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# TECHKON



## **S****P****E****C****T****R****O** **D****R****I****V****E**

**Manual**

Scan-Measurement-System

**SpectroDrive**

Software

**ExPresso 3**

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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 3 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 3

Chapter 3: How to use SpectroDrive and the software ExPresso 3

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 only a few minutes. The third chapter will show you detailed insight into the measurement functions.

Please get the device registered by using the detachable registration card, which is the last page of this manual. That way we can keep you updated about product news.

Please visit us as well on the internet at <http://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

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EC-Declaration of Conformity  
Registration card

## Chapter I

### General description of the measurement system

#### I.1 Product description

TECHKON SpectroDrive, with its automatic color and density measurement capabilities, is the perfect solution to substantially increase press productivity by ensuring consistent print-to-print color accuracy throughout the press run.

The system consists of the following components: The motorized measurement system scans the complete color bar on a printed sheet within seconds and simultaneously sends the spectral measurement data wirelessly to the PC where all relevant information for controlling the printing press is displayed.

The measurement device has only one button to start the measurement process. The PC-software ExPresso 3 has a self-explanatory user interface which can be operated via touch-screen. Installation is simple as well. After a few minutes the system is operable and ready to take measurements.

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.

The TECHKON ExPresso 3 software offers a comprehensive tool-set comprising measurement of spot colors, support of up to 16 print units, face- 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 excerpt of the complete functionality.

Thanks to its modularity, ExPresso 3 is expandable and versatile. The measurement data can be exported into other software applications that connect real-time to printing presses to enable a 'close loop' turn-key solution. In addition, TECHKON ExPresso 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
- TECHKON ExPresso PC-software 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; no cable required
- 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 1800 mm
- space-saving measurement device fits on any table
- the mounting table can be inclined up to 45°
- delivery contains all components supplied in a practical carrying case

### 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 and DIN standards
- UV cut filter option available
- robust design 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!)
- on-line time wireless data transmission to the PC during scan
- information overview displays 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.

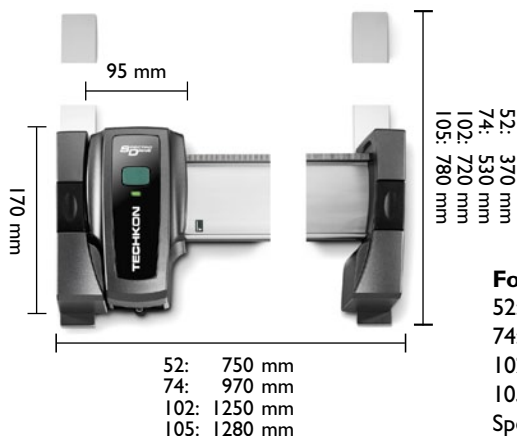


**SpectroDrive** is the ideal extension to TECHKON's renown hand-held measurement instruments:

**SpectroPlate** is the perfect tool for accurately reading printing plates and **SpectroDens** is the mobile, multi-purpose spectrodensitometer which can be used at any location.



## Dimensions



### 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/1800 mm scan length) on request

## Two different 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 area, dot gain and printing contrast
- slur/doubling value
- target values, references, tolerances, OK-sheet
- face- 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 and 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  $\Delta E^*a^*b^*$ -display, CIE  $L^*a^*b^*$ ,  $\Delta L^*a^*b^*$ ,  $L^*C^*h^*$ ,  $\Delta L^*C^*h^*$
- "InkCheck" recommendation for ink key setting
- display and evaluation according to ISO 12647, Gracol G7™
- supports up to 16 printing units

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

## I.2 Packing list



The carrying case protects SpectroDrive and parts

### Contents of delivery:

- measurement device SpectroDrive
- left holder incorporating charging console and white standard, horizontal track, right holder
- two vertical bars
- AC adapter with universal plugs
- module for wireless data transmission, USB cable.
- carrying case, manual with ISO 9000 certificate, screwdriver, 4 screws.
- optional: CD with software ExPresso 3, USB-dongle (software protection key)

System requirements: for TECHKON software: Microsoft Windows XP, Vista or 7.

