Chapter 3

How to use the Windows software SpectroConnect

3.1 Software description

The supplied Windows software TECHKON **SpectroConnect** allows to transfer measurement data to the PC and to make device specific settings via the PC. The measurement values can be displayed on the computer monitor. Color information is displayed, colors can be compared and data can be exported into other software applications, e. g. Microsoft Excel™.

When using **SpectroDens Basic** the device has to be connected via the USB cable to the PC when working with SpectroConnect. When performing a measurement with the device, the value will be displayed immediately on the computer screen.

The models **SpectroDens Advanced** and **Premium** have an internal memory for up to 300 reference values, 3000 sample values and 20 "digital" color books, which can contain up to 25000 color values. When connecting the device to the PC via the USB cable, all stored values will be uploaded to the software and displayed on the computer screen. Of course, the device can be operated as usual when connected to the PC.

The software requires a computer with a free USB port and a completely installed Microsoft Windows 7, 8 or 10 operating system.

3.2 Installation

It is important, to carry out the following steps in the right order, to make sure that the USB device driver will be installed properly.

1. Make sure that the device is **NOT** connected to the PC.
   Insert the SpectroConnect CD into the CD drive of the running computer.
   You will find the CD at the back of this manual.

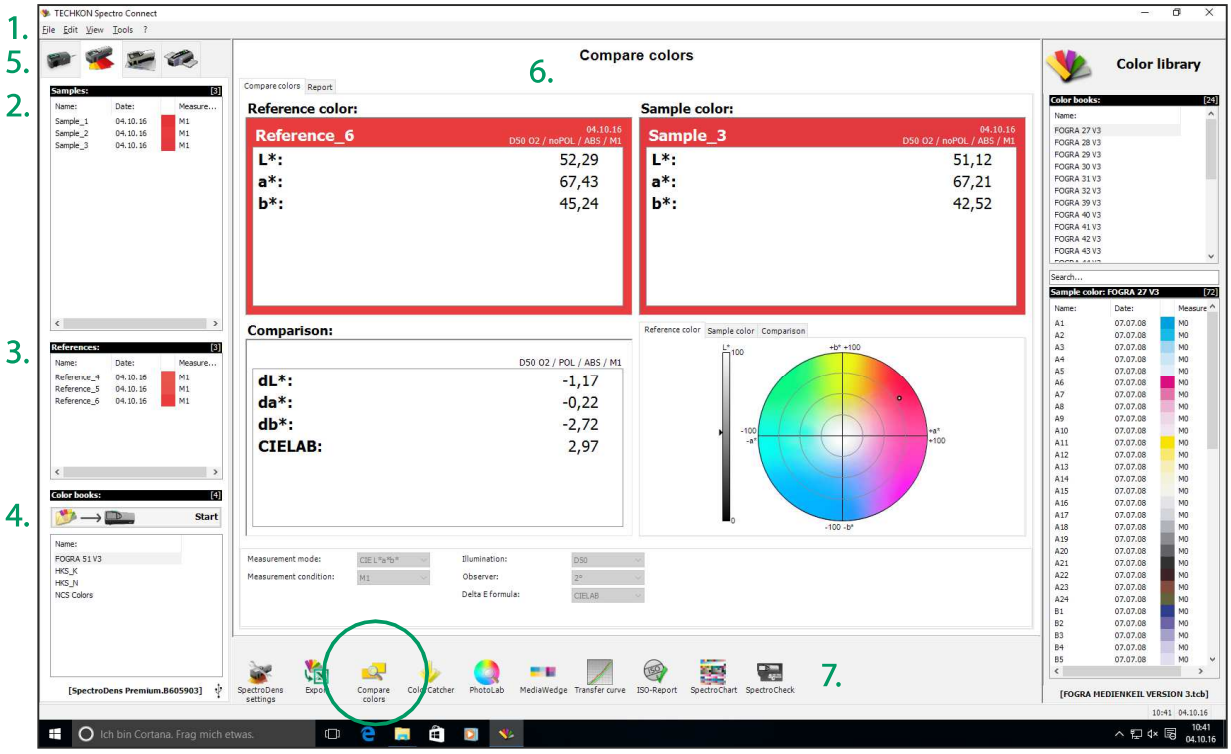
2. The installation routine will start automatically.
   Follow the steps of the installation, until it is completed.

3. Now, after the installation was finished successfully you can connect the device with the Micro-USB cable to the computer.

3.3 Overview / Software module: Compare colors

Software symbol SpectroConnect

The application will be installed in the Windows program files section in the folder **TECHKON GmbH / TECHKON SpectroConnect**. After starting the program the software module **Compare Colors** will appear. Like all the SpectroConnect software modules it is divided into four logical segments: On the left side you see the memory content of the connected device, in the center the active program module, on the right side the color library which is stored on the PC and in the section at the bottom a bar which lists all available and selectable program modules.



1. The menu bar includes functions known from standard Windows applications. They comprise: New, Open, Save, Print and Quit.

2. The window **Samples** shows samples which are stored in the device. Only in SpectroDens Advanced and Premium available.

3. The window **References** shows stored references. Only in SpectroDens Advanced and Premium available.

4. The window **Color books** displays the color books which are stored in the color library of the device. Per Drag and Drop you can copy references and complete color books from here.

5. In this section, the appropriate measurement device can be selected.

6. Window of the active program module

7. This bar shows the list of available program modules. They can be selected from this bar directly via mouse click and the application will appear in the middle of the display.

After launching SpectroConnect it is pre-set to display the module **Compare colors**.

3.4 Software module: SpectroDens settings

In this module device specific settings can be made.

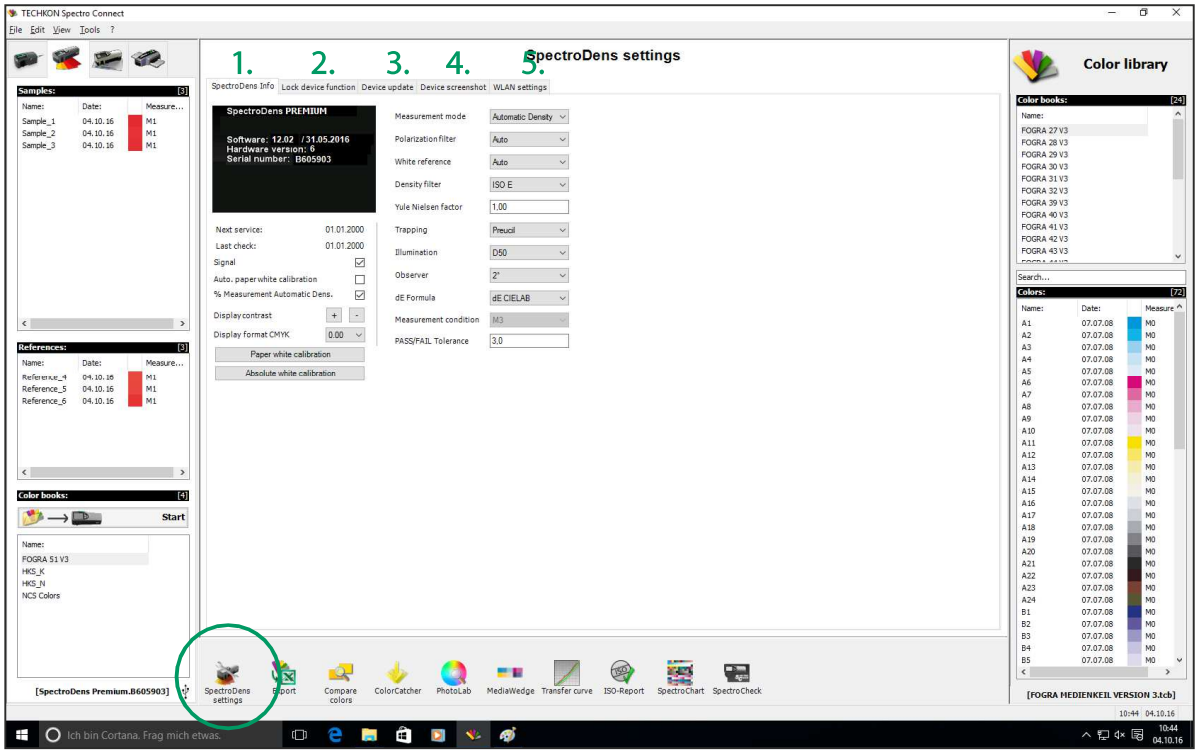
1. **SpectroDens Info:** All settings, which can be made at the device can also be made with this software feature.

