TECHKON

Erfolg ist messbar

Scan-Measurement-System
SpectroDrive
Software
ExPresso 4

Manual

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Version 3.2, April 2017

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Welcome

We welcome you among the worldwide community of users of TECHKON products. We are happy that you have selected this high-quality measurement instrument. It will be a valuable tool for your day-to-day quality control tasks. With this manual we invite you to learn how to use SpectroDrive, the software ExPresso 4 and SpectroConnect.

The manual is divided into four chapters:

CHAPTER 1: General description of the measurement system

CHAPTER 2: Installation of SpectroDrive and the software ExPresso 4

CHAPTER 3: How to use SpectroDrive and the software ExPresso 4

CHAPTER 4: How to use the Windows software SpectroConnect

You will be fascinated how easy the system is to use. You will know how to work with SpectroDrive after having read this manual for only a few minutes. The second chapter describes the assembly of SpectroDrive and the installation of the software ExPresso 4. The third chapter describes the operation of SpectroDrive and gives detailed information about the measurement functions.

Please get the device registered by using the registration card, which you will find in the appendix of this manual. That way we can keep you updated about product news.

Please visit us as well on the internet at www.techkon.com.
You will find useful information about the complete product range and new software versions.

Do you have any suggestions for improvements or do you require information that goes beyond the contents of this manual? We will be glad to hear from you. Your suggestions or questions make an important contribution to the continuous optimization of our documentation and products.

Your TECHKON Team

Contents

CHAPTER 1: General description of the measurement system

1.1 Product description 5
1.2 Packing list 10

CHAPTER 2: Installation of SpectroDrive and the software ExPresso 4

2.1 Assembly of SpectroDrive 11
2.2 Installation of the software ExPresso 4 12

CHAPTER 3: How to use SpectroDrive and the software ExPresso 4

3.1 Operation of SpectroDrive 13
3.2 Care and maintenance 16
3.3 Software overview ExPresso 4 18
3.4 Software settings 21
3.5 Defining and running a print job 41

CHAPTER 4: How to use the Windows software SpectroConnect

4.1 Software description 64
4.2 Installation 64
4.3 Overview / Software module: Compare colors 65
4.4 Software module: SpectroDrive settings 66
4.5 Device update 67
4.6 Software module: Export 68
4.7 Software module: ColorCatcher 69
4.8 Software module: PhotoLab 70
4.9 Software module: Media Wedge 73
4.10 Software module: SpectroCheck 75

APPENDIX:

Technical specifications
Manufacturer certificate
EC-Declaration of Conformity
Registration card

Chapter 1

General description of the measurement system

1.1 Product description

High quality and productivity

The new generation of the proven Scan-Measurement System SpectroDrive combines decisive advantages: Precise measurements thanks to an ISO-compliant measuring head, technical reliability and high measurement speed. It can be fully integrated into the printing process. The result: a productivity and quality boost for your printing press.

The system consists of two components: The motorized measurement device scans the complete color bar on a printed sheet within seconds and simultaneously sends the spectral measurement data wirelessly to the PC. Here all relevant information for controlling the printing press is clearly displayed by the TECHKON ExPresso 4 software.

Increase profitability

Due to the trend of smaller print jobs and shorter press runs the time from starting a press to getting it "in color" and running with consistent quality is cost critical. SpectroDrive reduces this "non-productive" and therefore expensive set-up time dramatically. You will increase profitability thanks to substantially reducing paper and ink waste and getting more precious time out of your printing press. The system makes your printing jobs predictable and calculable. In addition, the complaint rate will go down significantly and your customers will appreciate the sensible gain and reliability of the print quality. ISO-compliant printing becomes easier than ever before.

The high rate of return of investment is amazing. The relative low – and only one time – investment will show in recurring profits almost immediately. Also older printing presses get a productivity boost thanks to SpectroDrive.

Ease of use and high speed measurement

Setting up a printing press can be compared with starting a jet plane. It is a time-critical process, where the press operator – like a pilot – must observe and perform a multitude of important tasks at the same time. Hence, during the development of SpectroDrive great care was taken in delivering a system that is easy to use and fast, to make working with SpectroDrive even more intuitive and convenient.

For example, a laser beam can be activated to support the exact positioning of the print control strip. Furthermore the measurement device has only one button to start the measurement process. Installation is simple as well. After a few minutes the system is operable and ready to take measurements.

Due to its aluminum unibody case the new SpectroDrive is particularly robust and reliable. Of course SpectroDrive is able to handle variable scan lengths and fits to any printing press format. The battery charging is inductive, fast and sustainable.

Two measurement systems in one

This statement relates not only to the technical fact that the spectral measurements allow displaying densitometric and colorimetric data. It also points out that SpectroDrive can be used as a scanning device as well as a hand-held instrument for single measurements. Just take the device from the horizontal track and position it wherever you want to take a color measurement. SpectroDrive now also features an integrated display that shows the measurement values of spot measurements directly at the device.

Software ExPresso

The Windows software TECHKON ExPresso 4 has a self-explanatory user interface which can be operated via touch-screen. The software offers a comprehensive tool set comprising measurement of spot colors, support of up to 16 print units, front-side and reverse printing, display of color density, dot gain, gray balance, CIE L*a*b*-values and recommendations on how to adjust the ink on the press. This is only an extract of the complete functionality.

Thanks to its modularity TECHKON ExPresso 4 is expandable and versatile. The measurement data can be exported into other software applications that connect real-time to printing presses to enable a “closed loop” turn-key solution. In addition, the ExPresso software can export measured data to standard applications such as Microsoft Excel™.

All advantages at a glance

Easy to handle

- Fast, motorized scanning by pressing the green measurement button on the touch-screen or on the device itself
- Automatic white calibration
- Windows-software TECHKON ExPresso 4 can be operated with or without the touch-screen
- The device can easily be used as hand-held device for spot measurements as well

Easy to install

- Installation is made within five minutes without any major assembly effort
- Complete system is maintenance free
- Measurement system can be flipped 180°, if the color bar is on the opposite side of the printed sheet
- Wireless, fast data transmission per WLAN
- No vacuum air suction is necessary to hold down the printed sheet

Modular and compact

- Works with any sheet or press format
- Horizontal track can be shipped in any length up to 206 cm
- Space-saving measurement device fits on any table
- The mounting table can be inclined up to 45°
- Delivery contains all components supplied

Complete measurement information

- Any color bar can be measured (patch size has to match aperture size)
- Color bar can be at any location on the printed sheet
- No limitation in paper thickness
- Automatic polarizing filter function for densitometric and colorimetric measurements

Accurate

- Precise spectral engine with automatically insertable polarizing filter
- Patented measurement head for easy positioning conforming to ISO 13655
- Solid aluminium unibody case for reliable function in a harsh industrial environment

Fast

- High resolution spectral measurement of a complete color bar within seconds (e.g. 500 mm sheet length in about 3 seconds!)
- Wireless data transmission to the PC during scan in real-time
- Information overview displays all relevant parameters for quality control

Using SpectroDrive as a hand-held unit is simple. Just position the compact measurement head above the sample and press the green measurement button. The measurement value is transmitted instantly to the PC.

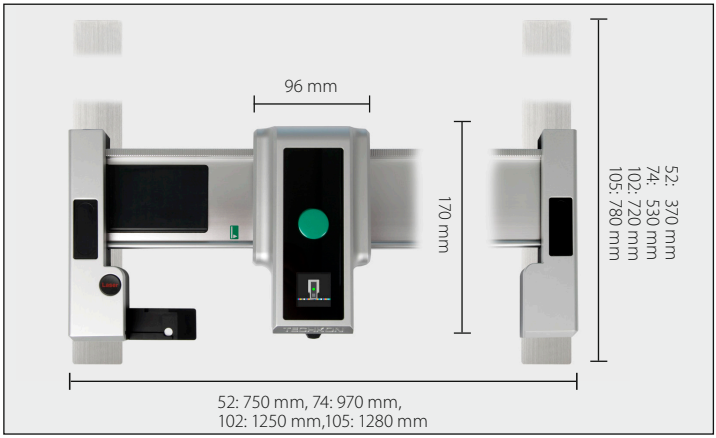
TECHKON SpectroDrive is delivered as a complete turn-key system. Within a few minutes the system is up and running.

One unique feature of SpectroDrive is its flexibility to be used with any press type or format.

Formats

52: for printed sheet 00 (B3+, 370 x 520 mm)
74: for printed sheet 0B (B2+, 520 x 740 mm)
102: for printed sheet 3B (B1+, 720 x 1020 mm)
105: for printed sheet 3B+ (B1+, 780 x 1050 mm)
Special formats (up to 2100 mm system length/ 2060 mm scan length) on request

Dimensions



Performance packages

The scan-measurement device SpectroDrive and the Microsoft Windows software ExPresso form a complete quality control system for increasing productivity and quality of a printing press. There are two different versions available:

SpectroDrive + ExPresso Basic
consists of the spectral measuring device SpectroDrive and the Microsoft Windows software ExPresso Basic with the following functions:

- Ink zone specific density display
- Color density for CMYK and spot colors (spectral density)
- Densitometric gray balance
- Dot gain, dot area, printing contrast
- Slur/doubling value
- Target values, tolerances, OK-sheet
- Front- and reverse-printing
- Works with any color bar length
- Display of single measurements when used as a hand-held device
- Measurement data export (e.g. JDF-format)
- Statistical analysis, report generator
- Supports up to 6 printing units

SpectroDrive + ExPresso Pro
contains the same functions as the Basic package and additionally:

- Ink zone specific colorimetric CIE L*a*b*and ΔE*a*b* display
- ΔL*a*b*, CIE L*C*h*, ΔL*C*h*
- **InkCheck**: recommendation for ink key setting
- Display and evaluation according to ISO 12647 (PSO)
- GrayGuide (gray balance) according to Gracol G7™
- OBA-Check
- Supports up to 16 printing units

A post-purchase software-upgrade from the Basic- to the Pro-version can be done easily.

1.2 Packing list

Measurement device SpectroDrive and the supplied system components

Contents of delivery

- Measurement device SpectroDrive
- Left holder incorporating charging console with white standard and AC adapter with universal plugs
- Horizontal track, right holder, two vertical bars
- WLAN-module for wireless data transmission, USB cable
- Manual with ISO 9000 compliant certificate (pdf on CD),
- Manufacturer certificate
- Screwdriver, 4 screws
- Optional: CD with software ExPresso 3, USB-dongle (software protection key)

System requirements: for TECHKON software:
Microsoft Windows 7, 8 or 10; 32- and 64-bit, minimum: IBM-compatible PC with Intel Core Duo processor or comparable processor, 4 GB RAM, 2 USB ports;
Screen resolution for TECHKON ExPresso: minimum 1280 x 1024 pixel

Optional accessories

- Color reference SpectroCheck for checking the measuring accuracy
- Print control strips TECHKON TCS, available as EPS- and pdf-files on CD (can be downloaded free of charge at www.techkon.com)
- Software-upgrades from ExPresso Basic to ExPresso Pro

Replacement parts

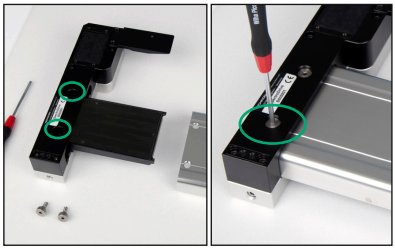
- Left holder with charging console and white standard ▪ Horizontal track
- AC adapter ▪ Rechargeable battery ▪ WLAN-module

All parts are easy to exchange.

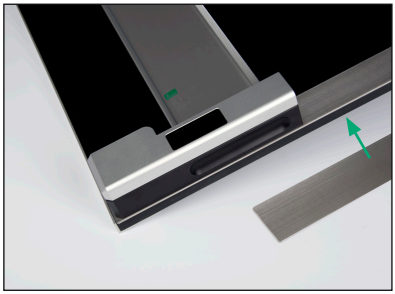
Chapter 2

Installation of SpectroDrive and the software ExPresso 4

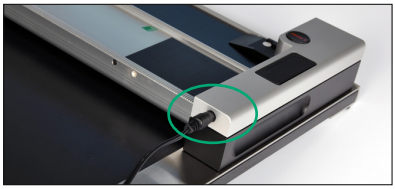
2.1 Assembly of SpectroDrive



- Connect the horizontal track with the left and right holder as shown on the images. Before placing the holders upside down, put a soft material underneath to avoid scratches. Before tightening the first screw, insert the second screw and assure that the holder is correctly aligned.

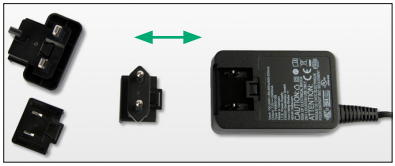


- The two vertical bars are attached vertically at the right and left side on a flat table. Before adhering them, it is important to check that they are parallel and have the right distance to each other. We advise to mark the position with a pencil first. Now attach the two vertical bars, which have self-adhesive tape on the backside to the table or console. Assure, that the vertical bars are parallel and well aligned in order to hold the left and right holder which will attach magnetically to the vertical bars. Preferably the table will have a lay-on edge for positioning the printed sheet.



- Connect the plug of the AC adapter with the charging console. The AC adapter can be used universally for 100 – 240 V.

There are three adapter plugs for different countries. To change an adapter plug, just unlock the lock, pull the plug off the AC adapter and push in the new one. Make sure it is connected firmly.



Connect the mains plug to the power socket. The socket must be located near the facility and must be easily accessible. Do not use the power plug if the power cord is damaged. Always use the original TECHKON Spectro-Dens AC adapter. The use of other power sources is hazardous.

2.2 Installation of the software ExPresso 4

System requirements

- Microsoft Windows 7, 8 or 10; 32- and 64-bit, minimum: IBM-compatible PC with Intel Core Duo processor or comparable processor, 4 GB RAM, 2 USB ports; screen resolution for TECHKON ExPresso: minimum 1280 x 1024 pixel

The software is optimized to be operated with a touch sensitive screen.

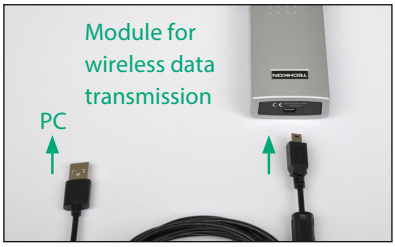
However, working without a touch-screen by using a conventional mouse / trackpad and keyboard is also possible.

Recommended color bar:

Print control strip TECHKON TCS Digital (included in delivery).

Installation

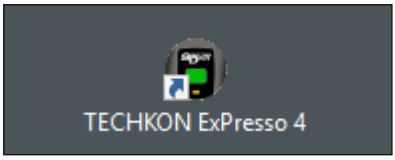
It is important to carry out the following steps in the right order to make sure that the USB device drivers will be installed properly.



WLAN-module for wireless data transmission

1. Make sure that the USB-dongle (software protection key) and the module for wireless data transmission are **NOT** connected to the PC. Insert the TECHKON CD into the CD drive of the computer.

2. Select **ExPresso Installation** from the menu. 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 module for wireless data transmission with the USB cable and the USB-dongle to the PC.

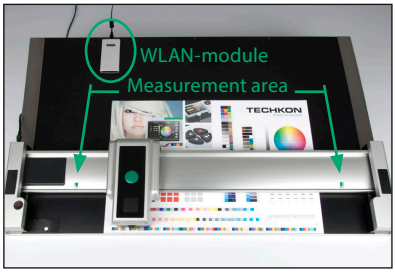
4. TECHKON ExPresso can now be launched.

Chapter 3

How to use SpectroDrive and the software ExPresso 4

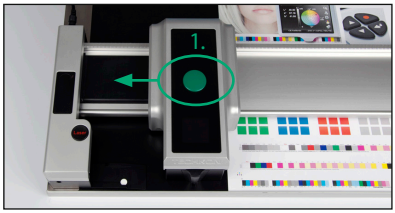
3.1 Operation of SpectroDrive

Automatic measurements



- Place the measurement device on the horizontal track.

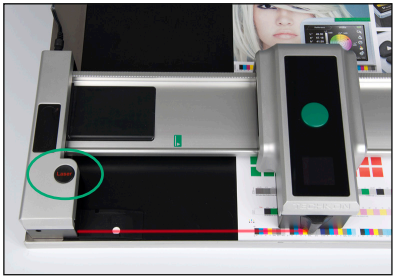
- The module for the wireless data transmission has to be positioned as close as possible to the measurement device with the front pointing to the measurement system as shown on the image. Please connect it to the PC via the USB cable AFTER the installation of the software



- By pressing the green measurement button the device will move into the charging station at the left, where it is automatically charged, which is indicated by an animated battery symbol in the device display.

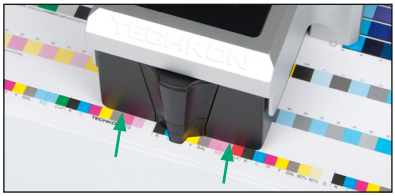
- You can align the measurement system in vertical direction. By keeping the black buttons on the left and right holder pressed you reduce the magnetic adhesion of the holders.

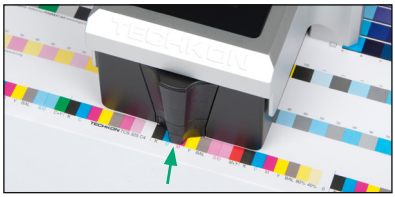
- First, position the printed sheet at the lower lay-on edge.



- Then move both holders vertically, so that the measurement head is exactly on top of the color patches. You can use a red laser beam for the adjustment. Press the **Laser**-button on the charging console. If the laser beam turns off before you could finish the adjustment of the print control strip, just press the **Laser**-button again.
Warning: To protect your eyes, do not stare into the laser beam.

