just a few mm into the fold."

Digitization Center Regensburg, GERMANY

Excerpt (*alphabetical order by countries*)

TREVENTUS MECHATRONICS

REFERENCES (excerpt)

Awards of Treventus

Winner of the European ICT Grand Prize

Innovation prize of the Theodor Kery foundation

1st place in Genius Innovation Award

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