2. **Lock device functions:** Device functions can be locked and unlocked with this feature. Locked functions will appear in shaded gray on the LCD display.

3. **Device update:** New device software can be uploaded into the device. There are two different types of files to upload:
   - Device update: loads the new version of device software
   - Device upgrade: upgrades to SpectroDens Advanced or Premium (must be purchased)

4. **Device screenshot:** This shows the device display on the computer screen. All measurement buttons can be remotely operated by the mouse pointer. The screenshot can be saved. This is a very useful feature for product trainings.

5. **WLAN settings:** Window for the configuration of the WLAN connection (see p. 22 ff.)

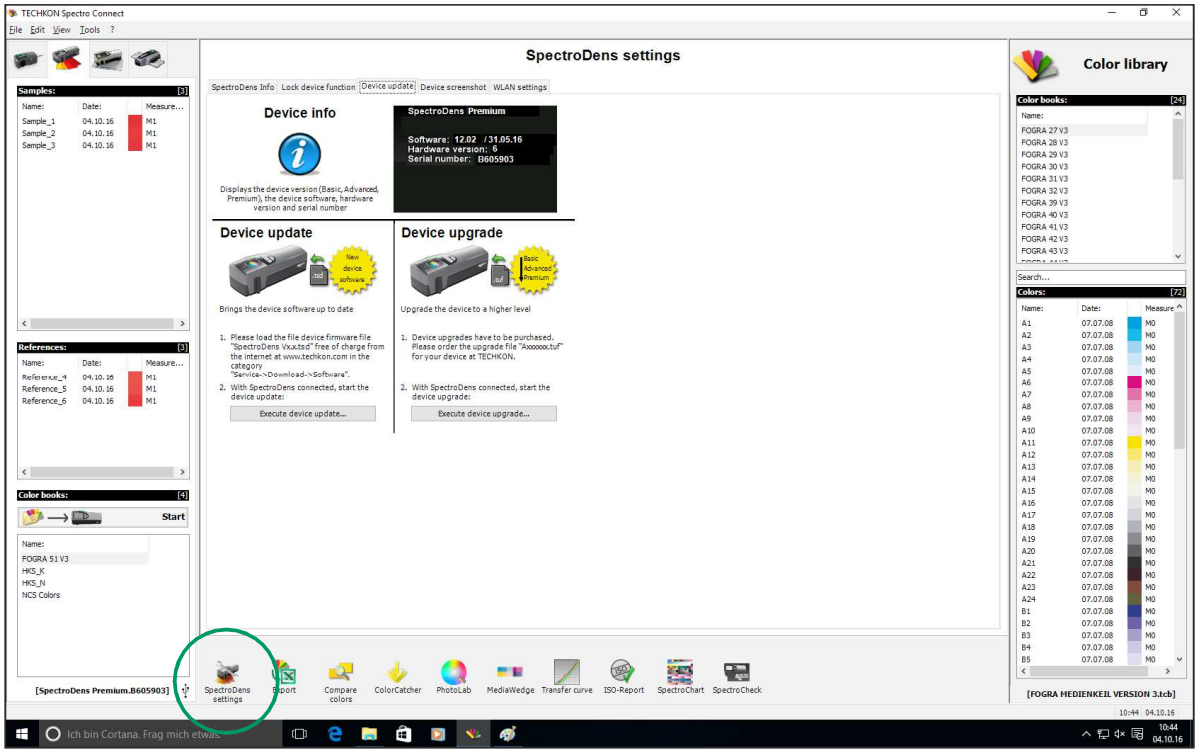


3.5 Device update and device upgrade

By the application of this module SpectroDens can be loaded with a new internal firmware which is selected by **Device update** or SpectroDens can be expanded in functionality by **Device upgrade**.

The SpectroDens **Basic** model can be extended via data upload to **Advanced**- or **Premium**- functionality without the need to send the instrument to the TECHKON service center. Of course, the same procedure applies for upgrades from **Advanced** to **Premium**.

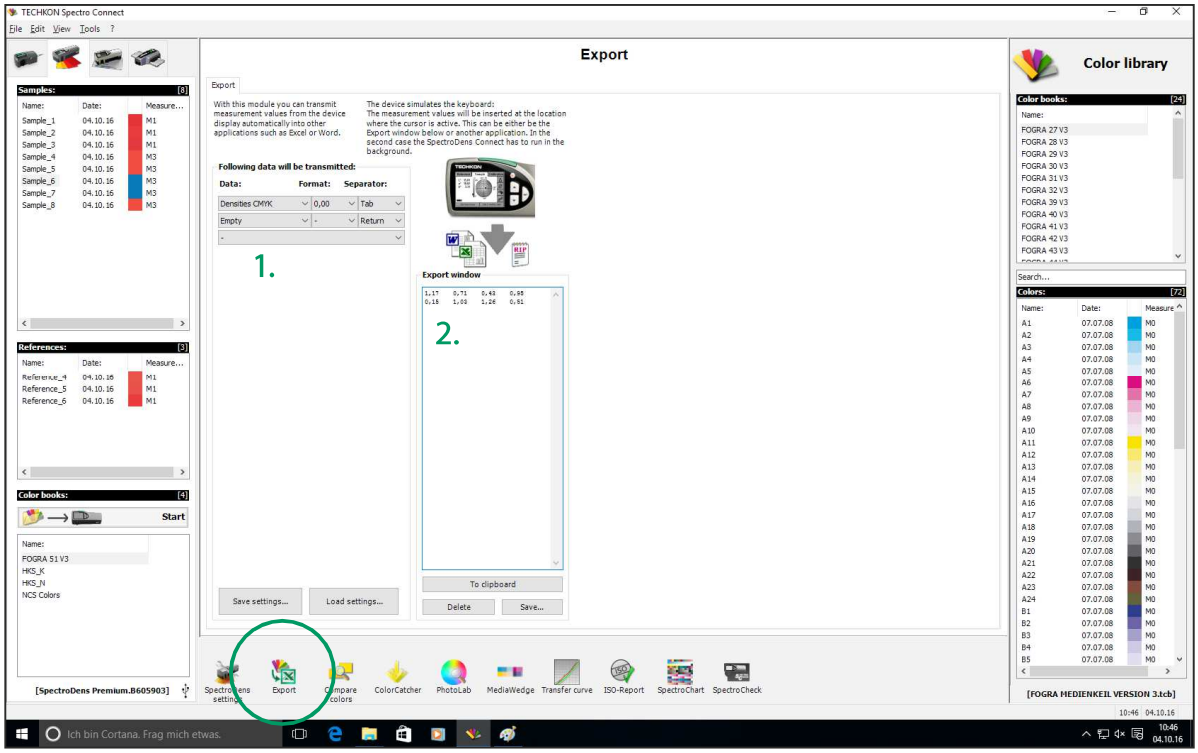
The procedure is explained in the program window:



3.6 Software module: Export

Measurement data can be exported in any other Windows application e.g. Microsoft Excel™, Word™ or other programs which can handle color data, e.g. a RIP calibration software.

SpectroDens works like the keyboard: Pressing the measurement button will place the measurement value automatically at the location where the cursor is.