Recommended touch-screen:  
Elotouch I727L I7"

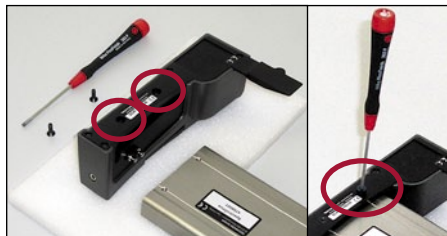
### Optional accessories:

- print control strips TECHKON TCS, available as EPS- and pdf-files on CD (can be downloaded free of charge at <http://www.techkon.com>)
- software-upgrades from ExPresso Basic to ExPresso Pro
- replacement parts: left holder with charging console and white standard, rechargeable battery, measurement lamp.  
All parts are easy to exchange.
- color reference **SpectroCheck** for checking the measuring accuracy

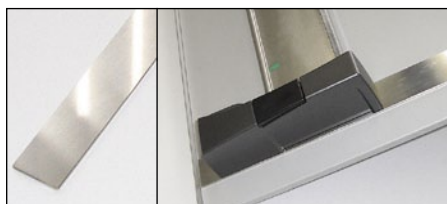
## Chapter 2

### Installation of SpectroDrive and the software ExPresso 3

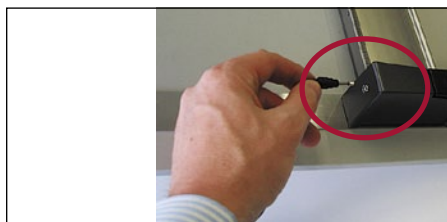
#### 2.1 Assembly of SpectroDrive



- 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. The surface has to be flat and with uniform color. Preferably the table will have a lay-on edge for positioning the printed sheet. 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.



- Connect the plug of the AC adapter with the charging console. The AC adapter can be used universally for 100 – 240 V. Use only the original TECHKON SpectroDrive AC adapter! (Part no.: FRIWO FW 75550/08).

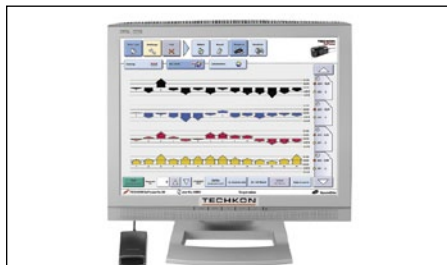


- There are three adapter plugs for different countries. For changing, just pull the plug and push in the new one. Make sure that the plug adapter has a tight fit.

## 2.2 Installation of the software ExPresso 3

### System requirements:

- PC with MS-Windows XP, Vista or 7.
- 2 USB ports
- Screen resolution: 1024 x 768 or higher



The software is optimized to be operated with a touch sensitive screen (for example: Elotouch 1727L 17"). 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 with ExPresso 3 software).

### Installation:

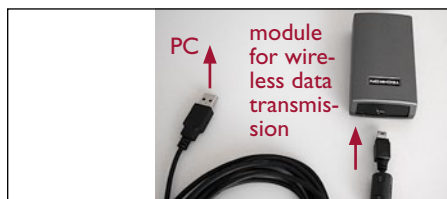
It is important to carry out the following steps in the right order, to make sure that the USB device drivers will be installed properly.

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.



Module for wireless data transmission

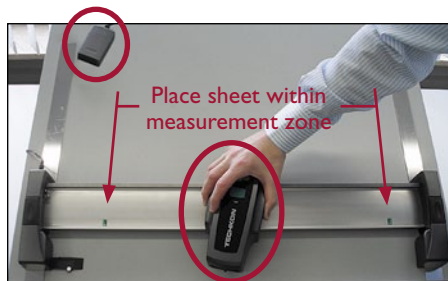


## Chapter 3

### How to use SpectroDrive and the software ExPresso 3

#### 3.1 Operation of SpectroDrive

##### Automatic measurement



- 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 (see p. 11).

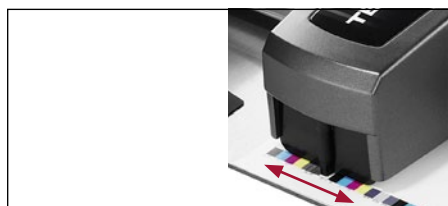


- By pressing the green measurement button the device will move into the charging station at the left, where it is automatically charged, which is indicated by a green-flashing LED.



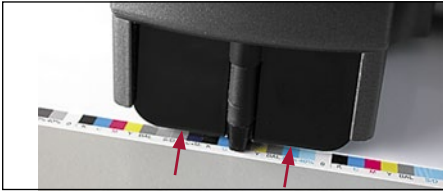
- You can align the measurement system in vertical direction. By keeping the black buttons on the left and right holder pressed you reduce the magnetic adhesion of the holders.