It is important that the measurement aperture always covers the color patches completely during the entire scan.





- When using color bars with a patch height smaller than 4,5 mm, the edge of the measurement head of the device has to be placed exactly at the upper edge of the color bar, to ensure that the measurement head is positioned correctly on the patches.

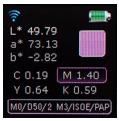
- When using color bars with a patch height higher than 4,5 mm, the measurement head has to be placed with the measurement aperture at the bottom edge of the color bar.

Spot measurements

- To carry out a spot measurement just remove the measurement device from the horizontal track, position it with the measurement head on a single measurement patch and press the green measurement button shortly.

The measurement data are shown in the device display as well as in the window **Spot measurement** of the ExPresso software.

Display modes of the device display



Results of a spot measurement; densities CMYK and CIE-Lab values; display of the measurement conditions

Warning: the unit has been blocked while driving

Scan is in progress

Paper white calibration is performed

After a few minutes of inactivity on the charging station the device goes into the stand-by mode

Absolute white calibration is performed

How to measure

Please ensure that the sample is located on a solid and flat surface. There must not be a distance between the measurement head and the sample where light could pass through, because this can influence the measurement. The color of the background material underneath the measurement sample can have an influence on the measurement result. Different technical standards describe which backing material to use. In the printing industry the following procedure is widely used: White backing for single printed papers and black backing for double printed sheets in order to avoid that the back printed side might shine through the paper and influence the measurement.

Paper white calibration

A paper white calibration can be carried out by keeping the green button pressed for a few seconds. The measurement aperture has to be on top of a non-printed area of the sheet.

When SpectroDrive is on the track, the paper white calibration is performed by software command (see p. 34).

Charging

Completely charging an empty battery will take approximately four hours. SpectroDrive has a regulated charging management. This means it will power-charge an empty battery, so the device can be used again after a few minutes. On the other hand, there is no overcharging of full batteries.

Disposal instructions: Please dispose of the battery only in a designated recycling center.

Automatic turn off

When the device is not located at the left holder in the charging position and is not in use, it will switch off automatically after three minutes. It can be reactivated by pressing the green button on the device.

Device information and safety instructions

The use of this device in a different way than recommended by TECHKON GmbH can endanger the device safety.

WARNING: This device may not be used in potentially explosive atmospheres.

Please protect your eyes and do not look directly into the optics when the device is switched on.

Operating conditions: Ambient temperature: 10 to 35 °C, max. 30 to 85 % rel. humidity (non-condensing); storage temperature: -20 to 50 °C.

3.2 Care and maintenance

Cleaning

SpectroDrive is a highly-precise optical instrument. It is designed to work in harsh, industrial environments. However, it should be handled with care. Avoid mechanical shocks, heat, dusty or humid environments.

The measurement head with the optical system is sealed against dust and dirt. Nevertheless take care that the visible, open measurement aperture is always free of dust. You can clean the measurement aperture with oil-free, clean compressed air and a brush used for cleaning photographic equipment. Clean the device casing only with a soft cloth and a non-aggressive plastic cleaner. Never use alcohol or chemically aggressive solvent-based cleaners which can destroy the surfaces.

The same procedure is valid for the white standard which is integrated in the charging console. A soft cloth made of micro-fibers is especially well suited for cleaning the white ceramic tile. If the white standard should be defective, it has to be replaced completely.

Please do not stick any labels at the bottom of the device. This could lead to faulty measurements, because the defined distance – which is important for the correct optical field of depth – might not be maintained.

Error handling

- Should SpectroDrive do not work properly, first check, if the ExPresso software is running correctly.

- The status bar in the lower right corner will display, if the device, the module for wireless data transmission and the USB-dongle communicate correctly with the PC.

- It can be helpful to plug-off and re-connect the module for the wireless data transmission from the USB connection when problems occur.

- Restarting the software ExPresso is also recommended to solve software problems.

- Check that the right measurement device is selected in the software settings. If **SpectroDrive Simulator** is selected, no real measurements will be carried out.

- Check if the AC adapter is connected correctly to the mains plug and the charging station. Check if SpectroDrive is charged in the home position (The battery symbol is animated during charging).

- If the device does not communicate with the software and does not work by pressing a button, but the device display is on, move it manually from the charging position. Now, wait until it switches off automatically after three minutes. Then, turn it on again by pressing the green button.

Warranty and service

The warranty for TECHKON products is 24 months starting with the date of purchase. Consumable and wearing parts are excluded from this. The invoice is the certificate of warranty. The warranty is invalid if the damage is caused by inadequate use of the device.

Should a TECHKON product do not work according to the specification, please contact us before sending us the device. In most cases we can solve the problem over the phone or via E-mail.

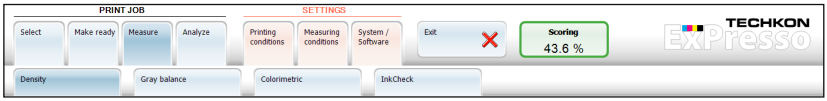
Inspection intervals

TECHKON SpectroDrive is to a large extend maintenance free. Nevertheless we recommend to validate the complete functionality of the devices in a 24 months time interval in the TECHKON service center. We offer a complete device check as a service package. Please contact us for details.

For a flat fee the device will be cleaned, checked and recalibrated. In case a repair or exchange of components should be necessary we will inform you. Please send the device always securely in the carrying case with complete accessories.

3.3 Software ExPresso 4 overview

The software ExPresso is clearly structured. The menu bar comprises the four sections **Print job** (blue buttons), **Settings** (red buttons), **Exit** (blue button) and **Scoring** (when active). The appropriate submenu layers follow this color system.



PRINT JOB:

- **Select** — P. 41
- **Make ready** — P. 42
  - Print job info — P. 42
  - Press / Inks — P. 43
  - Sheet / Color bar — P. 44
  - Target values / Tolerances — P. 46
- **Measure** — P. 48
  - Density — P. 48
  - Gray balance — P. 51 (GrayGuide P. 52)
  - Colorimetric — P. 53*
  - InkCheck — P. 54*
- **Analyze** — P. 57
  - ISO-report single measurement — P. 57*
  - ISO job report — P. 58*
  - Report single measurement — P. 60
  - Job report — P. 61
  - Scoring Single Measurement — P. 62
  - Scoring Job — P. 63

SETTINGS:

EXIT:

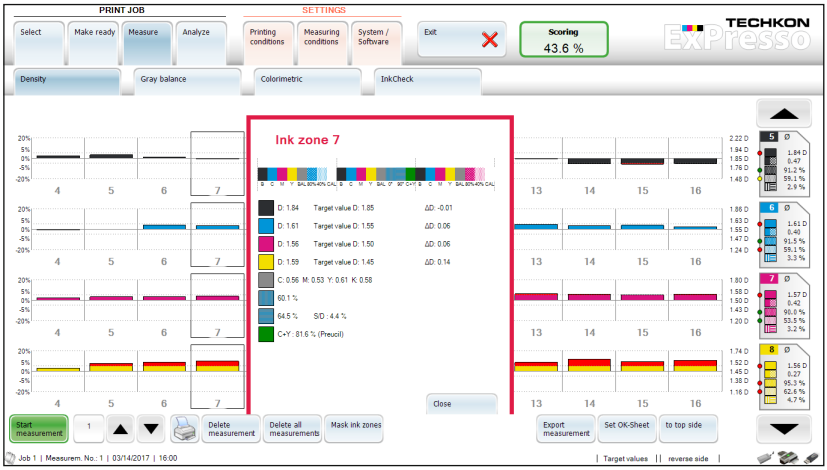
P. 63

By clicking on the device icon in the right section of the **menu bar** (1.), one gets a direct access to important device settings. A window is displayed with the submenus **Measurement device**, **Measurement settings**, **Export to other applications** and **Update** (see p. 33 – 36).

Below the menu bar the **program window** (2.) is displayed which is activated by the appropriate menu item.

The following example shows the program window **Density** after a measurement was carried out. In this program window a click on the bar graph opens a second window displaying detailed measurement data of the ink zones.

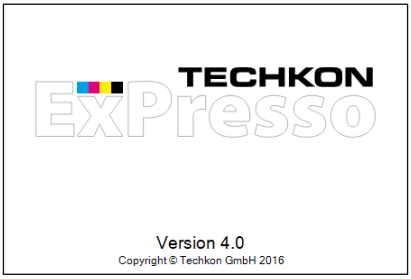
The **command line** (3.) of the active program window is located at the bottom of the program window.



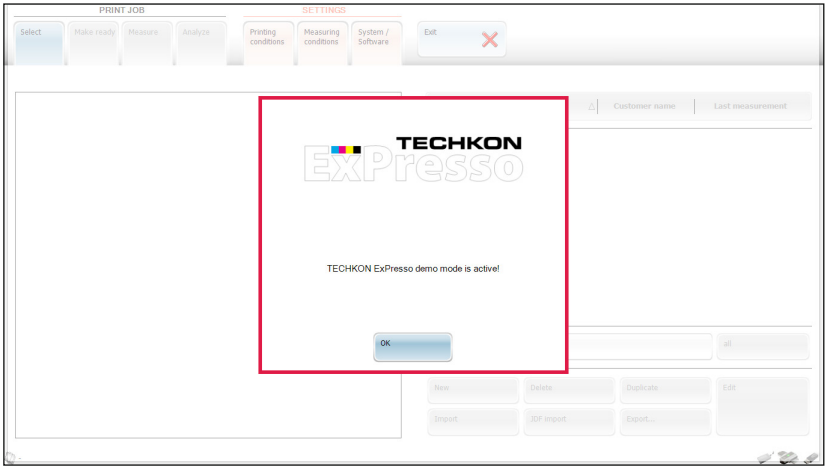
The bottom area of the screen is a **status line** (4.), showing at the right side the connection status of the module for wireless data transmission, of the measurement device (SpectroDrive, SpectroDrive Simulator or SpectroJet) and of the USB-dongle. When moving the mouse pointer on the icons of one of these components, you get additional information, e. g. the density- and colorimetric-settings of the device or the software version.

3.4 Software settings

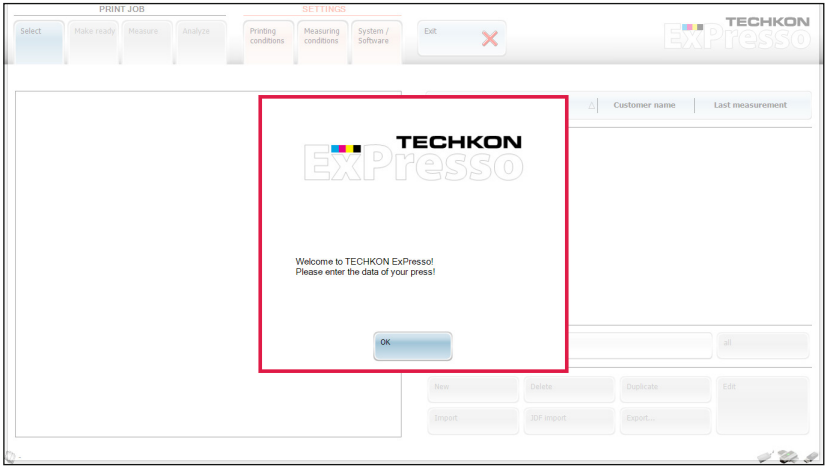
When the software is started by a double click on the TECHKON ExPresso icon, the software routine checks first, while displaying the intro icon, whether a measurement device, a dongle and a module for wireless data transmission are connected.



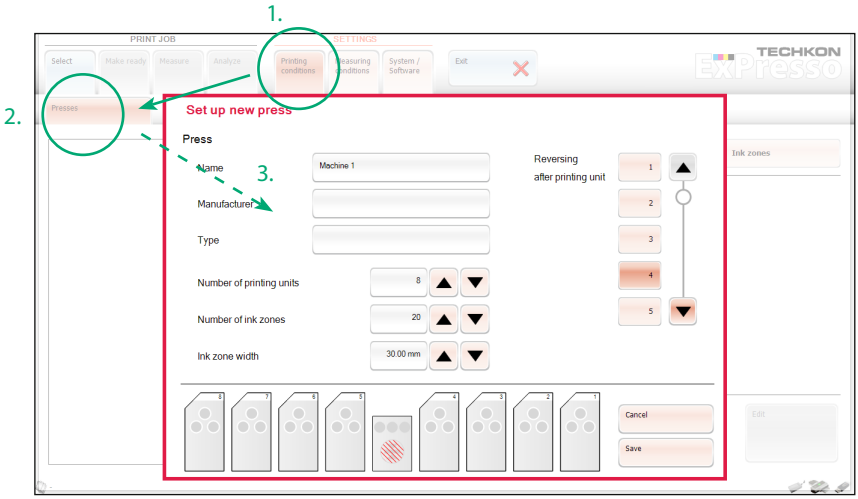
If the software does not detect any measurement device, an information window lets you know that the ExPresso demo mode is active. This simulator provides only virtual measuring data for test- and demo-purposes.



If you have not defined any printing machine in the menu section **Settings → Printing conditions → Presses** up to now, you will see the following info window:



You can set up a printing machine which fits to your print job, by clicking on the **New** button in the menu item **Presses**. When the data of the machine have been edited in the pop-up window and are subsequently saved, the new printing machine appears in a listing in the right section of the menu, where it is at hand if you wish to change the press settings later.



Certain settings are done only once, after the software is installed or have to be changed only occasionally when fundamental parameters have altered. For example the menu language, the selection of the measurement device or the definition of a new printing press will be set once and do not have to be set for each and every print job to be carried out later.

This kind of settings is made by pushing one of the red **Settings** buttons (1., p. 22) and then selecting one button from the sublayer (2., p. 22). The referring window opens and can be edited (3., p. 22).

All settings which were made, can later be recalled when defining a **Print job**, where the screen will appear in blue color.

When you start ExPresso, the sublayers **Make ready**, **Measure** and **Analyze** in the section **Print job** are shaded an can not be activated until you have set up all necessary informations concerning your printing- and measurement-conditions in the **Settings**. Finally you have to click on the **Select** button in the **Print job** section to define or select a print job. Now all menu items in the **Print job** section can be used.

As soon as the sublayer **Measure** is active, the button **Scoring** appears, showing the overall scoring result in percent of the last scan measurement carried out. Thanks to the green, yellow, orange and red coloring of the button the user knows at a glance, to which range the result belongs. A double click on this button opens the menu **Scoring Single Measurement** displaying detailed scoring results. These values refer to defaults, set under **Settings → Measuring conditions → Scoring**.

The following settings can be made in the Printing conditions section:

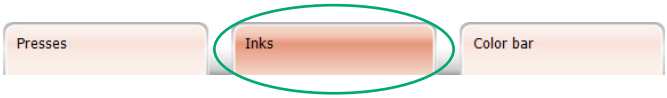
Printing conditions – Presses

- Name: text box to define a name of the printing press
- Manufacturer: text box (not mandatory)
- Type: text box (not mandatory)
- Number of printing units: 1 – 6 for ExPresso Basic, 1 – 16 for ExPresso Pro
- Number of ink zones: max. 100
- Ink zone width: in mm, max. 100 mm
- Reversing after printing unit: if the printing press has a reversing unit, the location can be set

You can set up new printing presses (see p. 22) and edit or delete the ones which are already defined and listed in the right section of the **Presses** window.

TIP: By double clicking on one of the printing presses which are listed in the right section of the main window you switch directly into the appropriate **Edit** window. You find this possibility of quick editing in all of the **Print job**- and **Settings**-windows which contain such listings. The order of the listed elements can be changed by clicking in the header of the register.

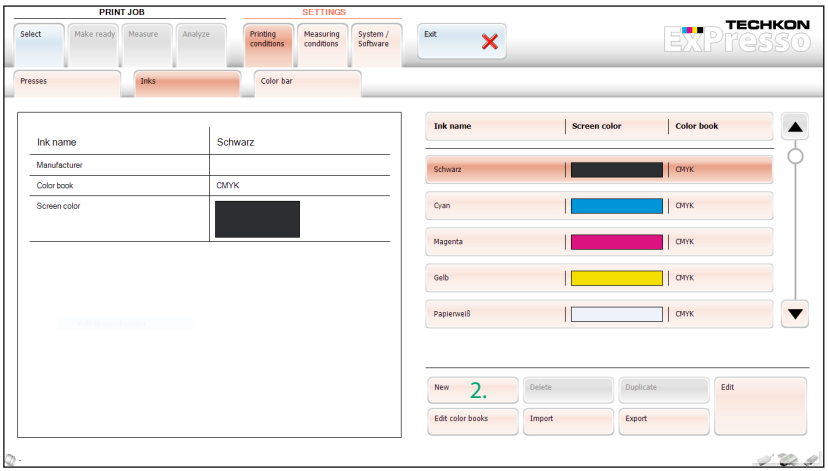
Printing conditions – Inks



The list of inks included in the database is displayed. The four process colors C, M ,Y and K as well as the trapping colors M+Y, C+Y, C+M, C+M+Y (1.) and paper white are pre-installed. They are stored in the color book CMYK and are already marked by a screen color. These four process colors resp. color combinations can not be deleted or duplicated.