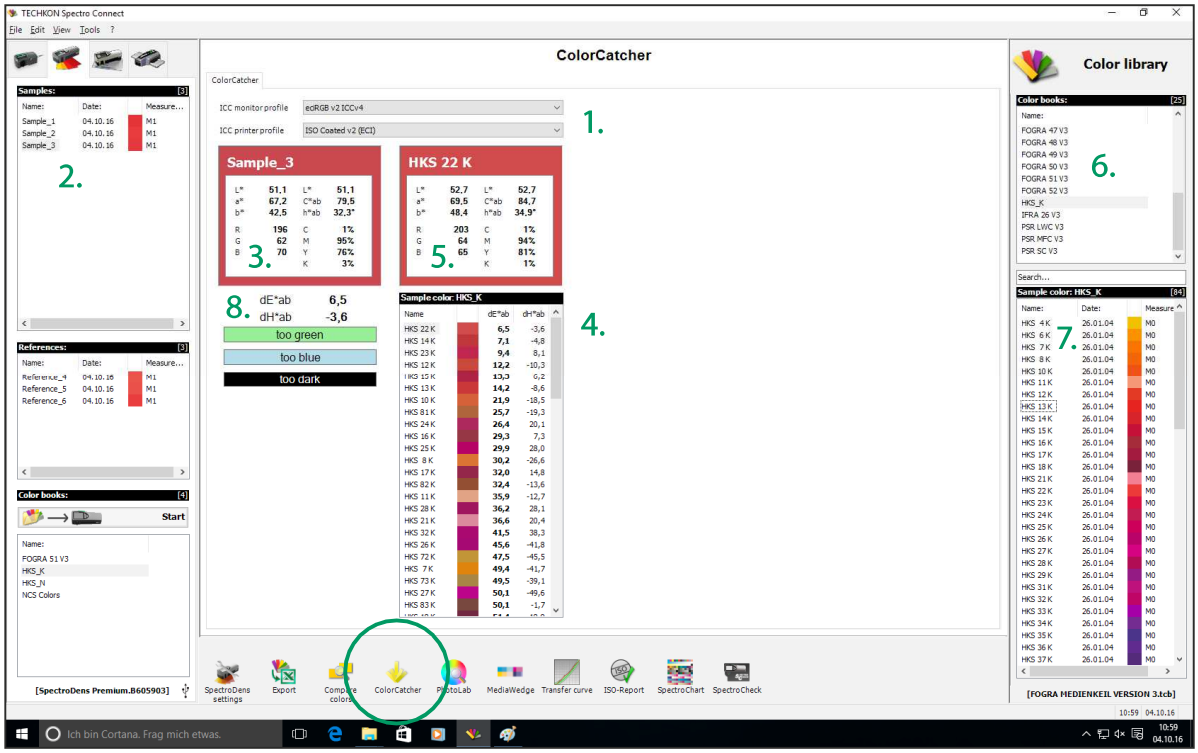
1. Here is defined, which data will be transmitted, how it will be formatted and what type of spacing between the measurement data will be. All the settings can be saved and recalled later.

2. The Export window can also be used for testing data transmissions.

This example shows the transfer of CMYK density values.

3.7 Software module: ColorCatcher

The program module **ColorCatcher** is available in the models SpectroDens Advanced and Premium. Based on a L*a*b*-measurement and referring to selected ICC profiles this program module displays the conversion into the color models L*C*h*, RGB and CMYK. Furthermore an automatic search for the closest matching color of a pre-set or self created color book is carried out. The lower part of the module window informs you about the exact color deviations between the sample and the recommended color of the color book.



1. Selected ICC profiles

2. Measured sample color

3. Calculation of L*a*b*-, RGB-, L*C*h*- and CMYK-values based on selected ICC profiles for the current sample.

4. Shows the closest match to the current sample out of the selected color book.

5. Calculation of L*a*b*-, RGB-, L*C*h*- and CMYK-values based on selected ICC profiles.

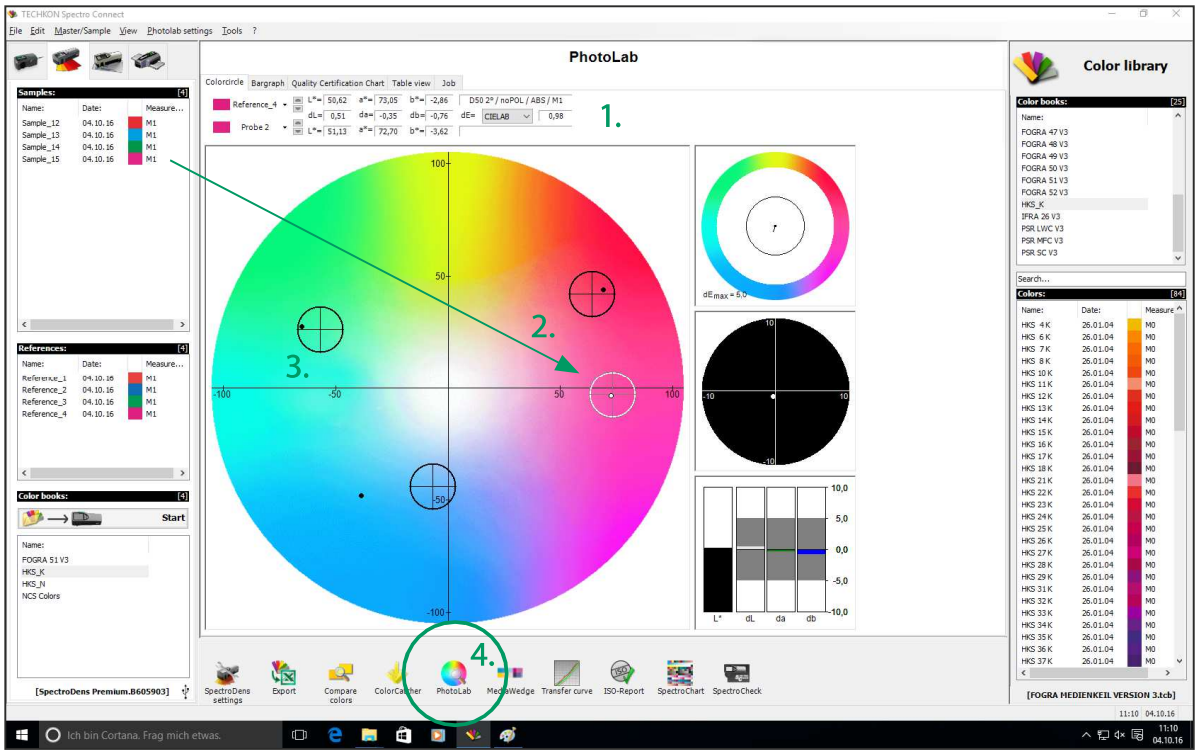
6. Self created color book

7. Colors from a color book

8. Variations and visible differences

3.8 Software module: PhotoLab

TECHKON **PhotoLab** is an optionally available program module for evaluating and displaying L*a*b* color data graphically. Color differences between sample and reference colors can be analyzed. PhotoLab is only available in the SpectroDens Premium version.



1. In the upper section of the module window, the color differences between sample and reference are shown numerically.

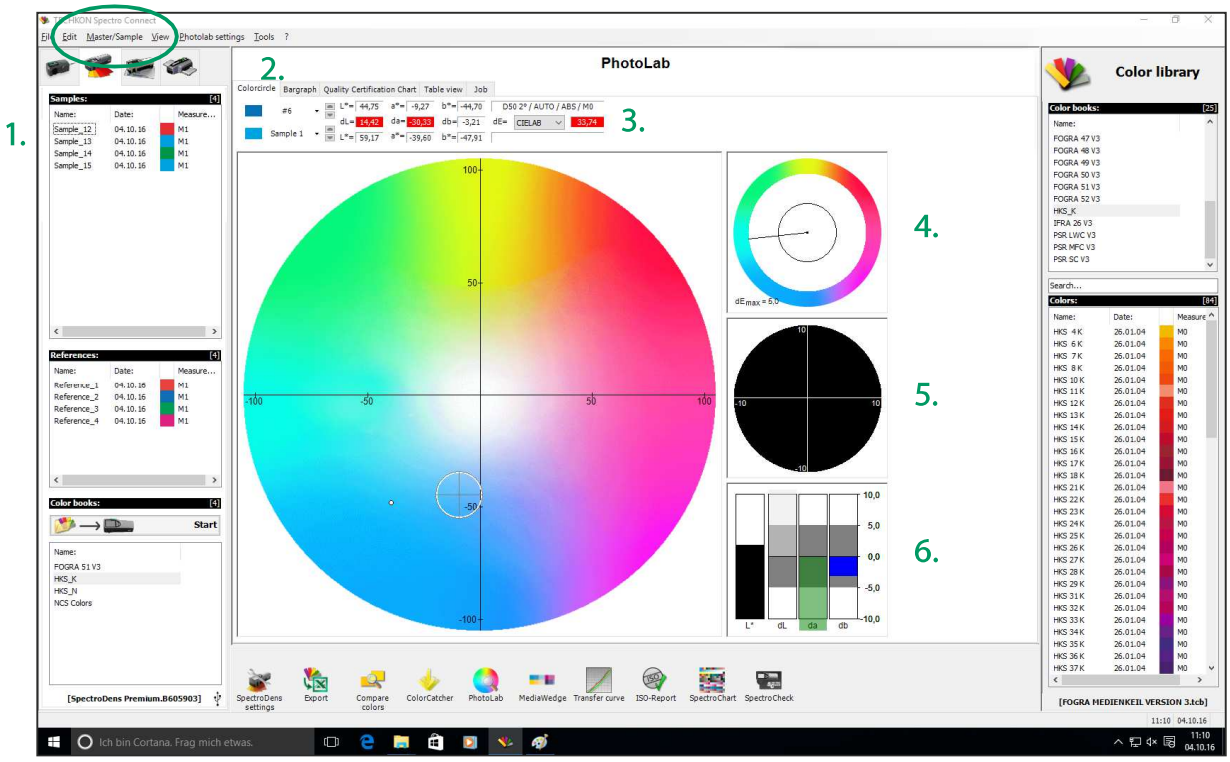
2. Reference: viewfinder with tolerance circle
   Sample: bold point
The current selected value is marked in white.