- 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. It can be helpful to slide the measurement device from one side to the other in order to check that the measurement aperture covers the complete color bar during a scan.

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. An acoustic signal confirms, that the measurement is completed and the measurement data are displayed by the ExPresso software in the window "Spot measurement".

## 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. 35).

## 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 two minutes. It can be reactivated by pressing the green button on the device.

## LED Indicator

The rectangular LED on top of the device will appear in different colors dependent on the device status:



Home position: Green (flashing)



Scan-Mode: Blue (+ multicolor)



Spot measurement: Magenta



Paper calibration: White



Error: Red (flashing)

In home position the device is in contact with the charging station. During charging the LED will be green and flashing. It will turn to a short-flashing green when the battery is fully charged. Thanks to the charging management there will be no overcharging of the battery.

### 3.2 Care and maintenance

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!

#### Cleaning

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.

The charging contacts at the device and on the charging console can be kept clean with a cotton bud soaked in metal contact spray.



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 (LED is flashing in green during charging and short-flashing green when fully charged).
- If the device does not communicate with the software and does not work by pressing a button, but the LED is on, move it manually from the charging position. Now, wait until it switches off automatically after two minutes. Then, turn it on again by pressing the green button.

## Warranty

The warranty for TECHKON products is 24 months starting with the date of purchase. 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.

## How to change the battery



1. Open the SpectroDrive device.  
A TORX™ T10 screwdriver was shipped with the SpectroDrive unit. Use it to unscrew the four screws as shown in the picture.

2. Disconnect the battery. To prevent damages to the battery make sure to pull only the plug, not the cable.

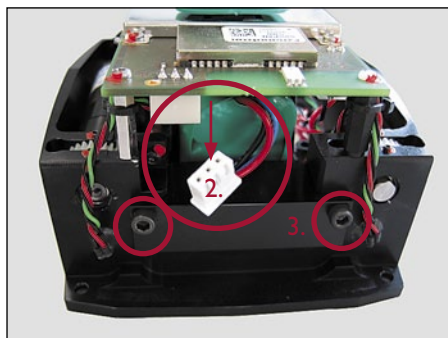
3. Remove the two screws and pull out the bridge.

4. Change the battery. Please ensure that the cable faces the mainboard.

5. Mount the bridge (see also 3.).

6. Mount the plastic housing using the four screws (see also picture 1).

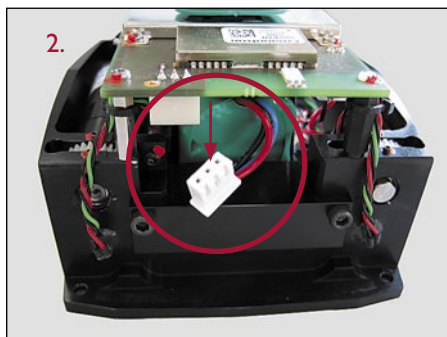
7. Make sure that the measurement head moves freely between its stoppers.



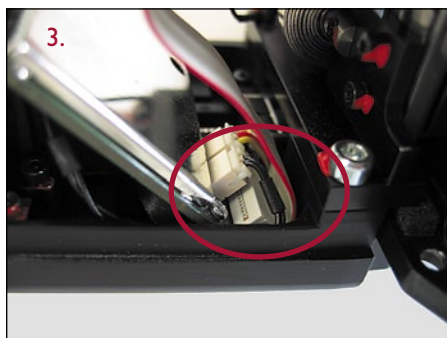
## How to change the lamp



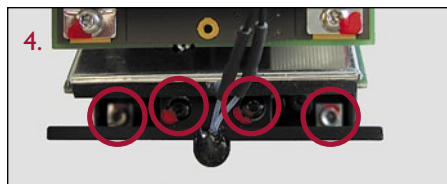
1. Open the SpectroDrive device.  
A TORX™ T10 screwdriver was shipped with the SpectroDrive unit. Use it to unscrew the four screws as shown in the picture.