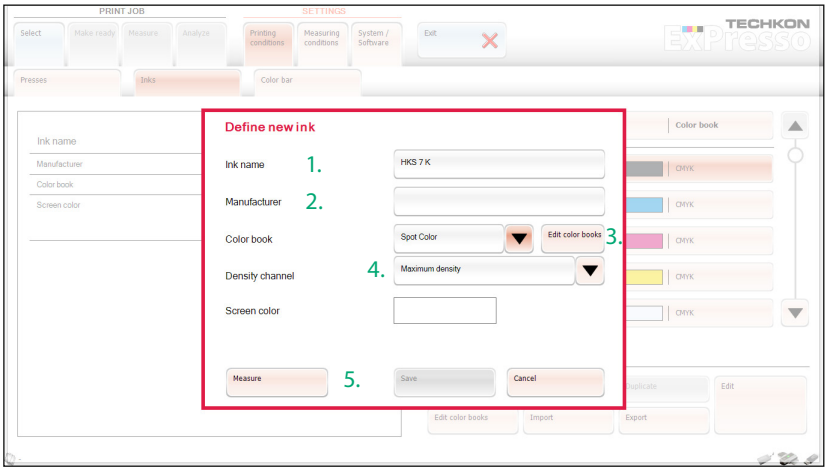
But it is possible to edit further inks and to import, duplicate and export them.

By using the **Export** function you can hand over individually edited inks and color books easily to another printing machine.



The definition of new inks makes it possible to edit and measure customary spot colors, for example the colors of a HKS color book.

- First click on the **New** button (2.), to open the window **Define new ink**.



- Now enter an ink name (1.) for the spot color. Additionally the manufacturer (2.) can be defined.

- You can choose an already existing color book for the new ink or generate a new one.
You edit a new color book by clicking on the button **Edit color books** (3.). In the window which opens now you choose New, enter a name for the new color book and confirm the process with **OK**.

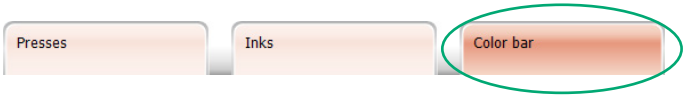
- Choose **Maximum density** (4.) for density channel for spot colors.

- Now click on the green button to activate the **Measure** function (5.), after you have placed the measurement head of the device on the color patch you wish to measure. The procedure will be carried out and the software adds a screen color to the new ink.

- Complete the definition of the spot color by pressing the **Save** button. The new ink appears now in the ink list in the right section of the **Inks** menu.

Thus any customary spot colors or individual colors can be measured and added to the ink listing.

Printing conditions – Color bar

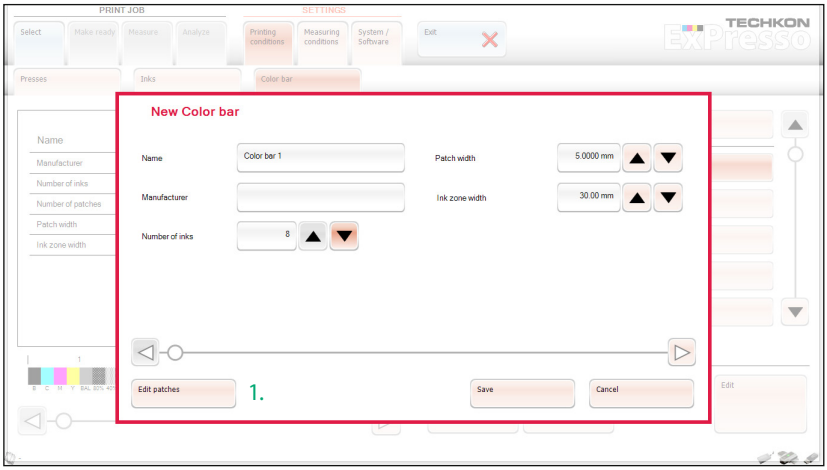


In this menu section the list of color bars included in the database is displayed. We recommend the use of the TECHKON TCS print control strips, because their design is based on ink zones and covers all relevant measurement patches. Other definitions can be loaded by using the **Import** function.

But not only already existing color bars can be used and edited. You can also generate your own printing definitions in ExPresso.

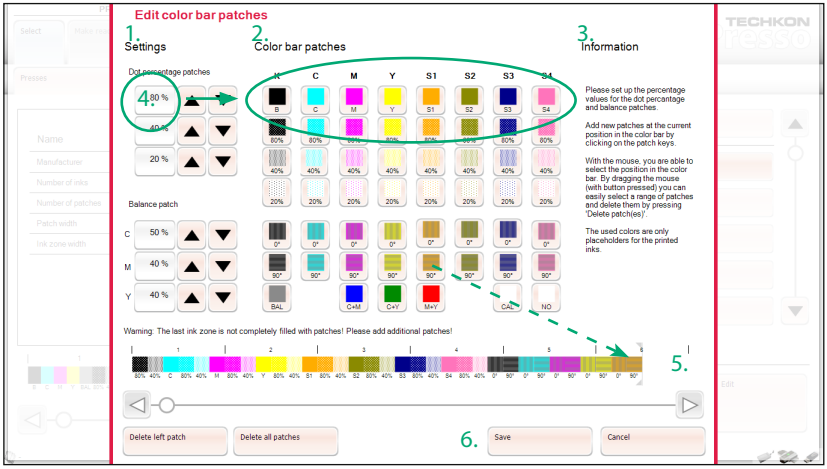
Please note that the used colors are only placeholders for the printed colors in the print job.

When you click the **New** button in the **Color bar** menu, the window **New color bar** opens.



- Edit the text boxes **Name**, **Manufacturer**, **Number of inks**, **Patch width** and **Ink zone width**. Then click on the **Edit patches** button (1.).

The window **Edit color bar patches** opens, which is divided into the three section **Settings** (1.), **Color bar patches** (2.) and **Information** (3.).



- First define in **Settings** three percentage values for the dot percentage patches and three for the balance patch (4.), which both are listed in **Color bar patches**.

- In the section **Color bar patches** now successively compile your individual color bar by clicking on the color bar patches. The color bar which you are creating is displayed in the lower part of the window (5.).

- If you edited 8 in **Number of inks** in the previous **New color bar** window, now you have the four process colors C, M, Y, K as well as 4 spot colors at your disposal. Each of these colors is given as solid ink, dot percentage value and slur / doubling patches. The bottom line offers a balance patch (BAL), the trapping patches (C+M, C+Y and M+Y), a calibration patch (CAL) and an empty patch (NO).

- Accidentally set color bar patches can be marked directly in the color bar (by sliding over them with the mouse button pressed) and then deleted by clicking on the **Delete selected patches** button. To add patches later, you can set with a mouse click a marker in the color bar. To the left of this marker the new patches will be filled in.

- Finally the **Save** button will save the currently generated color bar (6.) and it will be listed automatically in the first place of the already existing color bars.

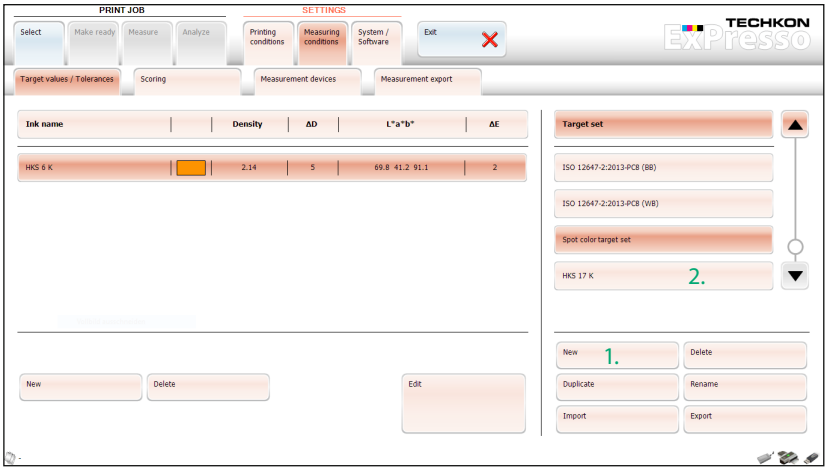
The following settings can be made in the in the Measuring conditions section:

Measuring conditions – Target values / Tolerances

A list of data sets for target values and tolerances for the paper classes 1 - 5 resp. 1 - 8 will be displayed. It is based on ISO 12647-2:2007 and 12647-2:2013 color values for CMYK.

Individual target and tolerance settings can be made as well – also for spot colors.

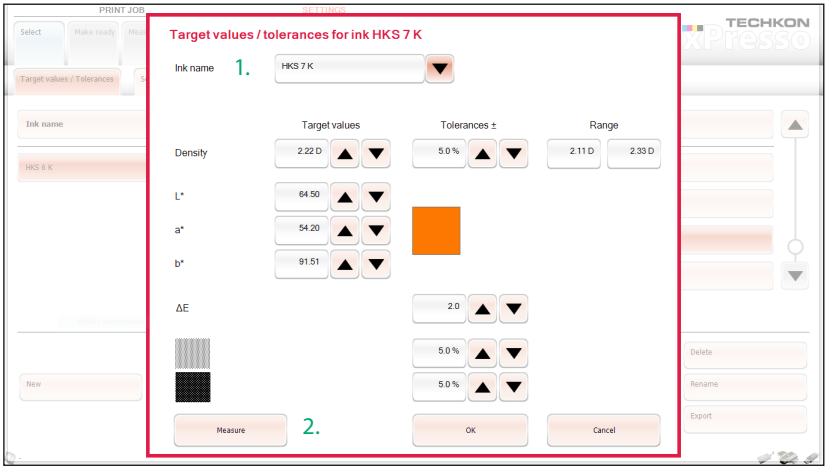
- Click on the **New** button (1.) in the right menu section below the already listed target values. A new window opens where you can enter the name of the new target set you want to generate. Confirm the process with **OK**. The new target set will appear in the list of the already defined target sets in the menu window (2.), but it does not yet contain colors.



- Now click on the **New** button, which you find on the lower left side of the menu window. The window **Target values / tolerances for ink** appears.

- Choose from the pull-down-menu the **Ink name** (1.) of a color, which you have already defined in **Settings → Printing conditions → Inks** (see p. 25).

- Additionally you can change the target values and tolerances of this color manually by editing the text boxes or take the measurement data of SpectroDrive by pressing the **Measure** button (2.).

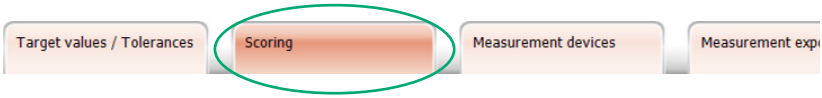


- Confirm the color and eventually set changes with **OK**. Now the color appears in the left section of the menu window and is added to the new target set.

- Thus proceed with all the colors which you want to add to a target set.

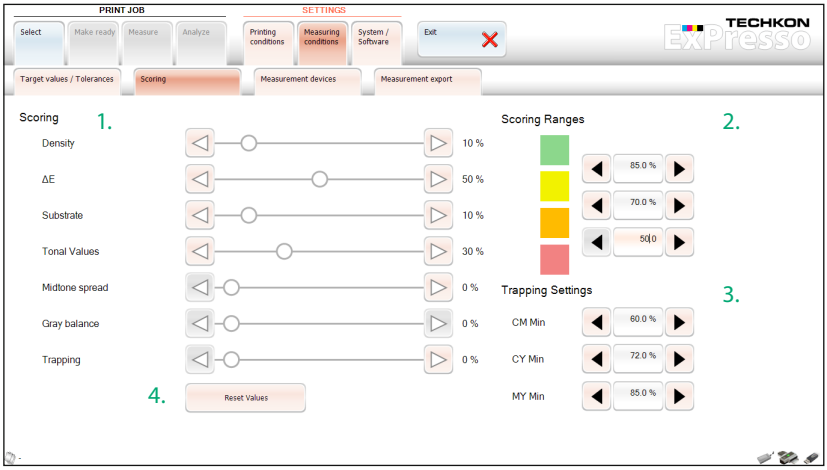
- Already existing target sets can be duplicated, renamed, imported and exported by using the buttons in the lower right section of the **Target values / Tolerances window** (see picture on p. 29). The target sets of the ISO values can not be deleted.

Measuring conditions – Scoring



In this menu section the defaults are set, to which the scoring of a measurement refers to.

The menu window is divided into three sections: **Scoring** (1.), **Scoring Ranges** (2.) and **Trapping Settings** (3.).



Individual, customer-specific settings can be made by moving the sliders. The total amount of all sliders is always 100 %. Therefore the sliders are linked with each other and should be set starting at the top of the **Scoring** section going downward step-by-step.

By clicking on the arrow symbols, which are located on the left and the right side of a slider, an exact gradual change of the numerical values is possible – for integral numbers by 1 % steps, for decimal places by 0,1 % steps.

The section **Scoring** allows to set parameters which are essential for printing, like for example density, ΔE, substrate and trapping.

The sliders can be reset to their initial position quickly and completely by using the button **Reset values** (4.).

The **Scoring button** which appears in the ExPresso menu after a measurement has been carried out shows one of four different colors. In the section **Scoring Ranges** the ranges for these four colors are defined. Green indicates a good measurement result. Its minimum value is set in percent using the edit field at the top of the row. In the same way going down the input fields the yellow and the orange range get their percent values. The red color represents all values which are below the minimal value of the orange range. Common user settings are: (Green>) 85 %, (Yellow>) 70 % and (Orange>) 50 %.

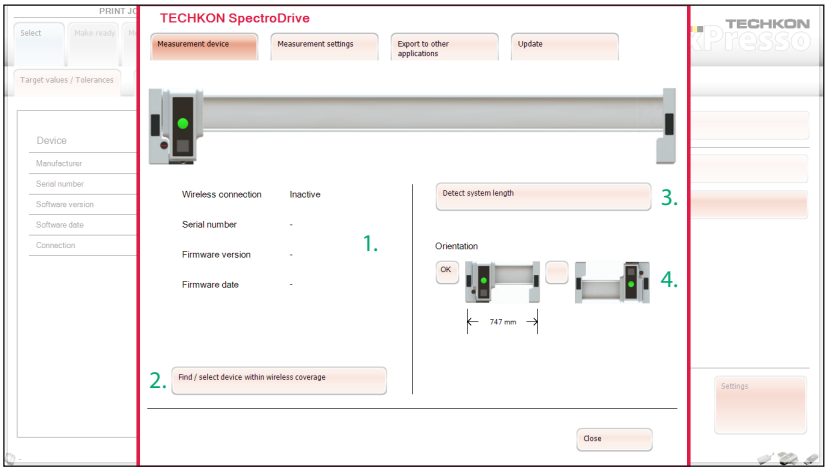
In the section **Trapping Settings** the minimum values for trapping are set; from 0,1 % to 100 %.

There are no standard values for the trapping measurement. The values which can be obtained depend on the printing process and particularly on the type of ink and paper used. Typical values for standardized print with Paper Class 1 (glossy, coated) are: C+M > 60 %, M+Y > 72 % and C+Y > 85 %.

Measuring conditions – Measurement devices

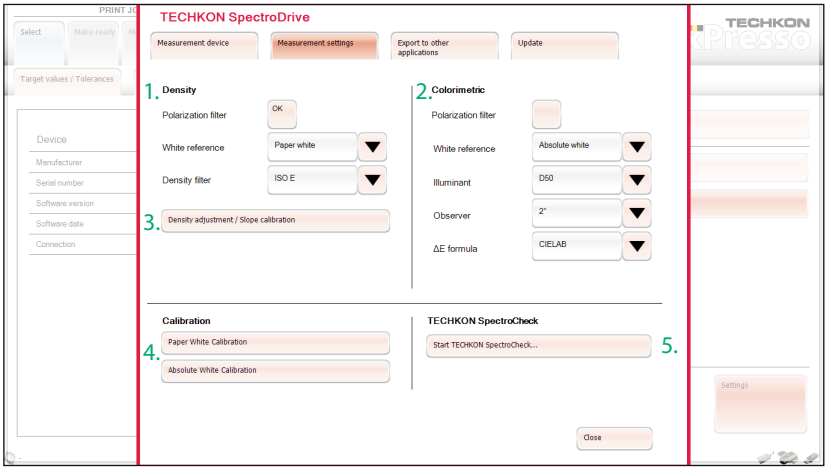
The types of measurement devices which can be connected to the ExPresso software are shown. When you have chosen the type of device you wish to connect, an information window is displayed at the left side of the window. Here you get further information about the actual device and the connection status.

By clicking on the **Settings** button in the right lower corner, of the Measurement devices menu, the window **TECHKON SpectroDrive** opens, which is divided into four sections and offers basic settings options.



The **Measurement device** window shows all relevant information concerning the connected device (1.). If there is more than one TECHKON measurement device within the wireless coverage, you can choose the device you wish to use with **Find / select device within wireless coverage** (2.). If you changed the horizontal track, detect the system length (3.) and define the orientation of the measurement device (4.) by using the appropriate buttons in the right section of the window.

Measurement settings



In **Measurement settings** the fundamental settings for density- (1.) and colorimetric-measurements (2.) are displayed.
The standard pre-settings for density measurement are

- for Europe: polarization filter on, white reference is paper white, density filter is ISO E,
- for the USA: no polarization filter, white reference is absolute white, density filter is status T.

You can use the **Density adjustment / Slope calibration** (3.) function, to adjust the measurement device to the density measurement data of other devices.

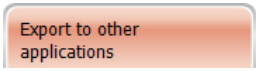
- Select the window **Density adjustment / Slope calibration** and follow the instructions. First you have to carry out a paper white calibration on the paper patch of a calibration chart (which is optionally available). Then the reference values of the calibration chart have to be entered into the text boxes of the process colors. Now the color patches (CMYK) of the calibration chart have to be measured. A green checkmark confirms that the measurement was carried out successfully. The new density adjustment is saved with **OK**. If the procedure is cancelled or the **Reset slope values** function activated, the device will be reset into its factory-made state.