3. Color samples and references are directly imported into PhotoLab by making measurements with SpectroDens having it connected to the PC via the USB-cable.

Furthermore, color values and complete color books from the device memory or out of the PC color library can be selected and be moved by drag-and-drop with the mouse pointer directly to the center of the display where the L*a*b* color circle is.

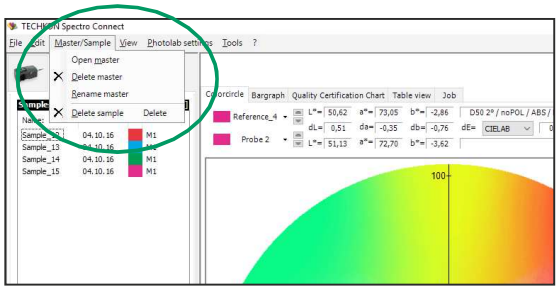
A pop-up window will ask, if the values should be used as sample or as reference values.

4. A mouse click on the program symbol will start the plug-in PhotoLab within the SpectroConnect environment.



1. Samples and references can be selected directly with a mouse click or by choosing from the "pull-down" menu.

Delete and renaming is done via the menu.



2. Different modes of the L*a*b*-display can be selected:

- The modes **Bargraph** and **Quality Certification Chart** show the trend of ΔL*-, Δa*- and Δb*-values of a measurement series.
- The **Table View** shows all values numerically.
- In the **Job** window job relevant text data can be edited.

3. A measurement value highlighted in red indicates an out-of-tolerance sample.

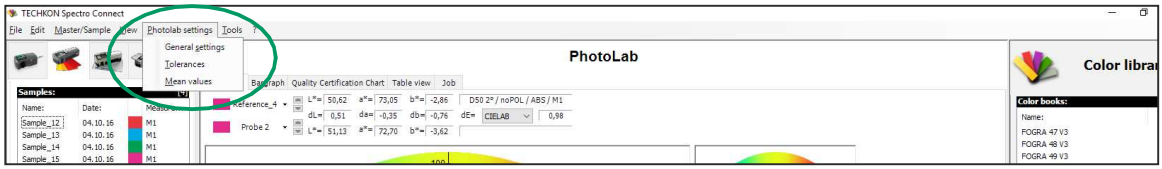
4. The black circle line indicates the tolerance limit of the ΔE*-region. If the black pointer reaches into the outer segment of the circle, the tolerance has been exceeded.

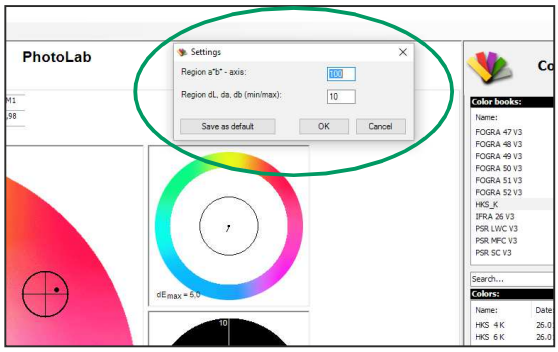
5. Enlarged view of the tolerance circle

6. Display of the color components ΔL*, Δa* and Δb*.

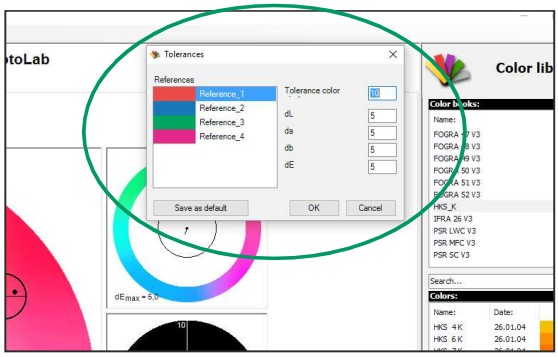
PhotoLab settings

When you open the pop-up window **PhotoLab settings** in the menu bar of the program module PhotoLab, you can select and edit three areas.

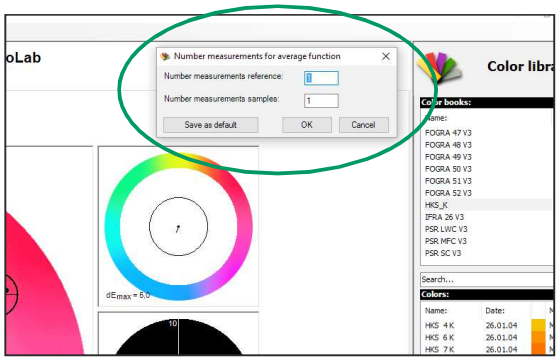




1. General settings:
This is the window for setting the dimensions of the L*a*b* color circle and the ΔL*a*b* color deviation.



2. Tolerances:
In this window the tolerances for the color deviations are defined and the size of the tolerance circle is set.



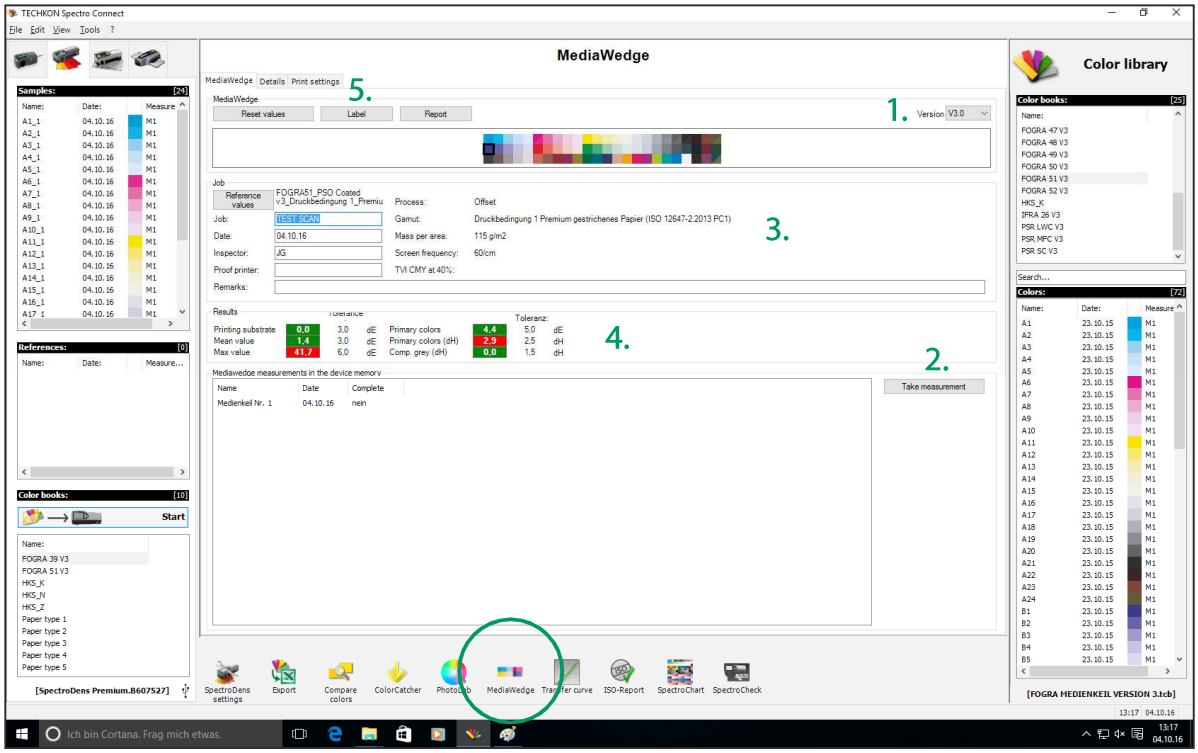
3. Mean values:
It can be appropriate to take several single measurements on one sample which then are averaged to an average value. The number of measurements which result in the calculation of the average value is defined in this window.

3.9 Software module: Media Wedge

The program module **Media Wedge** serves the fast, colorimetric analysis of the Ugra / Fogra Media Wedge. This digital control element is available from Fogra, the German "Graphic Technology Research Association" (www.fogra.org). The test element is placed at the border of a proof. The software evaluates the color quality printed in colorimetric terms.

Color differences between the Fogra target values and the measured samples will be clearly represented in this program module.

The software module **Media Wedge** is only available in the SpectroDens Premium version.



1. Manual selection of the media wedge version. (You will find the version number on the printed test element.) The software supports the Ugra / Fogra Media Wedge in version 3.0 as well.

2. With SpectroDens Premium there is a media wedge feature within the device as well.

Measurements can be made remotely without a connection to the PC. When the device gets connected later, the measured data will be uploaded.

3. Selection of reference values

4. Overview of measurement results

5. A short protocol can be printed with a Dymo label printer on a self-adhesive label which can be stuck on the proof. Alternatively a detailed report of the measurement values can be printed (see p. 88).

Medienkeilauswertung: Etikett und Details

Mediawedge Analysis

Job: TEST SCAN **Inspector:** JG
Date: 04.10.16 **Proof printer:**
Remarks:

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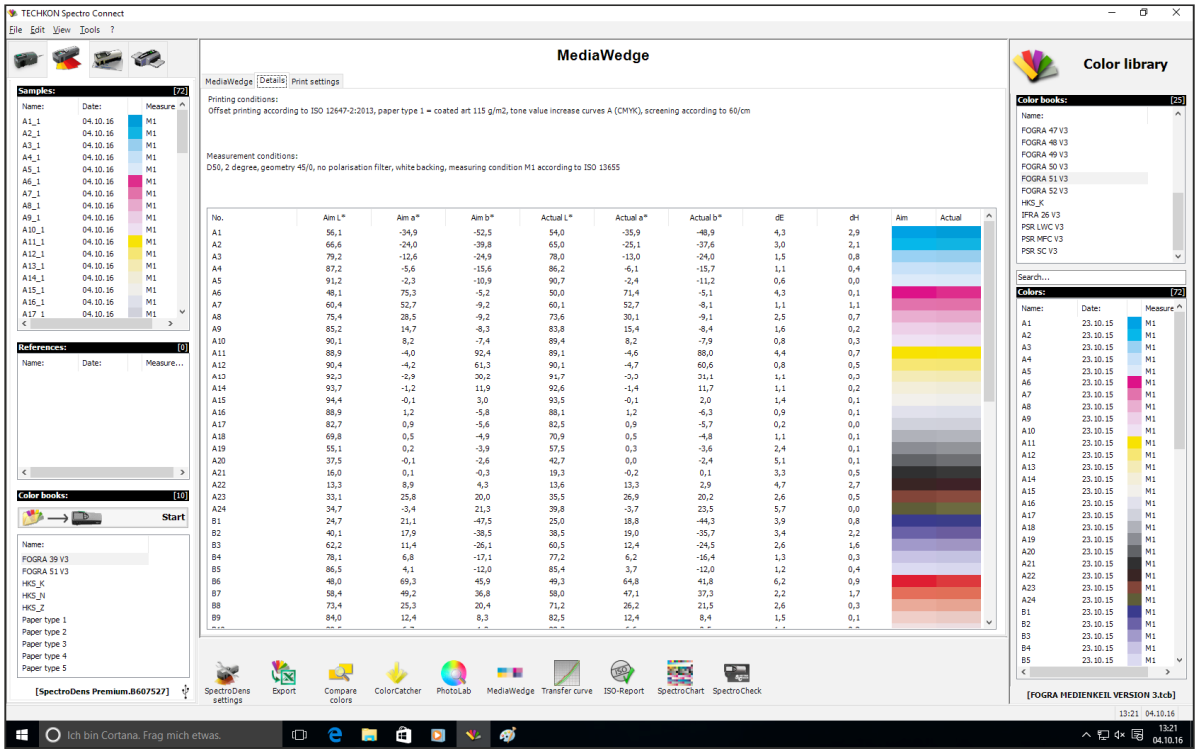
	dE/dH	Max. Tolerance	Remarks	
Print. Substr.:	1,7	3,0	OK	✓
Mean:	2,6	3,0	OK	✓
Max:	6,2	6,0	not OK	✗
Primary colors:	4,4	5,0	OK	✓
Primary col. (dH):	2,9	2,5	not OK	✗
Comp. grey (dH):	0,8	1,5	OK	✓

Printing and measurement conditions:
Offset printing according to ISO 12647-2:2013, paper type 1 = coated art 115 g/m2, tone value increase curves A (CMYK), screening according to 60/cm
D50, 2 degree, geometry 45/0, no polarisation filter, white backing, measuring condition M1 according to ISO 13655

Nach dem Einlesen des Medienkeils wird ein kurzes Protokoll erstellt, das mit einem Dymo-Etikettendrucker auf einem selbstklebenden Etikett ausgedruckt werden kann.

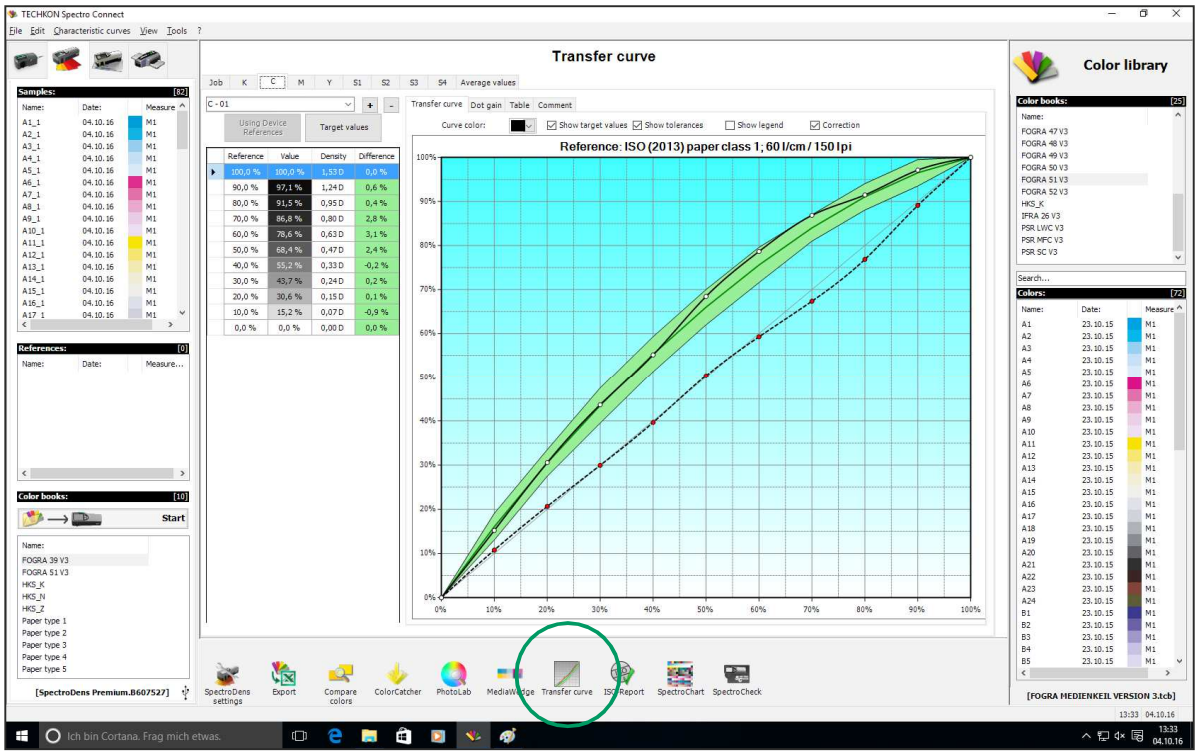


Der Ugra/Fogra-Medienkeil in der Version 3.0 wird von der Softeware SpectroConnect unterstützt. Die Abbildung zeigt den Bereich **Details**.