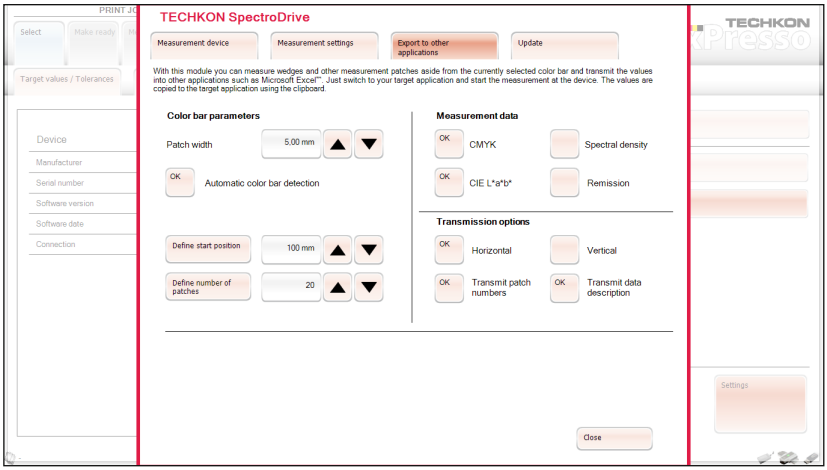
The pre-settings for colorimetric measurements are: polarization filter off, white reference is absolute white, measurement condition M0, illuminant is D50, observer is 2° and ΔE formula is CIELAB. One can choose other standards by clicking on the pull-down-menu if required.

The buttons **Paper white calibration** and **Absolute white calibration** (4. on p. 34) start the corresponding calibration. The **Absolute white calibration** function is only available when the device stands on the track in the home position. After a calibration has been carried out properly, it will be confirmed by the information window.

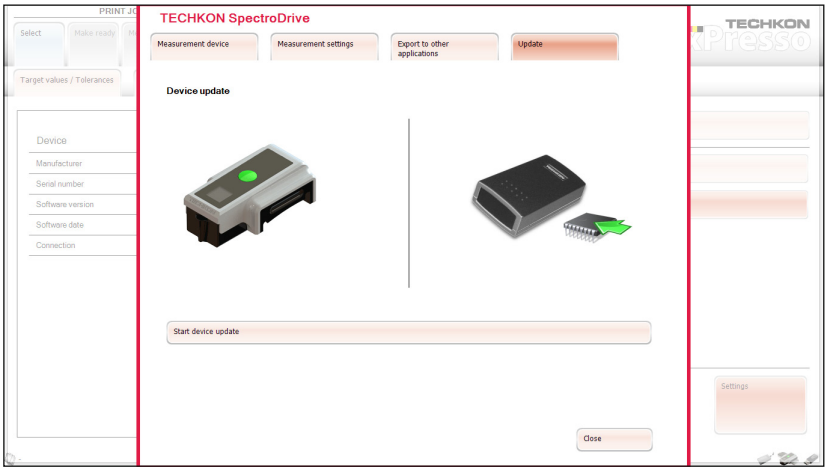
TECHKON SpectroCheck (optionally available) is a color reference used to check the measuring accuracy of the SpectroDrive device.

Connect SpectroCheck via the USB cable with the computer. Then place SpectroDrive on the SpectroCheck console. Press the button **Start TECHKON SpectroCheck...** (5. on p. 34). The program will now lead step by step through the check procedure of SpectroDrive. Green checkmarks confirm that the device conforms with the technical specifications. A final report can be printed as well.





With this module you can measure wedges and other measurement patches aside from the currently selected color bar and transmit the values into other applications such as Microsoft Excel™. Just switch to your target application and start the measurement at the device. The values are copied to the target application using the clipboard.



The button **Start device update** (1.) establishes the connection to the hard disk level of the PC and enables the choice of the directory, in which the update file is located.

You can download the latest firmware for you device free of charge in the internet: **www.techkon.com → Support → Download area → SpectroDrive → TECHKON SpectroDrive Firmware**. The firmware version of the connected SpectroDrive can be seen in the information window **Measurement device**.

There is no access to the settings windows described on page 33 – 36, when in **Settings → Measuring conditions → Measurement devices** SpectroDrive Simulator is selected. The simulator is a virtual measurement device which can be used for tests and demonstrations when no real hardware device is connected. The **SpectroDrive Simulator** will also be used when no software protection key (dongle) is connected and the software runs in demo mode.

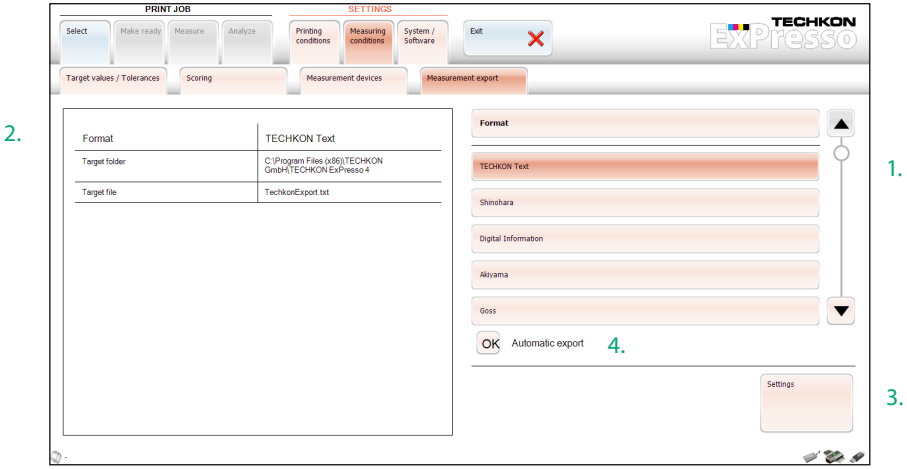
Measuring conditions – Measurement export

After each measurement, the values can be exported to other applications. The most popular export formats e. g. CSV (Microsoft Excel™) are already pre-installed (1.).

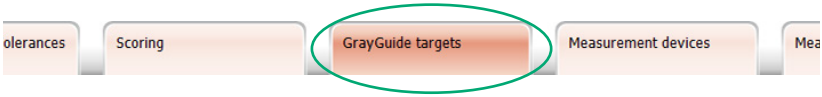
In the left section of the window further information about the target file and the target folder are displayed (2.).

The button **Settings** (3.) opens a window headed by the name of the selected export format. Here you can edit format specific settings. For example in **Digital Information Export** you can choose between text- and the JDF-format.

For all export formats the option **Automatic export** (4.) can be activated.

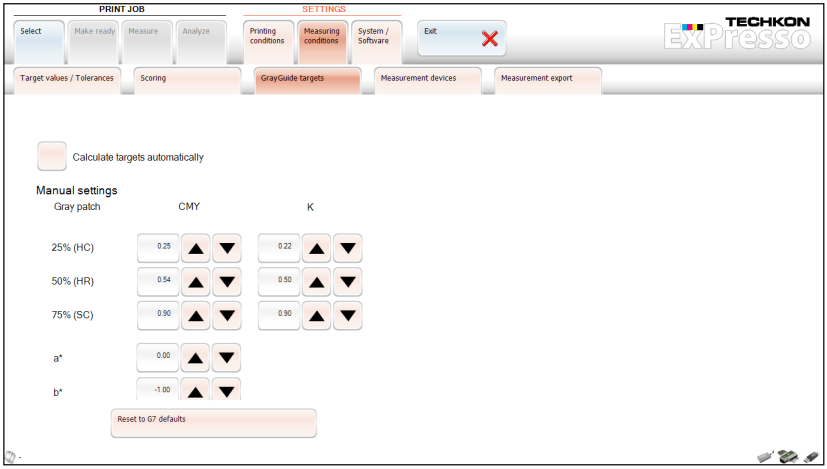


Measuring conditions – GrayGuide targets

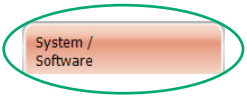


If in **Settings → System / Software** the option Gracol G7™ was selected to be the preferred Gray mode display (see picture p. 39), **Settings → Measuring conditions → GrayGuide targets** opens now a menu window, which allows to adjust the target values or let them be calculated automatically.

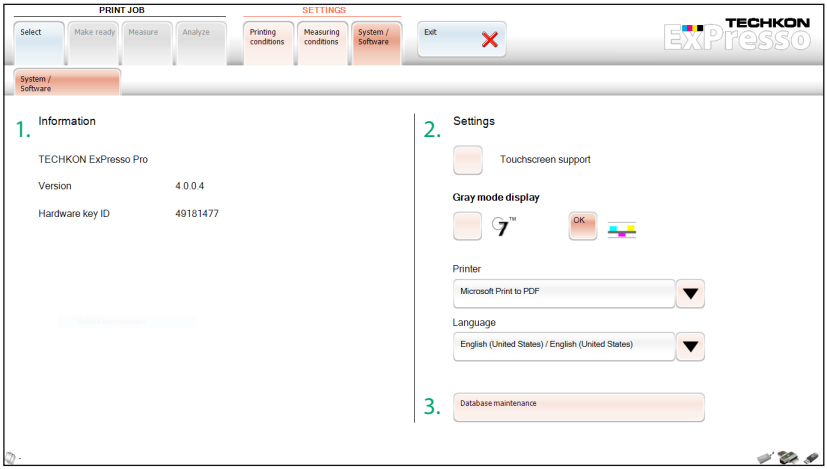
Gray patches as well as the hue (a*b*) for the paper white can be edited. If required all values can be reset to the G7™ defaults.



The following settings can be made in the System / Software section:



The menu item is divided into the two sections **Information** (1.) and **Settings** (2.).



Information:
Displays the type of software (ExPresso Basic or Pro), the software version, the dongle-ID, the expiration date of time-limited dongles, and if extension modules are installed.

Settings:

- Touchscreen support: Must be active, when a touch-sensitive screen is connected, to provide a virtual keyboard for the text input.

- Gray mode display: This selection defines, whether the analysis of the gray balance shall be carried out densitometrically or according to Gracol G7™.

- Printer: Defines the connected printer for printing the report.

- Language: Sets the language.

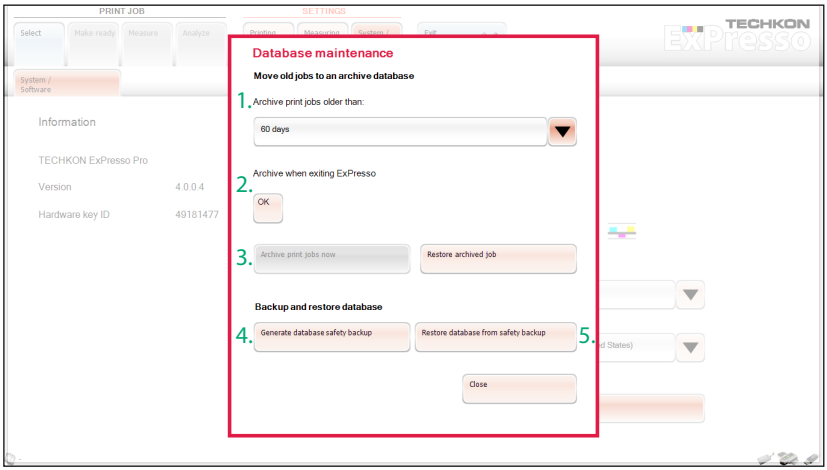
The button **Database maintenance** (3. in picture p. 39) opens a new window, where one can decide, after which period of time the print jobs will be archived (1.).

The option **Archive when exiting ExPresso** can also be selected (2.).

Furthermore older print jobs can be archived instantly by a push of a button and in the same way already archived print jobs can be restored (3.).

The database is located on the hard disk of the PC in the ExPresso directory. When **Generate database safety backup** (4.) is selected, the existing database will be saved under a given name.

If required the stored database can be restored using the included restore tool (5.). You have to quit ExPresso for this procedure and start it again after the database has been restored. **Restoring** of the database leads to an overwriting of the recently saved data in ExPresso.



3.5 Defining and running a print job

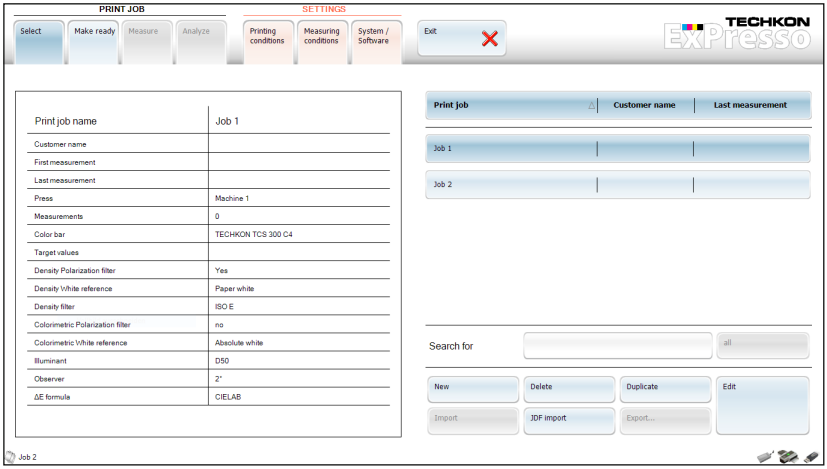
Before running a print job, certain selections have to be made. Everything related with a **Print job** is indicated by the blue screen color.

ExPresso has an "autosave" function. Every Print job will be saved automatically. This applies also for Print jobs which are not completed and will be resumed later.

Select

The list (1.) contains **Print jobs** which have been already made. A Print job can be stopped at any time and resumed later.

An information box (2.) on the left side of the menu window shows at a glance the most relevant informations: customer name, date and time stamp of the first and last measurement, press, number of the measurements, the selected color bars (for the top side as well as for the reverse side) and the most relevant measurement parameter.



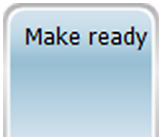
The **Search for** function supports the fast research for already existing print jobs.

Clicking in the **Edit** button (3. in picture p. 41) provides a direct access to the submenu **Print job → Make ready → Print job info**.

TIP: New print jobs similar to old print jobs, can be set up by duplicating. Thus time is saved, because settings can be taken over.

By using the duplication function also OK-sheets can be taken over for repeated print jobs.

Make ready



Certain selections have to be made, before the measurements can be started.

Make ready – Print job info

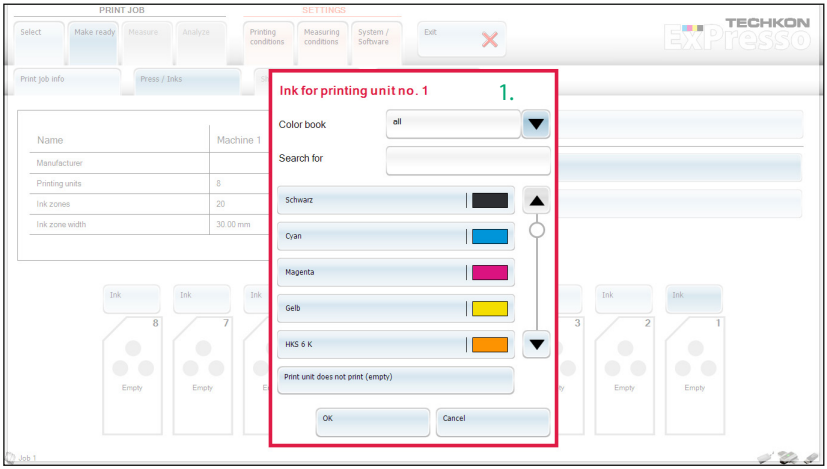
Textual information about the print job can be edited in **Print job info**.

The text entered in **Print job name** will be the title of the data set, which will be automatically saved by ExPresso. It can be selected from the **Print job → Select** menu. During measurements it will be shown in the lower left section of the status bar.

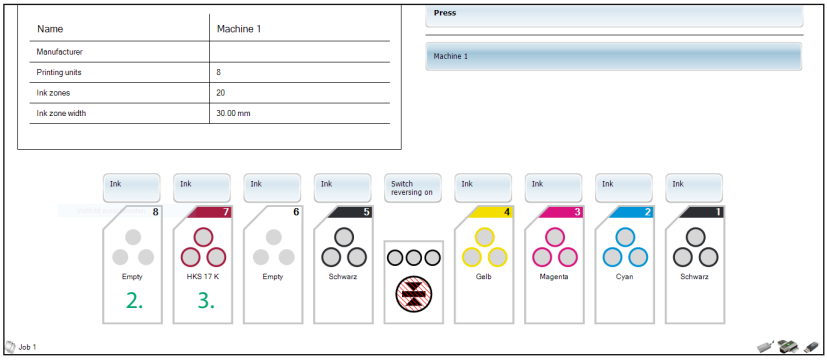
The section **Customer name** and a text box for detailed **Remarks** concerning the print job can be used optionally.

Make ready – Press / Inks

Select a press, which you have already defined in **Settings → Measuring conditions → Presses** (see p. 22 and 25) and fill the printing units virtually with ink (1.).



An inking unit can be kept empty as well (2.). For example, if a 6-color press is used only for CMYK-print, the last two printing units can remain empty.



The picture on page 43 shows an 8-color press, with two empty printing units. Printing unit no. 7 contains the spot color HKS 17 K (3.), what can be seen at a glance by the screen color and the color name on the printing unit.

TIP: The virtual filling of the press with ink is not necessary, when an already existing print job with the same press configuration is selected in **Print job → Select** and duplicated.

Make ready – Sheet / Color bar

As soon as the press is filled with ink choosing **Print job → Make ready → Press / Inks**, the menu item **Sheet / Color bar** is unlocked and selectable.

1. On the left side of the window a **Color bar** can be selected, after having been defined or pre-installed in **Settings → Printing conditions → Color bar** (see p. 27 f.).

If a color bar is selected, whose ink zone width differs from the ink zone width of the selected press, a warning is displayed.

If the selected color bar does not contain a paper white patch, a paper white calibration has to be carried out manually, before the function **Scan color bar length** can be used.