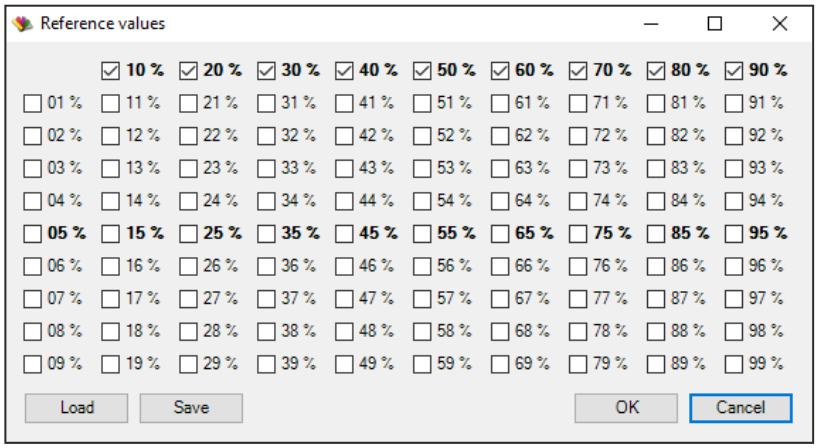
3.10 Software module: Transfer curve

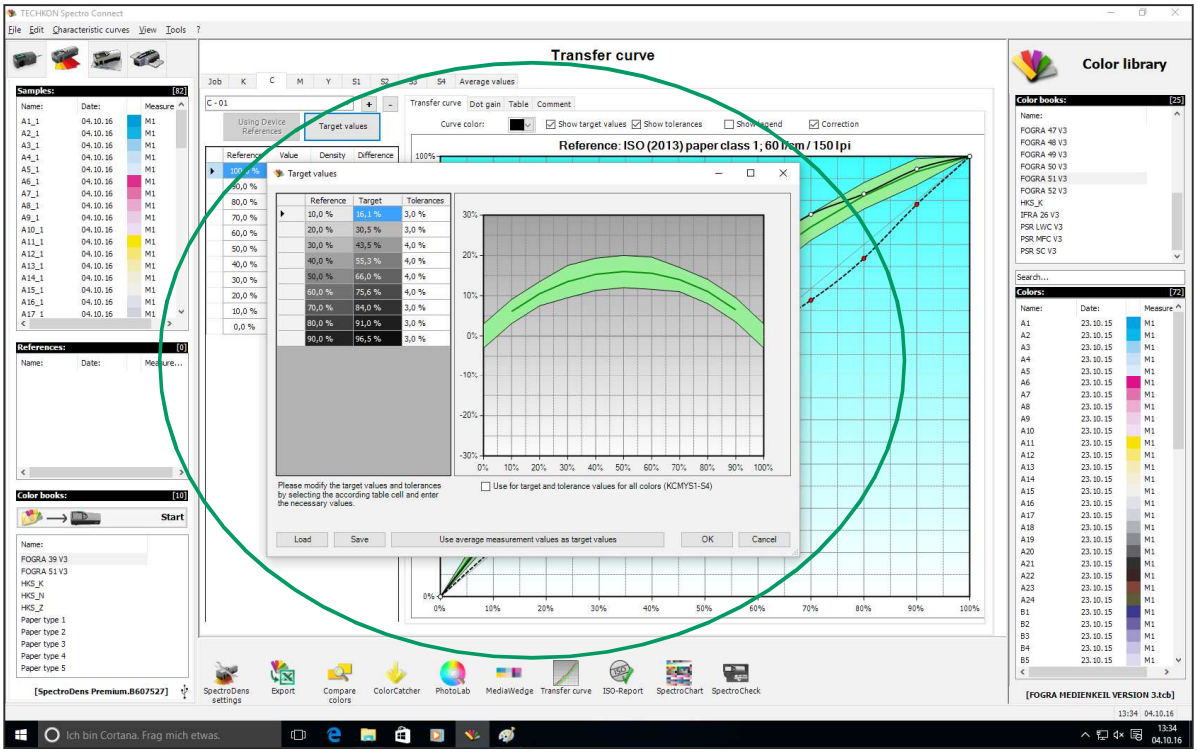
Using the software module **Transfer curve** you can fast and easily determine transfer characteristics on prints and check the compliance of the dot gain according to ISO 12647 targets or individual standards. The software calculates at the same time compensation values for the adjustment during plate exposure.

Values for CMYK as well as spot colors can be analyzed. Measurement results can be displayed as graphics or charts. Furthermore several curves can be compared and average values can be calculated.



Any step wedge can be evaluated. The design of the step wedge can be defined in 1 % steps by using the window **Reference values**.

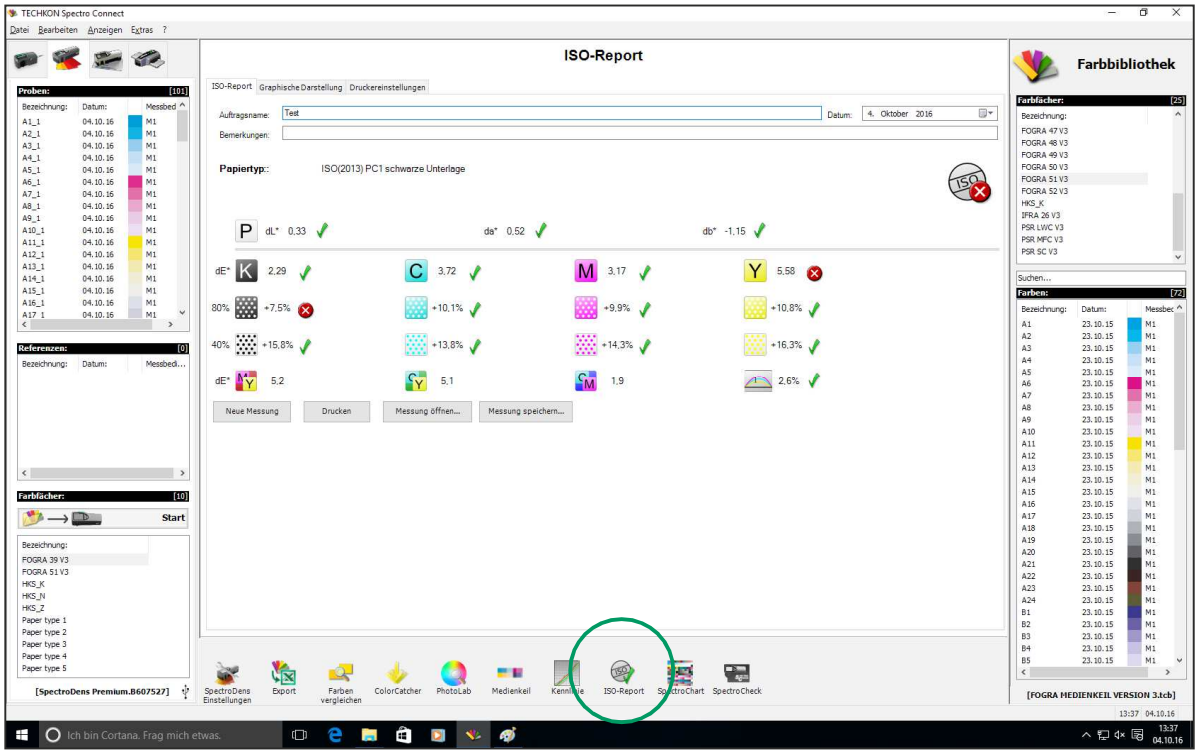


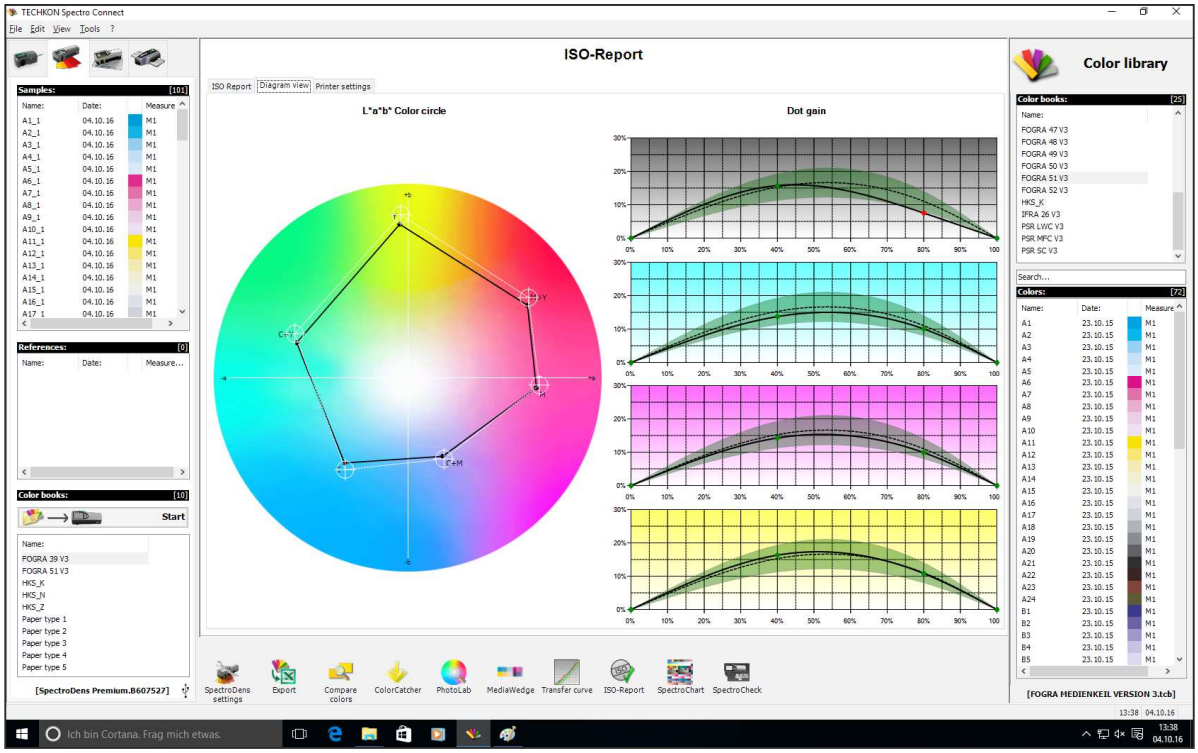


In the section **Target values** the target values can be edited. Furthermore settings for the assignments of the targets can be defined.

3.11 Software module: ISO-Report

The software module **ISO-Report** allows a fast and comprehensive documentation according to the ISO standard. The ISO-Report can be printed out. **ISO-Report** is only available in the SpectroDens Premium version.





3.12 Software module: SpectroChart

The software module **SpectroChart** allows the fast and easy evaluation of test charts like for example ECI 2002, IT8.7/3, Fogra27L, Fogra39L and others.
Related target templates in .ttg-format are deposited in the folder **User → Public → Public Documents → TECHKON GmbH → TECHKON SpectroConnect**.

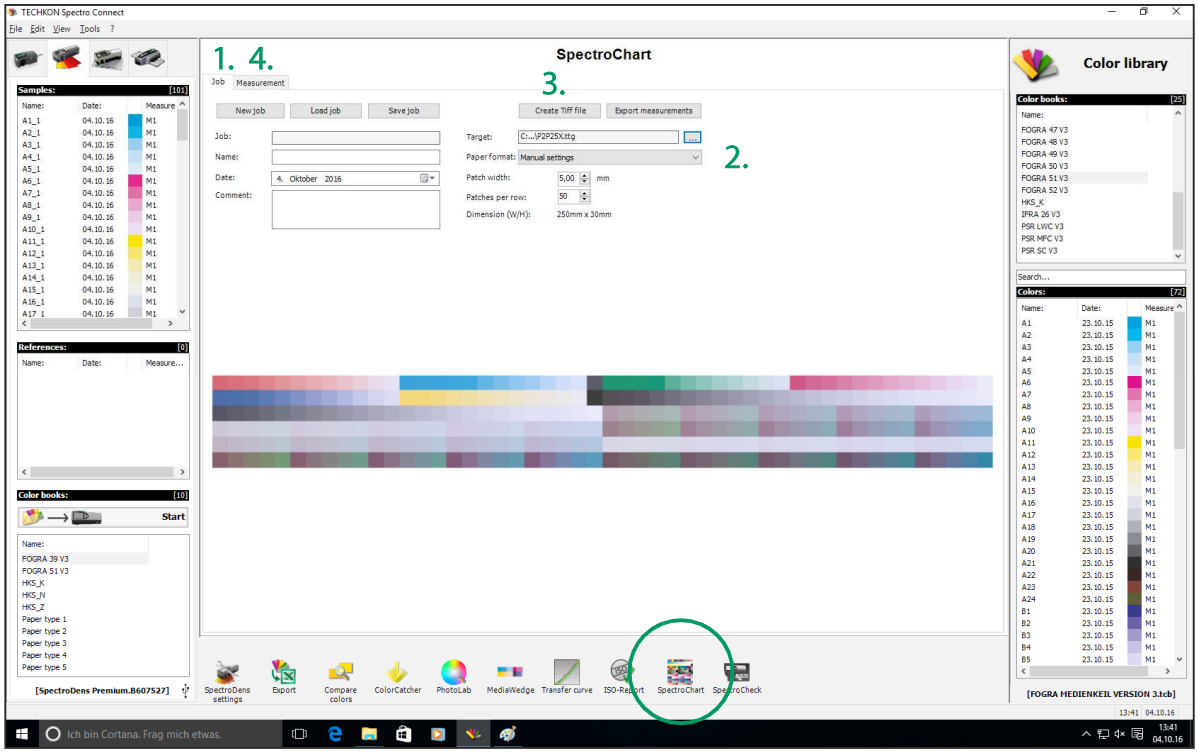
The measurement results are saved in ISO-format. This way they can be imported into common ICC profile generator software.

In the program section **Job** (1.) the job is specified. Here you also choose the target you wish to use. Additionally you can determine its patch width and the amount of patches per row (2.).

The resulting final size of the target will be calculated automatically and then displayed to you. Alternatively you can simply use the presets of a target template or else choose one of the pre-defined paper formats.

When the button **Create Tiff file** (3.) is used, the target can be saved as a tiff file on the PC, where you can initiate to get it printed. Additionally the "Job" section can be used to save the job and to start the export of the measurement values.

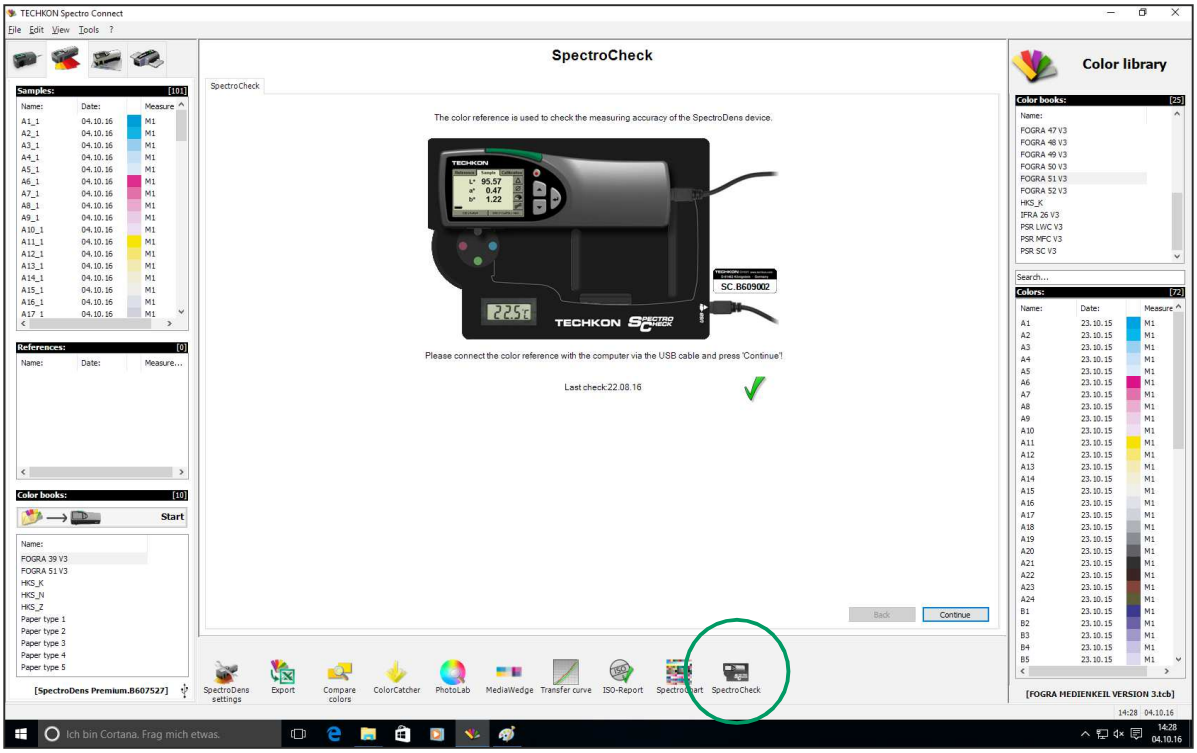
In the program section **Measurement** (4.) the current measurement result is displayed clearly. Furthermore here you can define and activate a ΔE value as tolerance.