The green arrow located left from **Scan color bar length** indicates that the color bar has to be measured. By pressing the green measurement button (2. in picture p. 44), SpectroDrive scans the printing sheet an sets the length of the color bar. The green arrow disappears, if a color bar length has been scanned and captured successfully.

As a default, the color bar will be centrally aligned. Additionally the ink zone for the first measurement can be defined individually. Use the arrow buttons of the **Starts in ink zone** function to define which ink zone of the press will correspond with the first zone of the color bar (1.).

The selected connection between the color bar and the ink zones of the printing press is also shown graphically (2.).

If no color bar has been detected, an information window appears (3.) which reminds the user to position the color bar accurately and to repeat the measurement.

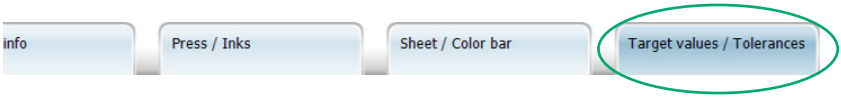
If a printing press with a reversing unit has been defined, there will be a measurement section for the **top side** as well as one for the **reverse side**. This provides the possibility to capture two different color bars for top- and reverse-printing.

The button **Change plate assignment** (4. on p. 45) opens a new window, where the assignment of a printing plate in regard to a printing unit can be defined individually.

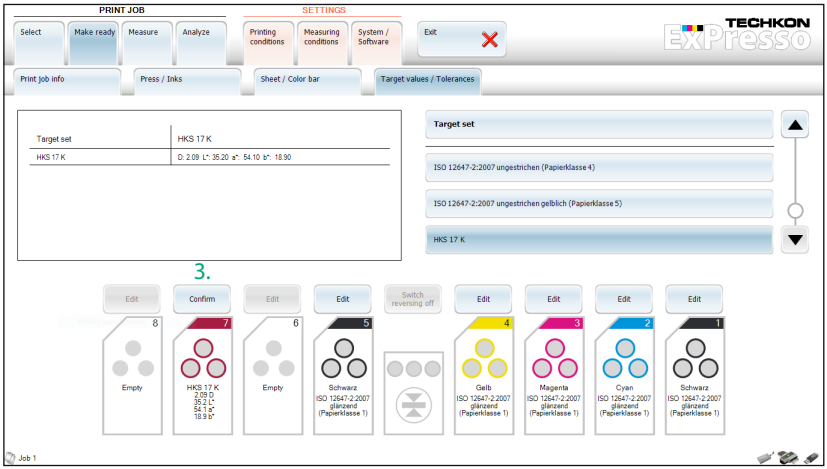
A change of the plate assignment is always necessary, when the order of the inks has been changed or if spot colors are used.

In the following example it has been necessary to assign the ink Magenta (1.) to the spot color HKS 17 K in printing unit no. 7. Thus the color bar will feature a measurement patch at the right position, which guarantees a proper measurement and analyze of the color bar.

Make ready – Target values / Tolerances

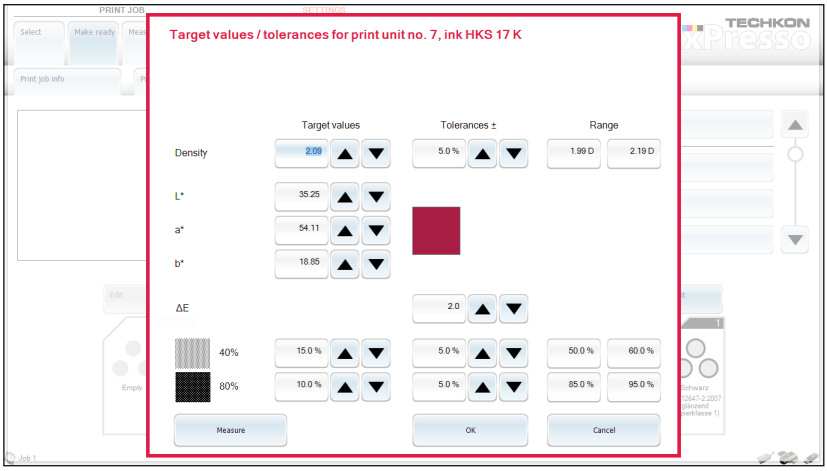


As the printing units have been filled with ink, now they are assigned with target and tolerance values; preferably tolerance sets according to the printing standard ISO 12647-2:2007 for the paper classes 1 – 5, which are already pre-installed.
When using scan-measurement-devices of the newer generation which support the requirement of ISO 13655 including the measurement conditions M0 to M3, the default values according to ISO 12647-2: 2013 can be selected as well.



Besides the already pre-installed target sets for the five paper classes (1.), the list can also contain individual target sets (2.), which have been already edited using **Settings → Measuring conditions → Target values / Tolerances** (see p. 29 f.). The information box on the left side of the menu window shows all colors which belong to a target set and their target values.

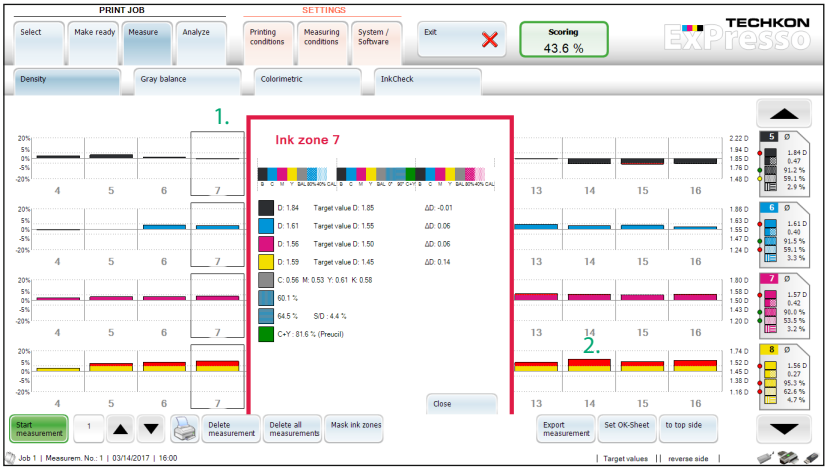
Individual target values and admissible tolerances can be edited and measured for each printing unit. When a target set has been confirmed, just click on the button above the printing unit (3.). It changes into an **Edit** button, which opens the following window:



Measurement of a print job

Measure – Density

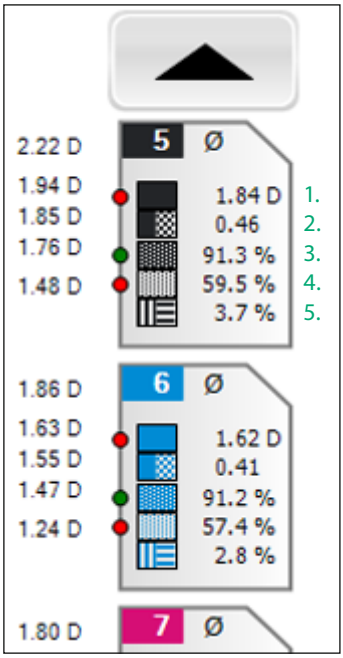
This screen will display all relevant information after a scan measurement. The scan measurement can be started by pressing either the green measurement button on the device or the **Start measurement** button in the left lower section of the screen.



1. Detailed information for every ink zone by pointing on the bar graph.

2. Measurement values out of tolerance will be marked with red top.

3. This section displays in detail the average values of the measurement parameters of the single printing units.

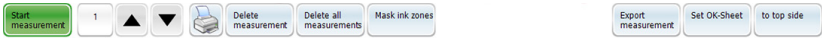


The info section of the menu item density measurement shows in detail the following parameters:
1. Solid density
2. Printing contrast
3. Dot area 80 %
4. Dot area 40 %
5. Slur / doubling factor

In the measurement menus **Colorimetric** and **InkCheck** the relevant parameters for these measurements are displayed.

Red, yellow and green dots, located ahead of the average values, show fundamental problems. Green dots indicate values within the tolerance. Red dots show values out of tolerance. Values close to the tolerance limit (75 %) are marked by yellow dots.

Structure of the command line



On the basis of the command line of the menu section **Print job → Measure → Density** all command options will be explained. The order and the availability of the particular command options can vary in the different measurement menus, but they have always the same effect.

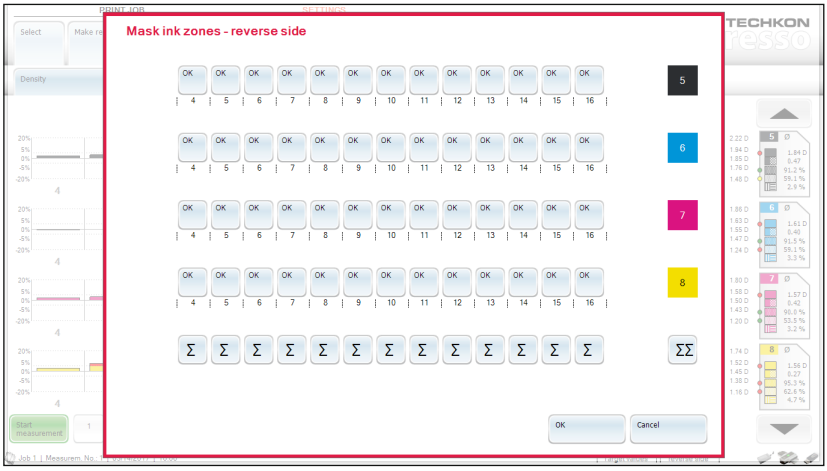
1. The green button starts a measurement.

2. The white patch shows after each measurement automatically the number of this measurement. Using the arrow buttons one can navigate through the already made measurements of a print job.

3. Clicking on the button with the printer icon opens the connection to the printer, which has been already defined in **Settings → System / Software**. The printer option allows to print out the displayed window.

4. These buttons can optionally delete the current measurement or all measurements of a print job.

5. The button **Mask ink zones** opens a window, where optionally single inks within the ink zones or complete ink zones can be masked. Please note that the masked ink zones will not be taken into account for the calculation of the report statistics.



6. **Export measurement** starts the export into another application (see p. 37).

7. **Set OK-sheet**, defines the OK-sheet, which is set instead of the target set. When setting the OK-sheet, it will be numbered to the corresponding measurement and will be displayed in the lower status line. Now the button switches to **Delete OK-Sheet** and serves for this function.

8. **To top side** respectively **to reverse side** switches between top- and reverse-printing, if a press with a reversing after a printing unit has been selected.

Measure – Gray balance (densitometric)

When making a measurement on a gray balance patch, the referring density values for the process colors (without K) are shown in a bar graph. The values for Cyan, Magenta and Yellow should be in close range to each other to ensure a neutral gray balance without a color hue.

It is important that the gray balance patch, on which the measurement is taken, comprises the right %-values to achieve a neutral gray when printed correctly.
The process standard ISO 12647 for offset print defines the values as:
C = 50 %, M = 40 % and Y = 40 %.

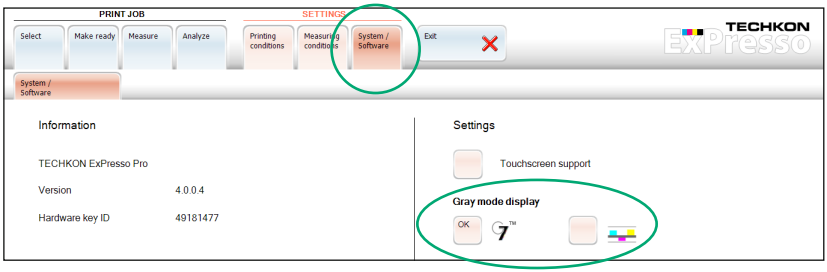
The color bars TECHKON TCS Digital include a gray balance patch compliant with ISO 12647 in every ink zone. The gray balance display will show densitometric gray balance values for CMY in a bar graph.

At a glance there can be diagnosed, if the overprint of CMY is a neutral gray or if it has a color cast (1.).

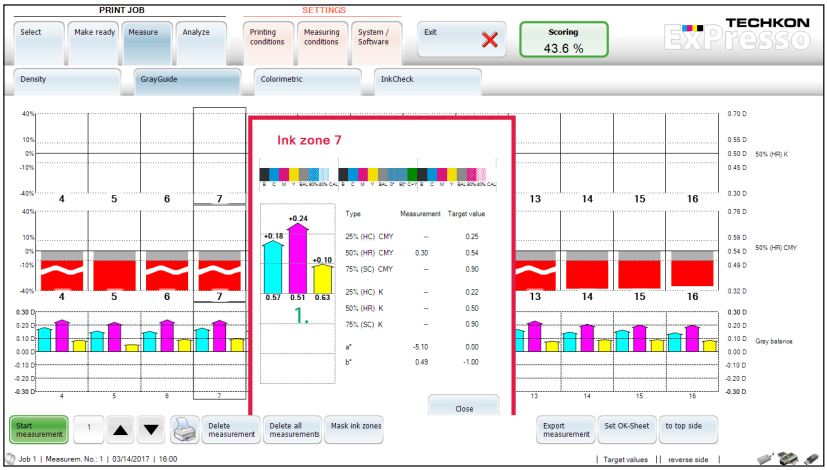
Measure – GrayGuide (according to Gracol G7™)

The GrayGuide function is a very useful feature when controlling a printing press according to the Gracol G7™ method, which is especially common in the USA. It requires the use of an appropriate color bar.

1. **G7™** has to be selected in the section **Gray mode display** in **Settings → System / Software,** to make the GrayGuide function available in the menu bar.



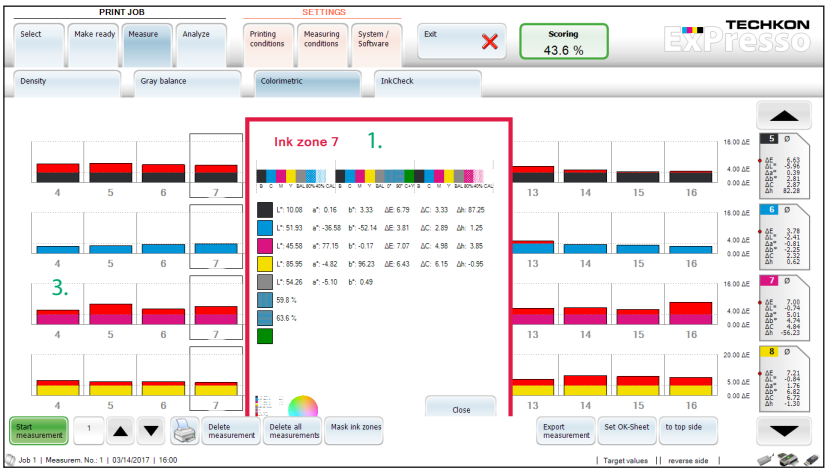
In the following example the adjustment recommendation (1.) shows, that all of the three inks CMY have to be increased to match the Gracol targets.



Measure – Colorimetric (ExPresso Pro)

Thanks to the spectral performance of SpectroDrive it is possible to calculate and display colorimetric values as well. Measurements in colorimetry modes have the advantage of an absolute description of color based on characteristic values. So it is possible to measure spot colors as well.

Colorimetric measurements refer in most cases to the most popular color system in the printing industry: the CIE L*a*b* color space. The color distance ΔE describes how close two colors match. A value of 0 means that two colors are identical.
It can be defined in the **Measurement settings** (see p. 34) according to which ΔE formula the color distance is calculated by ExPresso.

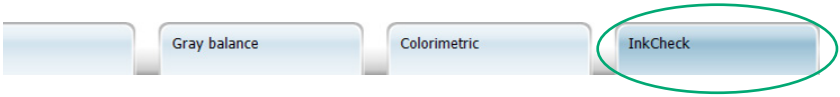


1. Detailed information for every ink zone by pointing on the bar graph.

2. Average values for all ink zones.

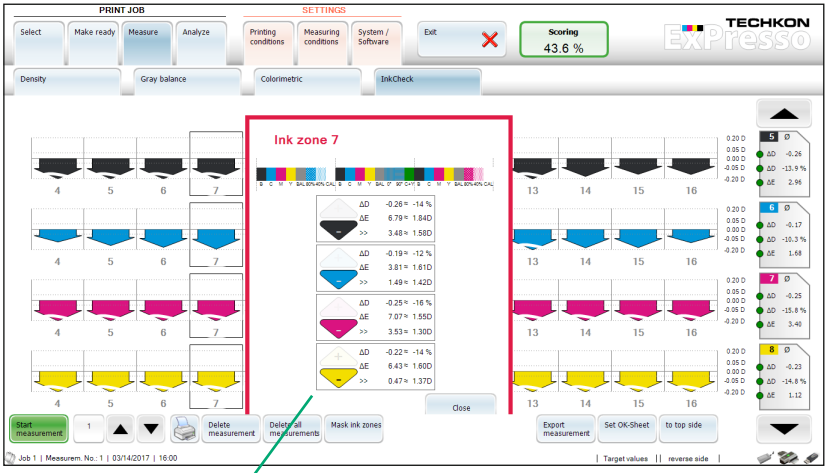
3. Measurement values out of tolerance will be marked with red top.

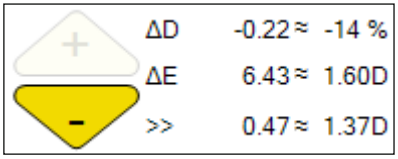
Measure – InkCheck (ExPresso Pro)



Densitometric values are a direct measure for the ink applied on the paper. They are very process-related, although they are relative values only. Colorimetric values as recommended in print standard ISO 12647 are absolute values, but they are not suited to use them for handling the printing process.

Thanks to the spectral measurement technology of SpectroDrive, the very useful **InkCheck** function combines the best of both worlds: Spectrally based recommendations how to set the ink keys as used from density in order to meet colorimetric targets required for printing within ISO standards.



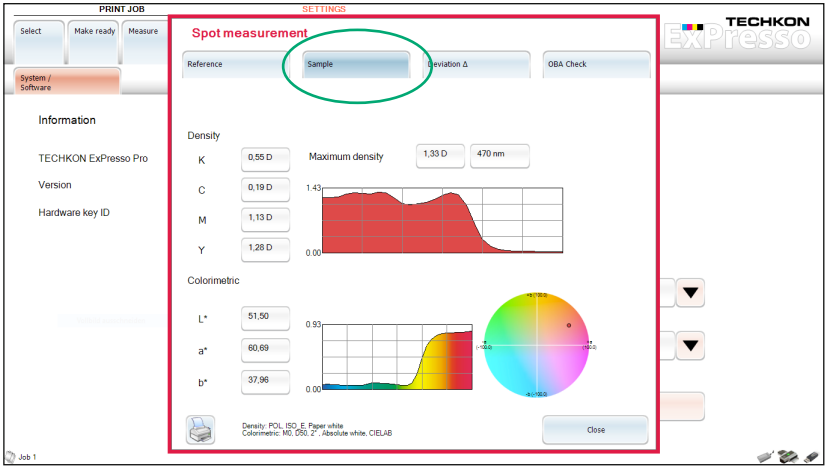


In this case there is too much yellow ink applied in ink zone 7. In order to achieve a lower ΔE, the density has to be reduced by 0,22 from D=1,60 to D=1,37. That reduces ΔE from 6,43 to 0,47.

Spot measurement

To carry out a spot measurements just position the SpectroDrive device with the measurement head on a single measurement patch and press the green measurement button shortly. The measurement data are instantly displayed by the ExPresso software in the window **Spot measurement** in the submenu **Sample**.

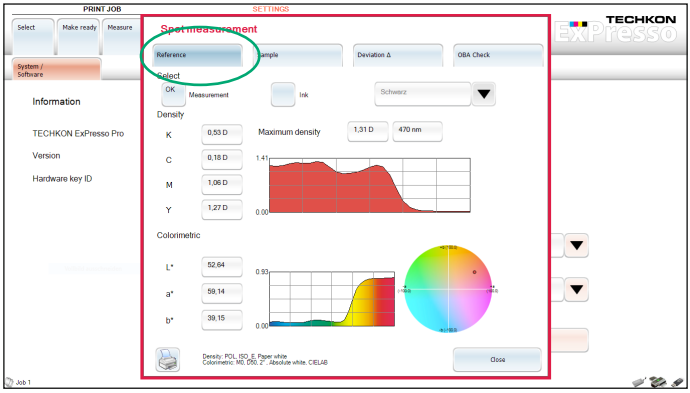
All relevant density- and colorimetric-values are shown here very clearly and can therefore be interpreted at a glance. The maximum density according to the wave length is displayed as well.



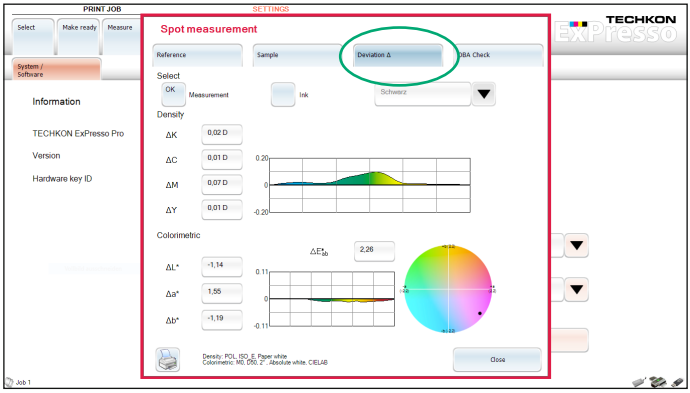
In the menu **Spot measurement → Reference** (see p. 56) a reference can be selected for the measured color. This can be a second measurement or an already defined ink (see p. 25).

The window **Spot measurement → Deviation Δ** (see p. 56) displays the deviation of the measurement values of the sample to the selected reference. The densitometric and colorimetric numerical values are supplemented by a graph.

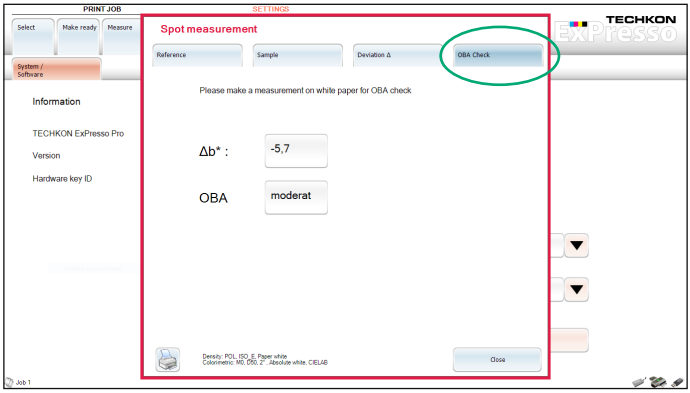
The section **Spot measurement → OBA-Check** (see p. 56) provides exact informationen about the intensity of the optical brightening agents used and shows the hue of the paper.



Spot measurement Reference



Spot measurement Deviation Δ



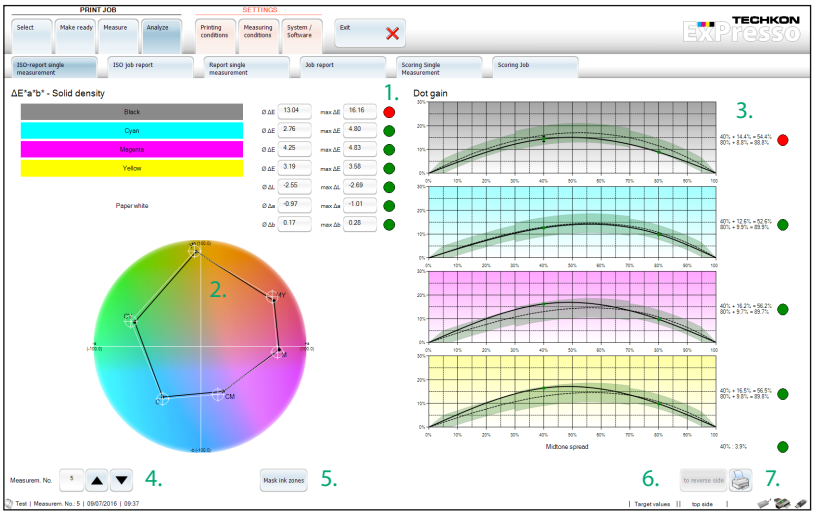
Spot measurement OBA-Check

Analyze

The functions in the **Analyze** menu serve to analyze single measurements or complete series of measurements (print jobs).

Single measurement report and **Job report** are used in regard to individually defined target sets and tolerances. **ISO-report single measurement** and **ISO job report** include additionally the compliance with target sets and tolerances according to the international standard for the printing process control ISO 12647. The resulting evaluations of the different analyses can also be printed out in so called reports.

Analyze – ISO-report single measurement (ExPresso Pro)

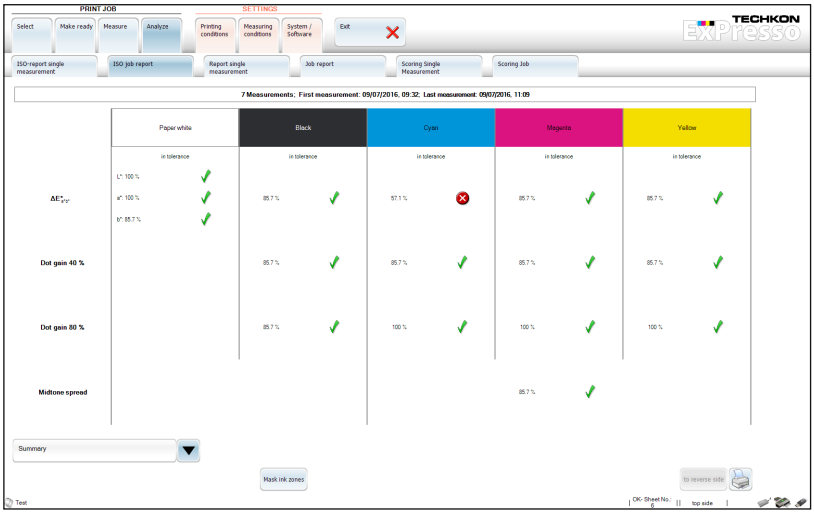


ISO-report single measurement includes two sections: ΔE*a*b*-solid density and dot gain. The dot gain is documented for 40 % and 80 % and the midtone spread is visualized graphically.

1. Green dots indicate that the values are within tolerance
2. Display of the color gamut
3. Tonal % curves
4. Selection of measurement to be analyzed
5. Function **Mask ink zone** (see p. 50)
6. Switch between top side and reverse side (if available)
7. Prints reports

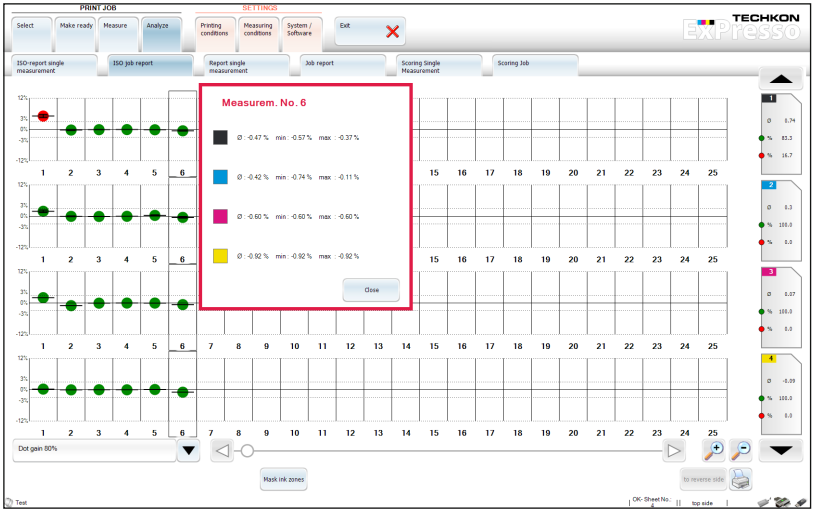
Analyze – ISO job report (ExPresso Pro)

The job report according to the ISO standard allows the documentation of the whole printing process during the entire print job. You can choose between a summary (1.) and the display of detailed reports of single parameters, which you can select from the pull-down-window in the lower left corner of the menu window.

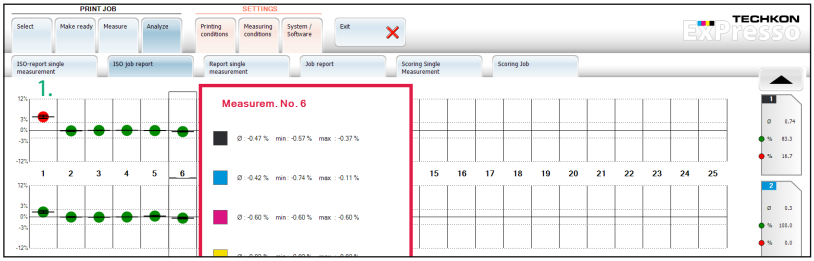


1.

Window: with detailed information **ISO job report** for ΔE and selected measurement no. 6:



A green dot indicates, that the measurement value meets the tolerance.



The example shows a red dot in the measurement series no. 1 (1.), which signalizes a measurement value which is out of tolerance. This is also indicated by the fact that the position of the dot is far above the base line.

The variation within a sheet is described by a vertical line within the dot. The heavier the variation, the longer the vertical line.

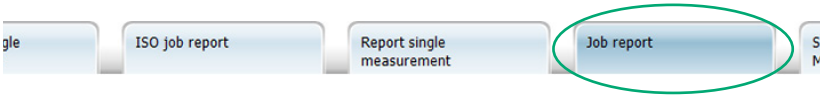
Using the button **Mask ink zones** in the lower part of the menu window (see p. 58) you will switch to the **Mask ink zones** function. Here you can define which OK-sheet will be the starting point for the evaluation of the print job. Optionally a measurement can be selected to serve as starting point. This function is available for the top side as well as for the reverse side.

Analyze – Single measurement report

Single measurement report can be compared with **ISO-report single measurement**, but the evaluation does not refer to the ISO standard. Therefore the information sections **Solid density** and **Dot gain** refer only to individually defined target sets and tolerances.

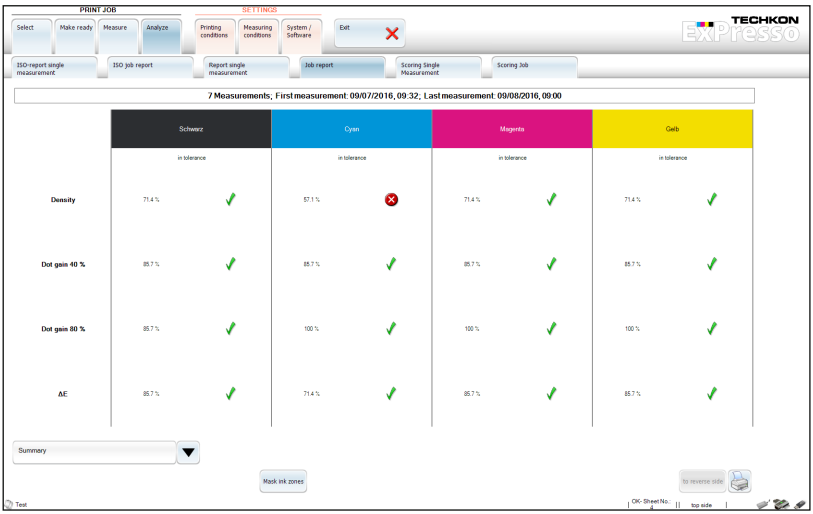
Up to eight colors can be displayed, e. g. CMYK and four spot colors.

Analyze – Job report



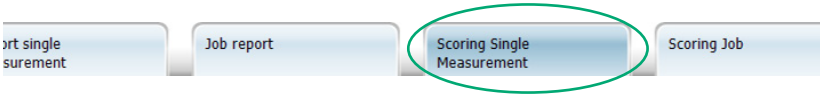
Job report is an evaluation of the whole print job in regard to the target values and tolerances according to customer standards.

You can choose between a summary (see the picture below) and the display of single parameters e. g. dot gain 40 %, dot gain 80 %, slur / doubling, contrast and ΔE (ExPresso Pro only), which you select by clicking in the pull-down-menu in the lower left corner of the menu window (1.).



1.

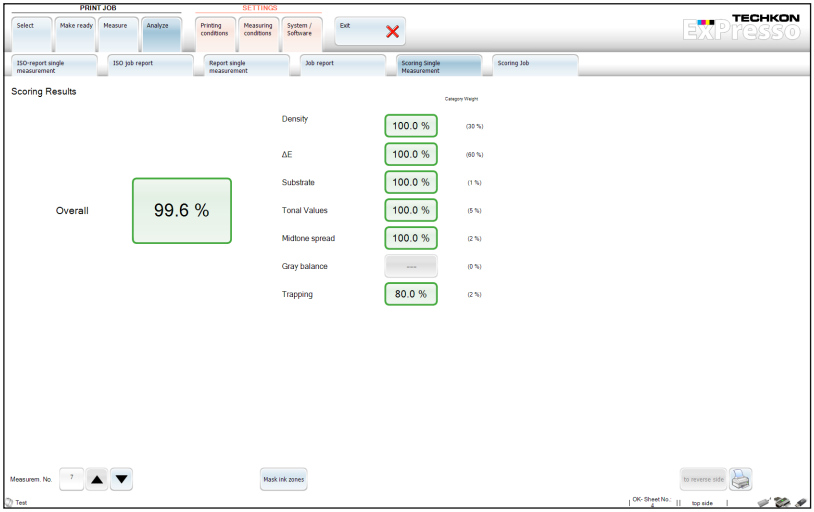
Analyze – Single measurement report



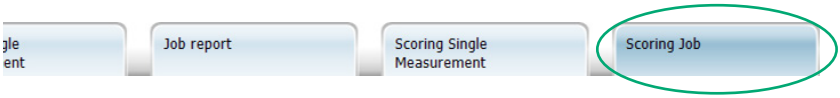
As soon as the menu **Measure** is active, the button **Scoring** appears in the menu bar, showing the total scoring result of a measurement in percent. After a double click on this button, the menu sublayer **Scoring Single Measurement** opens directly. You can reach this sublayer also by choosing **Print Job → Analyze → Scoring Single Measurement**.

Here not only the total scoring result is displayed but also detailed scoring results of the single measurement parameters like for example density, ΔE, substrate and trapping. Each detail result is displayed together with its respective weighting, which was defined in the sublayer **Settings → Measuring Conditions → Scoring**. Thus an overall rating of a measurement is possible.

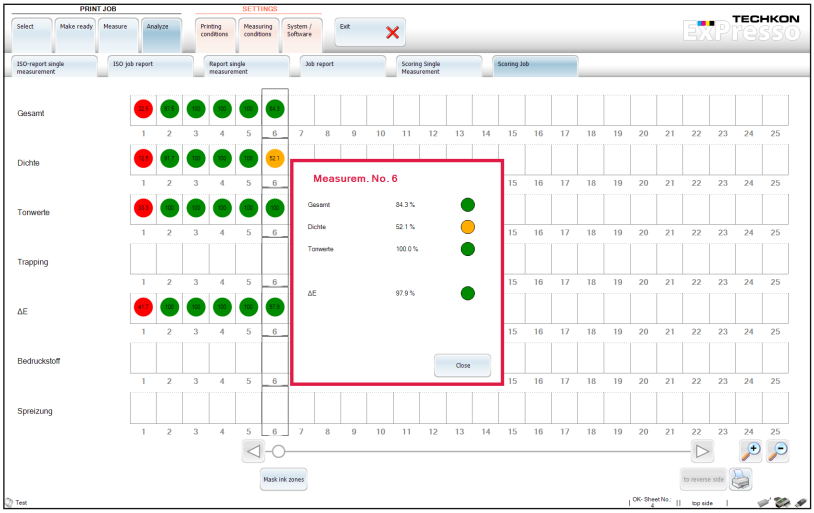
When the button **Mask ink zones** in the lower part of the window is used, another window opens which allows (as described on page 50) to hide single ink zones specifically.