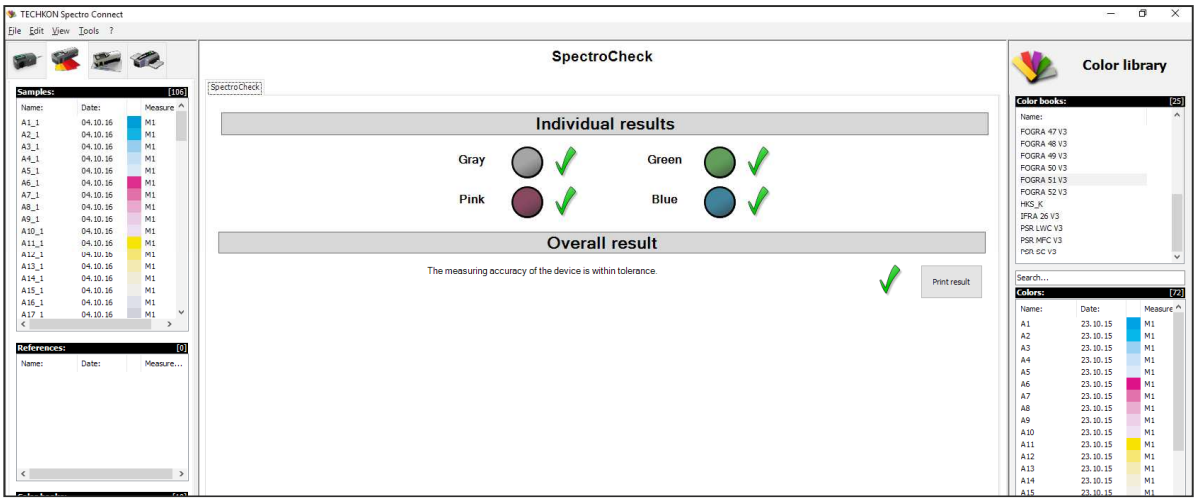


3.13 Software module: SpectroCheck

TECHKON **SpectroCheck** (optionally available) is a color reference used to check the measuring accuracy of the SpectroDens advice.

Connect SpectroDens and SpectroCheck via the USB cable with the computer. The program module SpectroCheck will now lead you step by step through the checking procedure of the measurement device. The information, whether the device corresponds to the technical specifications, can also be printed out.





Appendix

TECHKON
Erfolg ist messbar

Specifications

Measurement geometry	0°: 45° optics according to ISO 5-4
Spectral range	400 to 700 nm in 10 nm steps, spectral resolution 10 nm, pixel distance sensor < 3 nm
Measurement aperture	3 mm round standard; 1.5 mm round optional
Light source	LED, provides measurement conditions M0, M1, M2, M3 according to ISO 13655
Polarization filter	Twice linear crossed, switched on and off per button release
Measurement time	Approx. 1 sec. per measurement; max. 12 seconds in scan mode
White reference	Absolute and relative; absolute white standard integrated and protected in charging console
Illumination types	A, C, D50, D65, F 2/7/11
Standard observer	2°, 10°
Density filter	DIN 16536, DIN 16536 NB, ISO/ANSI T, ISO/ANSI I, ISO E; spectral density Dmax
Density measurement range	0.00 – 2.50 D
Repeatability	0.01 D; 0.03 CIE ΔE*a*b*
Inter-instrument agreement	0.01 D; 0.3 CIE ΔE*a*b*
Display	Color LC backlight display, anti-reflective, 320 x 240 pixels
Power supply	Rechargeable LiFePO4 battery, regulated recharge via charging console with AC adapter, 100 – 240 V, 47 – 63 Hz, approx. 10000 measurements per battery charge, battery level control
Communication port	USB; WLAN module optional
Weight	495 grams
Dimensions	62 x 50 x 185 mm (approx. 2.4 x 2.0 x 7.3 inches)

System requirements for TECHKON software:
Windows 7, 8 or 10; 32- and 64-bit, minimum: IBM-compatible PC with Intel Core Duo processor or comp. processor, 4 GB RAM, 2 USB ports

Performance packages SpectroDens Basic, Advanced and Premium: see page 7

Accessories, spare parts and contents of delivery: see page 8

Manufacturer certificate

applicable for ISO 9000 documentation

Device: Spectro-Densitometer TECHKON SpectroDens

Serial Number:

Manufacturer: TECHKON GmbH • Wiesbadener Str. 27 • D-61462 Königstein
Telephone: +49 (0)6174 9244 50 • Telefax: +49 (0)6174 9244 99
info@techkon.com • www.techkon.com

Certification: The device is compliant with EU directive 2014/53/EU concerning the electromagnetic compatibility EMC and is provided with the CE label. The device is RoHS compliant (class 9). Japanese Radio Law and Japanese Telecommunications Business Law Compliance. This device is granted pursuant to the Japanese Radio Law (**電波法**) and the Japanese Telecommunications Business Law (**電気通信事業法**). This device should not be modified (otherwise the granted designation number will become invalid).

The device complies with the Japanese Type Approval:

R 202-LSE115
T D 16-0031 202

Notice: The supplied AC adapter is according to regulations UL, IP 40, IEC 950 and VDE EN-EC10. The device is to be used only with the original TECHKON SpectroDens AC adapter.

Maintenance: The device is maintenance free. The measurement aperture has to be kept clean from dust. It can be cleaned with clean, compressed air and an optics brush.

We recommend a functionality check-up every 24 months at the TECHKON service center, which includes the issue of a new Manufacturer certificate.

Warranty: The warranty for TECHKON products is 24 months starting with the date of purchase. The warranty is invalid if the damage is caused by improper use of the device. Only original TECHKON spare parts and accessories are to be used.

Recycling: The device is according to §14 ElektroG registered under the EAP no.: DE 98280049. Devices for disposal can be sent directly to the manufacturer.

Calibration: The integrated spectral sensor is calibrated by a white calibration. After performing a white calibration with the supplied absolute white standard integrated in the charging console, the device is long term stable. We recommend to make a white calibration before every measurement series, to ensure the device is calibrated correctly.

The remission values documented on the back of the charging console are derived from a ceramic white standard, which is referenced to measurements taken and certified by the National Institute of Standard and Technology (NIST).

Standards: The calculation of colorimetric values is according to the formulas and tables of ISO 13655:2009 and publications of CIE.

The calculation of densitometric values is according to the formulas and tables of ISO 5-3.

Place	Date	Signature
D-61462 Königstein		

EU-Konformitätserklärung

EC-Declaration of Conformity
Déclaration de Conformité de la CE
Dichiarazione di conformità CE

Hersteller:
Manufacturer / constructeur / costruttore

TECHKON GmbH

Adresse:
Address / adresse / indirizzo

Wiesbadener Str. 27

D-61462 Königstein

erklärt, dass die Produkte:
Declares that the products / déclare, que le produits / si dichiara che il prodotto

Typ:
Type / tipo

SpectroDens

Verwendungszweck:
Intended use / utilisation prévue / uso previsto

Farbmessungen
Color measurements / mesure de la couleur / misurazione del colore

bei bestimmungsgemäßer Anwendung den grundlegenden Anforderungen gemäß EU-Richtlinie 2004/108/EC entspricht und dass die folgenden Normen angewandt wurden:
complies with the essential requirements of the 2004/108/EC Directive, if used for its intended use and that the following standards has been applied: / répond aux exigences essentielles de l'article 3 de la directive 2004/108/EC, prévu qu'il soit utilisé selon sa destination, et qu'il répond aux standards suivants: / soddisfa tutti i requisiti della direttiva 2004/108/EC qualora venga utilizzato per l'uso previsto e che le seguenti norme siano applicate:

angewendete Norm:
Applied standard / standard appliqué / norma applicata issue / édition pubblicato

EN 55022:2006

Ausgabe: 2008-05
+A1: 2007

EN 55024
Ausgabe: 2003-01
1998+A1:2001+A2:2003

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TECHKON GmbH ▪ Wiesbadener Str. 27 ▪ D-61462 Königstein/Germany ▪ Telefax: +49 (0)6174 9244 99 ▪ E-mail: info@techkon.com

TECHKON Registration card

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☐ Please put my E-mail address on the mailing list for the TECHKON-Newsletter

TECHKON GmbH
Wiesbadener Str 27

D-61462 Königstein

Via telefax to: +49 (0)6174 9244 99

Name: _____

Company: _____

Department / Job title: _____

Address: _____

City / ZIP-Code: _____

Country: _____

Telephone: _____

Telefax: _____

E-mail: _____

Your TECHKON-Dealer: _____

Device Serial number: _____
(Label on the bottom of the device)

Erfolg ist messbar

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