Analyze – Scoring Job



Comparable to the scoring analysis of single measurements (see p. 62) this menu section displays the scoring results of a job in detail.



Exit

Just press the **Exit** button to quit the ExPresso application. A window for confirmation will appear.

There is no need to actively save a **Print job** or settings made since ExPresso has an "autosave" functionality, all data is securely stored already.

Chapter 4

How to use the Windows software SpectroConnect

4.1 Software description

The supplied Windows Software SpectroConnect allows to transfer measurement data to the PC and to make device specific settings from 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™.

The software requires a computer with two free USB ports and a completely installed Microsoft System Windows 7, 8 or 10.

4.2 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 WLAN-module for wireless data transmission is **NOT** connected to the PC.

   Insert the CD containing the SpectroConnect software into the CD drive of the running computer.

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

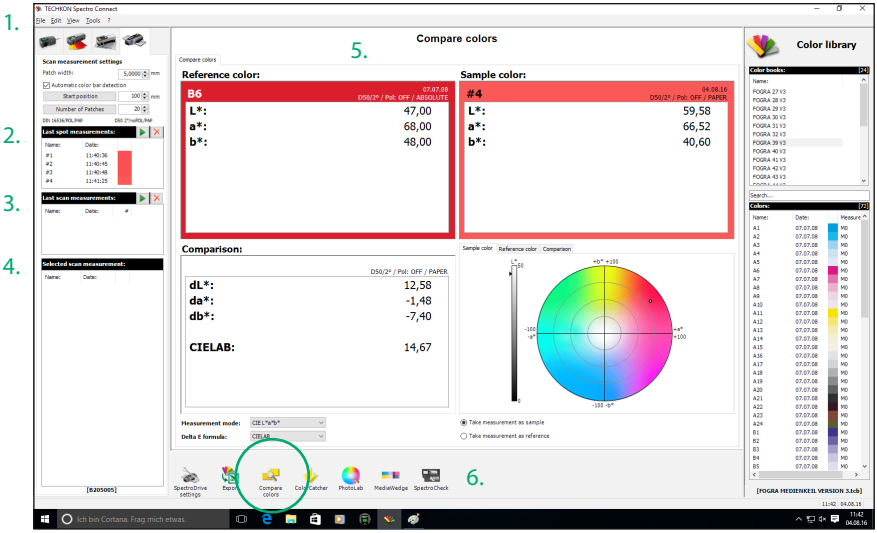
3. Now, after the installation was finished successfully you can connect the WLAN-module with the USB cable to the computer.

Software-Symbol SpectroConnect

4.3 Overview / Software module: Compare colors

The application will be installed in the Windows program files section in the folder **TECHKON GmbH / TECHKON SpectroConnect**.

After starting the program the main screen **Compare colors** will appear. It is divided into four logical segments: On the left side you see the scan measurement settings and already carried out spot and scan measurements 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 **Last spot measurements** shows the last spot measurements carried out.

3. The window **Last scan measurements** shows the last scan measurements carried out.

4. **Selected scan measurement**: the whole information of a selected measurement will be displayed in the middle of the screen (5.).

5. Window of the active program module.

6. 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.

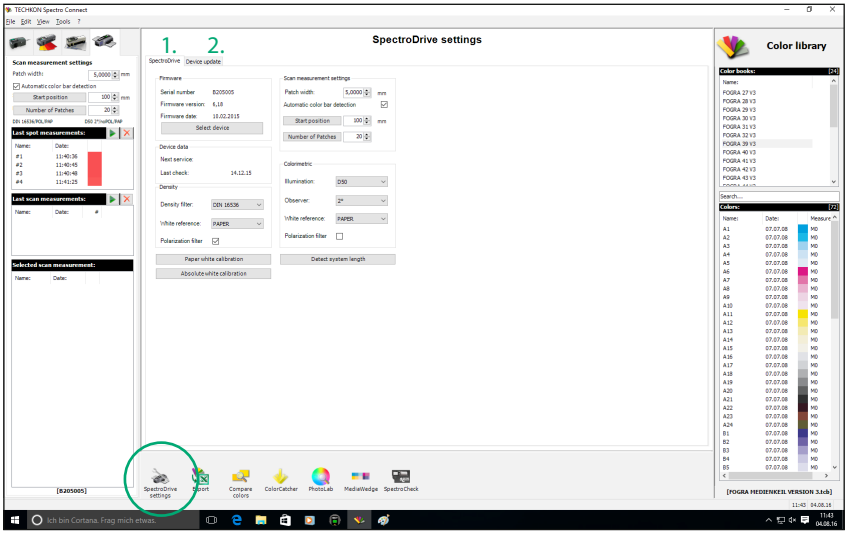
After launching SpectroConnect it is pre-set to display the module **Compare colors**.

4.4 Software module: SpectroDrive settings

In this module device specific settings can be made.

1. SpectroDrive: All settings concerning the SpectroDrive device can be carried out with this software feature. The Serial number of the device and the installed Firmware version as well as the Firmware date are displayed. The software module **SpectroDrive settings** is very convenient for choosing density and colorimetric settings and according references as well as scan measurement settings.

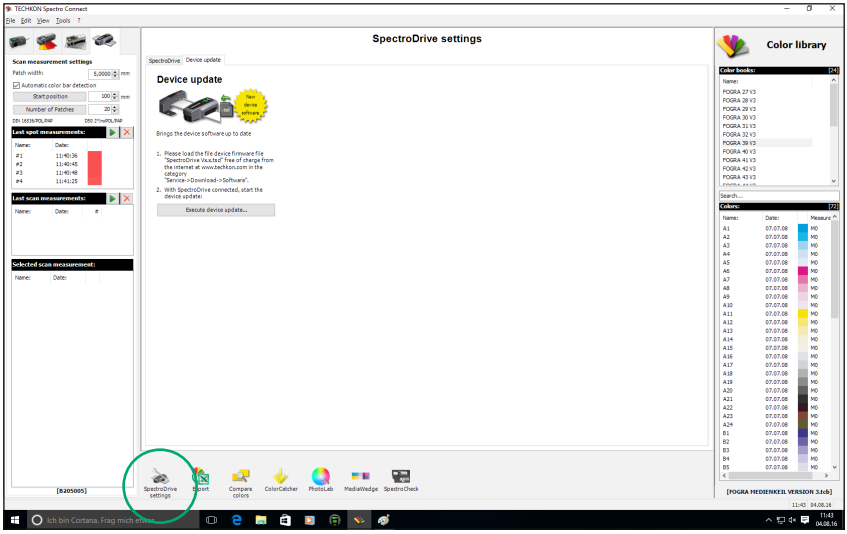
2. Device update: New device software can be uploaded into the device.



4.5 Device update

By the application of this module SpectroDrive can be loaded with a new internal firmware which is selected by **Device update**.

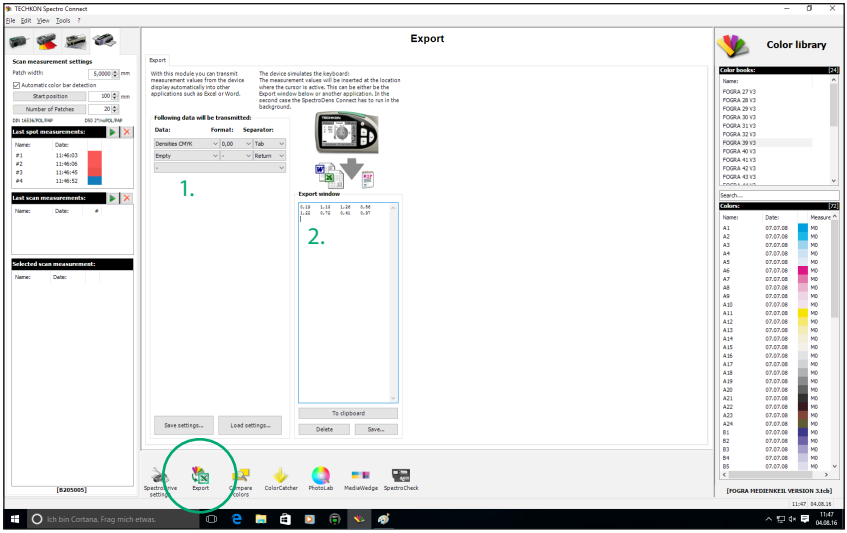
The procedure is explained in the program window:



4.6 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.

SpectroDrive works like the keyboard: Pressing the measurement button will insert the measurement value at the location where the cursor is active. This can be either the **Export** window (2.) or another application. In the second case SpectroDens Connect has to run in the .background.



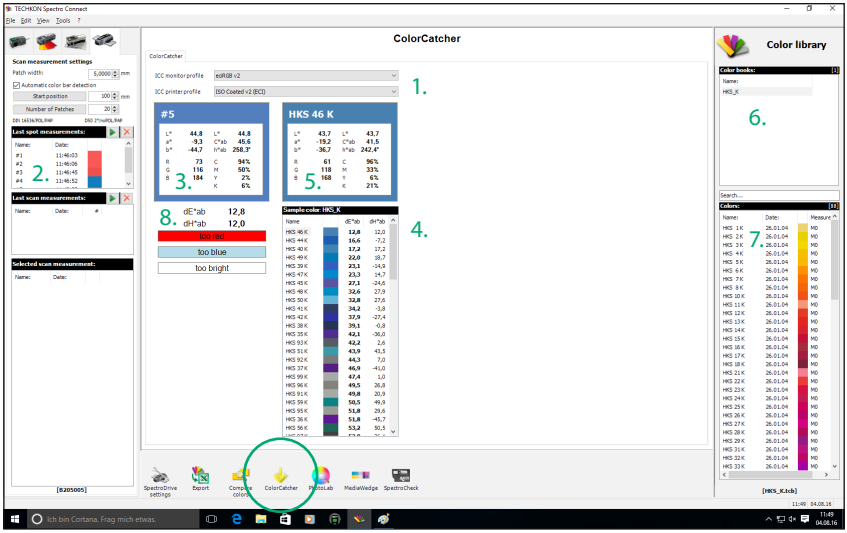
1. Here is defined, which data will be transmitted, how it will be formatted and what type of spacing between the measurement data will be. All the settings can be saved and recalled later.

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

This example shows the transfer of CMYK density values.

4.7 Software module: ColorCatcher

Based on a L*a*b*-measurement and referring to selected ICC profiles the program module **ColorCatcher** 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.

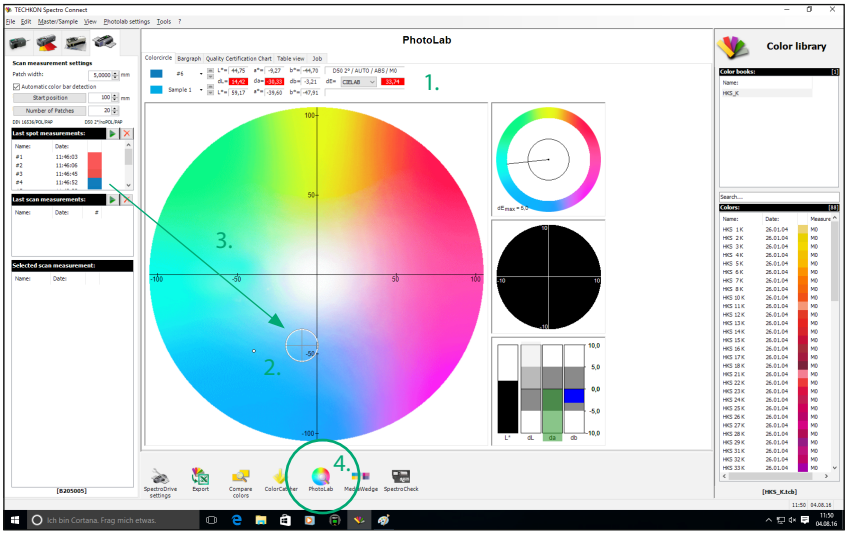
6. Self created color book

7. Colors from a color book

8. Variations and visible differences

4.8 Software module: PhotoLab

TECHKON PhotoLab is a program module for evaluating and displaying L*a*b* color data graphically. Selected measurements can be displayed and analyzed.



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

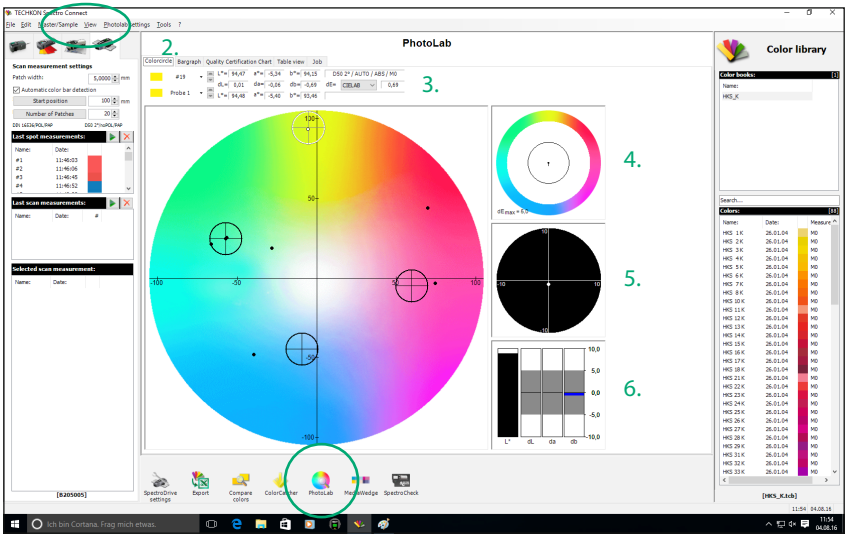
2. Reference:viewfinder with tolerance circle
   Sample: bold point
The current selected value is marked in white.

3. Color samples and references are directly imported into PhotoLab by making measurements with SpectroDrive 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.

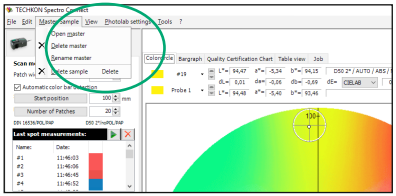
A pop-up window will ask, if the values should be used as sample or as reference values.

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



1. Masters 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.

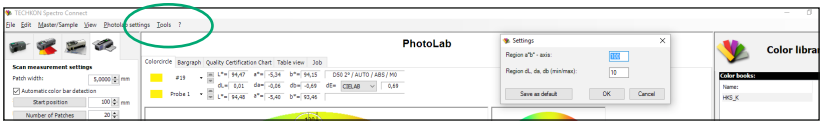
4. The black circle line indicates the tolerance limit of the ΔE*-region. If the black pointer reaches into the outer segment of the circle, the tolerance has been exceeded.

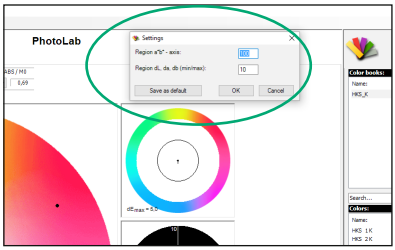
5. Enlarged view of the tolerance circle

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

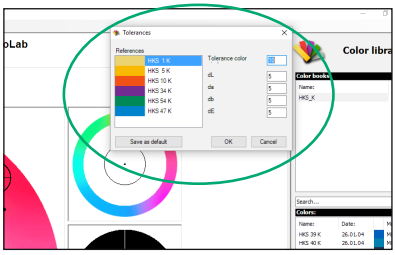
PhotoLab settings

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.

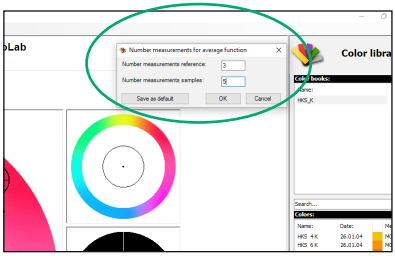




1. General settings:
This is the window for setting the dimensions of the L*a*b*-color circle and the ΔL*a*b*-color deviation.



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

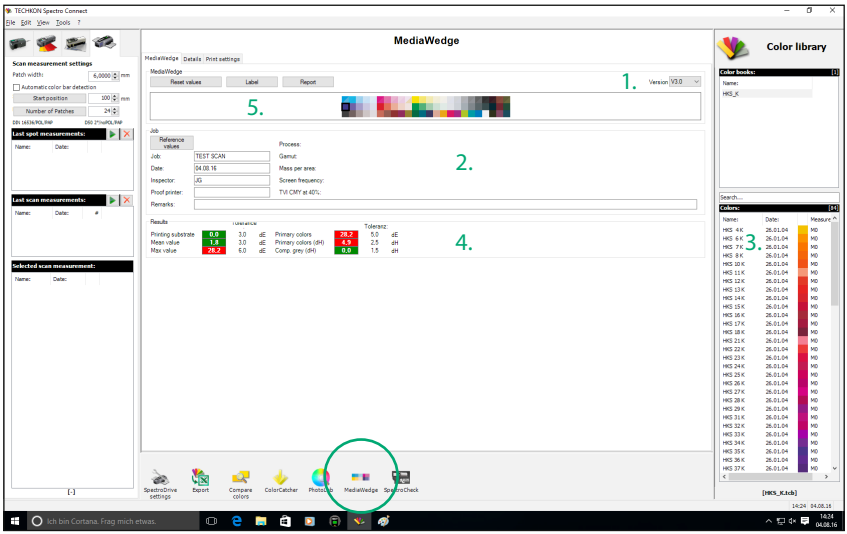


3. Mean values:
It can be appropriate to take several single measurements on one sample which then are averaged to an average value. The number of measurements which result in the calculation of the average value is defined in this window.

4.9 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 the program module **Media Wedge**.



1. 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.

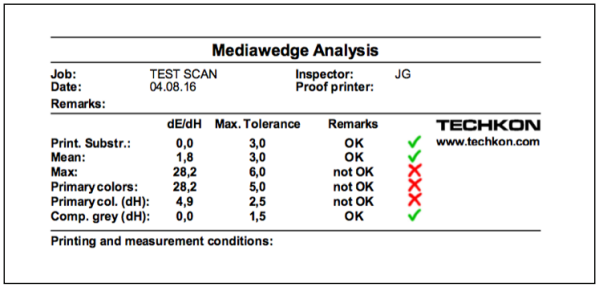
2. Overview of information concerning the print job

3. Selection of reference values

4. Overview of measurement results

5. Optionally a short protocol can be printed on a self-adhesive label with a Dymo label printer, which can be stuck on the proof, or a detailed report of the measurement values can be printed out.

Media wedge evaluation: Label and report



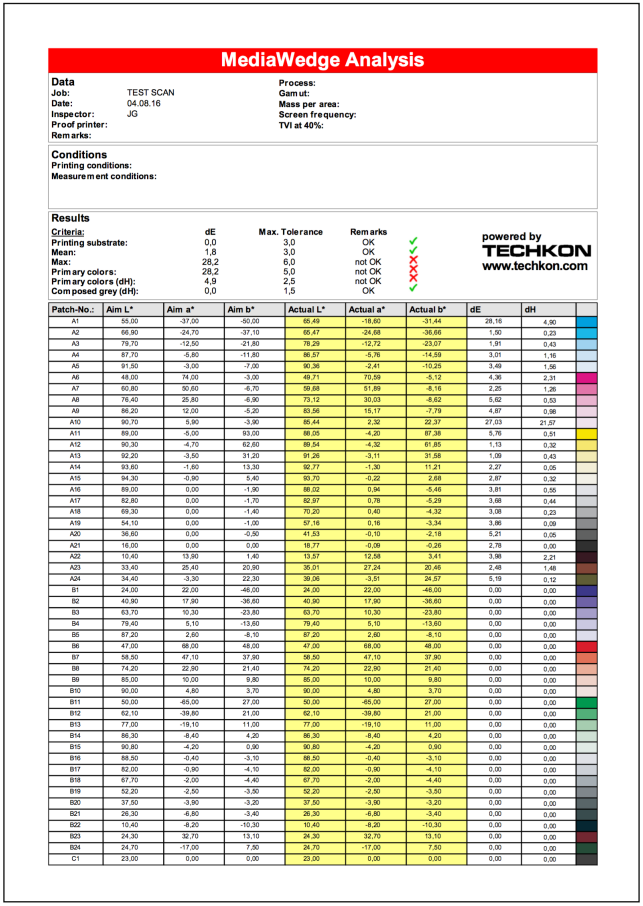
Mediawedge Analysis

Job: TEST SCAN **Inspector:** JG
Date: 04.08.16 **Proof printer:**
Remarks:

TECHKON
www.techkon.com

	dE/dH	Max. Tolerance	Remarks	
Print. Substr.:	**0,0**	**3,0**	**OK**	✓
Mean:	**1,8**	**3,0**	**OK**	✓
Max:	**28,2**	**6,0**	**not OK**	✗
Primary colors:	**28,2**	**5,0**	**not OK**	✗
Primary col. (dH):	**4,9**	**2,5**	**not OK**	✗
Comp. grey (dH):	**0,0**	**1,5**	**OK**	✓

Printing and measurement conditions:



MediaWedge Analysis

Data
Job: TEST SCAN
Date: 04.08.16
Inspector: JG
Proof printer:
Remarks:
Process:
Gamut:
Mass per area:
Screen frequency:
TVI at 40%:

Conditions
Printing conditions:
Measurement conditions:

Results

powered by TECHKON www.techkon.com

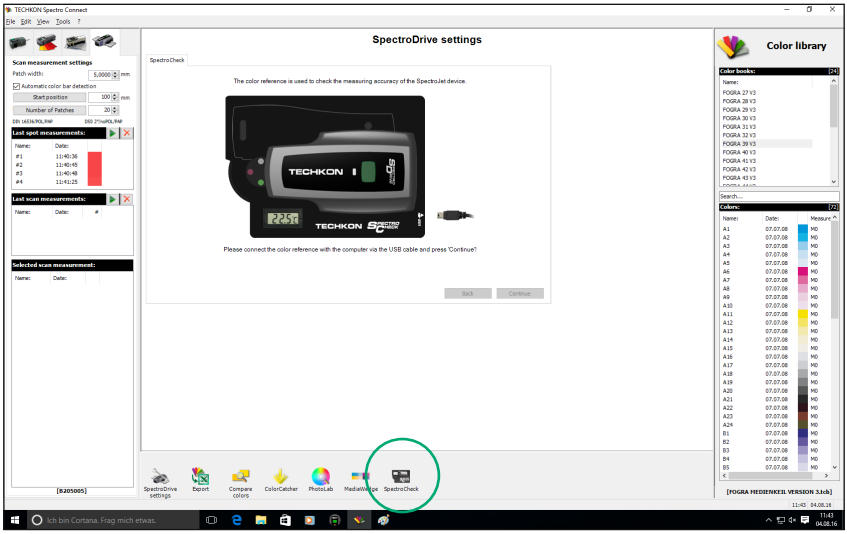
Criteria:	dE	Max. Tolerance	Remarks	
Printing substrate:	0,0	3,0	OK	✓
Mean:	1,8	3,0	OK	✓
Max:	28,2	6,0	not OK	✗
Primary colors:	28,2	5,0	not OK	✗
Primary colors (dH):	4,9	2,5	not OK	✗
Composed grey (dH):	0,0	1,5	OK	✓

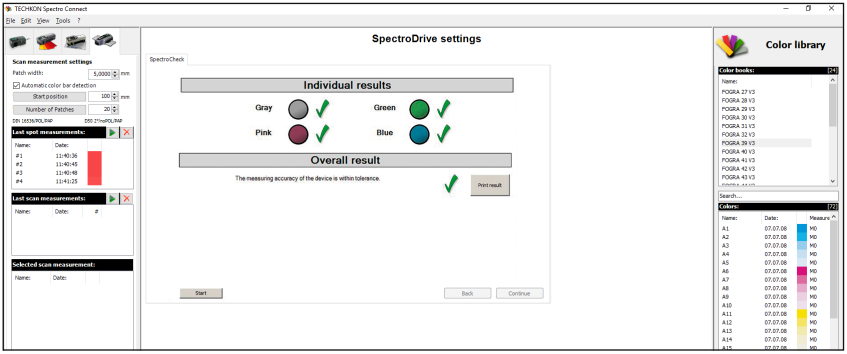
Patch-No.:	Aim L*	Aim a*	Aim b*	Actual L*	Actual a*	Actual b*	dE	dH	
A1	55,00	-37,00	-50,00	66,49	-18,60	-31,44	28,16	4,90	
A2	66,90	-24,70	-37,10	65,47	-24,68	-36,66	1,50	0,23	
A3	79,70	-12,50	-21,80	78,29	-12,72	-23,07	1,91	0,43	
A4	87,70	-5,80	-11,80	86,57	-5,76	-14,59	3,01	1,16	
A5	91,50	-3,00	-7,00	90,36	-2,41	-10,25	3,49	1,56	
A6	48,00	74,00	-3,00	49,71	70,59	-5,12	4,36	2,31	
A7	60,80	50,60	-6,70	59,68	51,89	-8,16	2,25	1,26	
A8	76,40	25,80	-6,90	73,12	30,03	-8,62	5,62	0,53	
A9	86,20	12,00	-5,20	83,56	15,17	-7,79	4,67	0,98	
A10	90,70	5,90	-3,90	88,44	2,32	22,37	27,03	21,57	
A11	89,00	-5,00	93,00	88,05	-4,20	87,38	5,76	0,51	
A12	90,30	-4,70	62,60	89,54	-4,32	61,85	1,13	0,32	
A13	92,20	-3,50	31,20	91,26	-3,11	31,58	1,09	0,43	
A14	93,60	-1,60	13,30	92,77	-1,30	11,21	2,27	0,05	
A15	94,30	-0,90	5,40	93,70	-0,22	2,68	2,87	0,32	
A16	89,00	0,00	-1,90	88,02	0,94	-5,46	3,81	0,55	
A17	82,80	0,00	-1,70	82,97	0,78	-5,29	3,68	0,44	
A18	69,30	0,00	-1,40	70,20	0,40	-4,32	3,08	0,23	
A19	54,10	0,00	-1,00	57,16	0,16	-3,34	3,86	0,09	
A20	36,60	0,00	-0,50	41,53	-0,10	-2,18	5,21	0,05	
A21	16,00	0,00	0,00	19,77	-0,09	-0,26	2,78	0,00	
A22	10,40	13,90	1,40	13,57	12,58	3,41	3,98	2,21	
A23	33,40	25,40	20,90	35,01	27,24	20,46	2,48	1,48	
A24	34,40	-3,30	22,30	39,06	-3,51	24,57	5,19	0,12	
B1	24,00	22,00	-46,00	24,00	22,00	-46,00	0,00	0,00	
B2	40,90	17,90	-36,60	40,90	17,90	-36,60	0,00	0,00	
B3	63,70	10,30	-23,80	63,70	10,30	-23,80	0,00	0,00	
B4	79,40	5,10	-13,60	79,40	5,10	-13,60	0,00	0,00	
B5	87,20	2,60	-8,10	87,20	2,60	-8,10	0,00	0,00	
B6	47,00	68,00	48,00	47,00	68,00	48,00	0,00	0,00	
B7	58,50	47,10	37,90	58,50	47,10	37,90	0,00	0,00	
B8	74,20	22,90	21,40	74,20	22,90	21,40	0,00	0,00	
B9	85,00	10,00	9,80	85,00	10,00	9,80	0,00	0,00	
B10	90,00	4,80	3,70	90,00	4,80	3,70	0,00	0,00	
B11	50,00	-65,00	27,00	50,00	-65,00	27,00	0,00	0,00	
B12	62,10	-39,80	21,00	62,10	-39,80	21,00	0,00	0,00	
B13	77,00	-19,10	11,00	77,00	-19,10	11,00	0,00	0,00	
B14	86,30	-8,40	4,20	86,30	-8,40	4,20	0,00	0,00	
B15	90,80	-4,20	0,90	90,80	-4,20	0,90	0,00	0,00	
B16	88,50	-0,40	-3,10	88,50	-0,40	-3,10	0,00	0,00	
B17	82,00	-0,90	-4,10	82,00	-0,90	-4,10	0,00	0,00	
B18	67,70	-2,00	-4,40	67,70	-2,00	-4,40	0,00	0,00	
B19	52,20	-2,50	-3,50	52,20	-2,50	-3,50	0,00	0,00	
B20	37,50	-3,90	-3,20	37,50	-3,90	-3,20	0,00	0,00	
B21	26,30	-6,80	-3,40	26,30	-6,80	-3,40	0,00	0,00	
B22	10,40	-8,20	-10,30	10,40	-8,20	-10,30	0,00	0,00	
B23	24,30	32,70	13,10	24,30	32,70	13,10	0,00	0,00	
B24	24,70	-17,00	7,50	24,70	-17,00	7,50	0,00	0,00	
C1	23,00	0,00	0,00	23,00	0,00	0,00	0,00	0,00	

4.10 Software module: SpectroCheck

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

Connect SpectroDrive 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
Measurement aperture	1.5 mm, appropriate for measuring patches with at least 3 x 3 mm (h x w)
Light source	LED, provides measurement conditions M0, M1, M2, M3 according to ISO 13655
Polarization filter	Twice linear crossed, switched on and off per software command
Measurement time	Approx. 160 mm/s for 4 mm patches (equals approx. 3 seconds for 520 mm sheet length), single measurement approx. 1 second (if SpectroDrive is used as hand-held device)
White reference	Absolute and relative; absolute white standard integrated in charging console
Illumination types	A, C, D50, D65, F 2/7/11
Standard observer	2°, 10°
Density filter	ISO/ANSI T, ISO/ANSI I, ISO E; spectral density Dmax
Density measurement range	0.00 – 2.50 D
Formats	52 (20") for sheet format 00 (B3+, 370 x 520 mm); 74 (28") for sheet format 0B (B2+, 520 x 740 mm); 102 (40") for sheet format 3B (B1+, 720 x 1020 mm); 105 (42") for sheet format 3B+ (B1+, 780 x 1050 mm); special formats (up to 2060 mm) on request
Repeatability	0.01 D; 0.03 CIE ΔE*a*b*
Inter-instrument agreement	0.01 D; 0.3 CIE ΔE*a*b*
Display single measurement	Color-OLED, 128 x 128 pixel
Data transmission	WLAN-module for wireless data transmission with PC-sided USB connection
Power supply	LiFePO4 battery, regulated recharge via charging console with AC adapter, 100 – 240 V, 47 – 63 Hz
Weight	Measurement device: 925 grams
Dimensions	59 x 96 x 170 mm (approx. 2.3 x 3.8 x 6.7 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 comparable processor, 4 GB RAM, 2 USB ports; Screen resolution for TECHKON ExPresso: minimum 1280 x 1024 pixel

Specifications can be subject to change without notice. All mentioned trademarks and copyrights are recognized. SpectroDens, SpectroPlate, SpectroJet, SpectroDrive, DENS, SpectroCheck, InkCheck and TECHKON are registered trademarks of TECHKON GmbH.

Manufacturer certificate

applicable for ISO 9000 documentation

Device: Scan-Spectrometer TECHKON SpectroDrive

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 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).

- EN 300 328
- EN 301 489-1/-17
- EN 62311

This device complies with

- FCC Part 15.247 and FCC Part 15 B
- FCC: XF6-RS9110N1102
- RSS-210 and ICES-003
- IC: 8407A-91101102
- Japan Test for wireless LAN, (2004-03) Art. 2 Paragraph 19
- Japanese Type Approval: R 202-LSE116 T D 16-0032 202

Notice: Changes or modifications made to this equipment not expressly approved by TECHKON GmbH may void the FCC authorization to operate this equipment.

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 SpectroDrive 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 of the white standard are derived from a ceramic white standard, which is referenced to measurements taken and certified by the National Institute of Standards and Technology (NIST).

Standards: The calculation of colorimetric values is accord. 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 das Produkt:
Declares that the product / déclare, que l e produit / si dichiara che il prodotto

Typ: Type / tipo	**SpectroDrive** (WLAN Version)
Verwendungszweck: Intended use / utilisation prévue / uso previsto	Farbmessungen Color measurements / mesure de la couleur / misurazione del colore

bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen gemäß Artikel 3 der R&TTE-Richtlinie 1999/5/EG entspricht und dass die folgenden Normen angewandt wurden:
complies with the essential requirements of Article 3 of the R&TTE 1999/5/EC Directive, if used for its intended use and that the following standards has been applied / répond aux exigences essentielles du Article 3 de la directive R&TTE 1999/5/EC, prévu qu'il soit utilisé selon sa destination, et qu'il répond aux standards suivants / soddisfa tutti i requisiti secondo l'art. 3 della direttiva R&TTE 1999/5/EC qualora venga utilizzato per l'uso previsto e che le seguenti norme siano applicate

1. Gesundheit (Artikel 3.1.a der R&TTE-Richtlinie)
Health / santé / salute

angewendete Norm: applied standard / standard appliqué / norma applicata / édition pubblicato	EN 62311 1999/519/EC Ausgabe 2008

2. Sicherheit (Artikel 3.1.a der R&TTE-Richtlinie)
Safety / sécurité électrique / sicurezza elettrica

angewendete Normen: applied standards / standards appliqués / norme applicate / édition pubblicato	IEC 60950-1:2005 (2. Edition)/ A1:2009 EN 60950-1:2006/A11:2009/ A1:2010/A12:2011

3. Elektromagnetische Verträglichkeit (Artikel 3.1.b der R&TTE-Richtlinie)
Electromagnetic compatibility / compatibilité electromagnétique / compatibilità elettromagnetica

angewendete Normen: applied standards / standards appliqués / norme applicate / édition pubblicato	ETSI EN 301 489-1 V1.8.1 Ausgabe: 2008-04 ETSI EN 301 489-17 V2.1.1 Ausgabe: 2009-05

4. Effiziente Nutzung des Funkfrequenzspektrums (Artikel 3.2 der R&TTE-Richtlinie)
Efficient use of the radio frequency spectrum / efficacité du spectre radio / effettivo uso dello spettro radio

angewendete Norm: applied standard / standard appliqué / norma applicata / édition pubblicato	ETSI EN 300 328 V1.7.1 Ausgabe: 2006-10

Please copy this registration card and send it by mail or via telefax to us. This way we can keep you informed in future about product news.
You can send your registration information by E-mail as well.
TECHKON GmbH ▪ Wiesbadener Str. 27 ▪ D-61462 Königstein/Germany ▪ Telefax: +49 (0)6174 9244 99 ▪ E-mail: info@techkon.com

TECHKON Registration card

☐ Please send me information about the entire TECHKON product range

☐ 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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