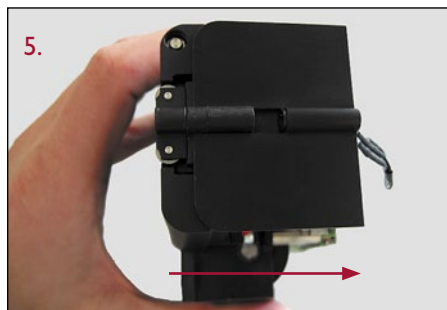
2. Disconnect the battery from the mainboard. To prevent damages to the battery make sure only to pull the plug, not the cable.



3. Disconnect the lamp as shown in the picture. Be sure to disconnect the black cable only.



4. Unscrew the lamp.  
A TORX™ T6 screwdriver is shipped with the new lamp. There are four screws, two on top and two at the round of it.



5. Change the lamp.  
Pull it firmly to the side and make sure not to tilt it, because it may jam.

6. Slide in the new lamp.  
Move it completely to the end of the groove.

7. Reassemble the four screws to hold the lamp in place as shown in picture 4).

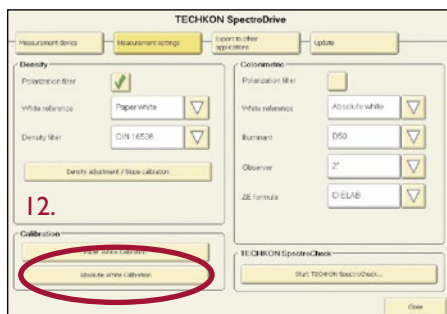
8. Reconnect the plug of the lamp as shown in picture 3. Make sure that the plug is not wedged; it can only be mounted in one way. **IMPORTANT:** It is necessary to clamp the black cable between the mainboard and the metal housing, as shown in picture 3. Otherwise it may rub against the plastic housing or disturb the movements of the measurement head.

9. Reconnect the battery. Make sure that the plug is not wedged; it can only be mounted in one way.

10. Mount the plastic housing using the four screws as shown in picture 1.

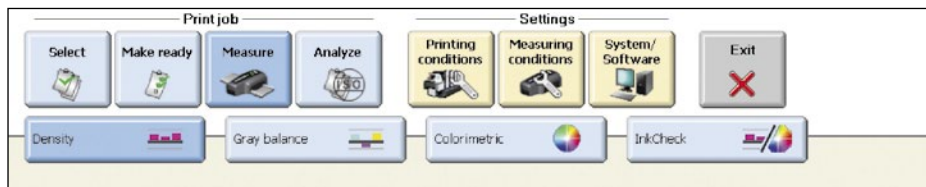
11. Make sure that the measurement head moves freely between its stoppers

12. Recalibrate the device on the white calibration standard. Open the window at “Settings → Measuring conditions → Measurement devices and press “Absolute White Calibration” (see p. 34).

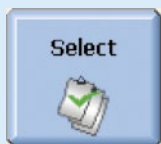


### 3.3 Software overview

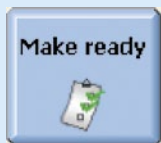
The software ExPresso is clearly structured. The menu bar comprises the three sections “Print job” (blue buttons), “Settings” (yellow buttons) and “Exit” (gray button). The appropriate submenu layers follow this color system persistently.



#### Print job:



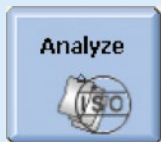
P. 41



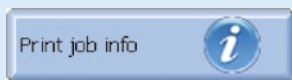
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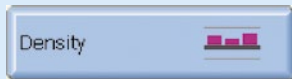
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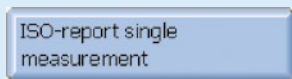
P. 44



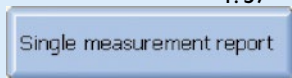
P. 48



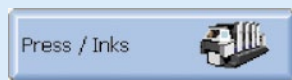
P. 53\*



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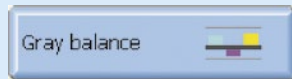
P. 60



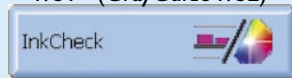
P. 43



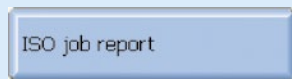
P. 46



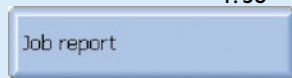
P. 51 (GrayGuide P. 52)



P. 54\*



P. 58\*



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\* ExPresso Pro only

## Settings:

Printing  
conditions



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Presses



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Color bar



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Inks



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Measuring  
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Target values /  
Tolerances



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Measurement  
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GrayGuide targets



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System/  
Software



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System/  
Software



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## Exit:

Exit



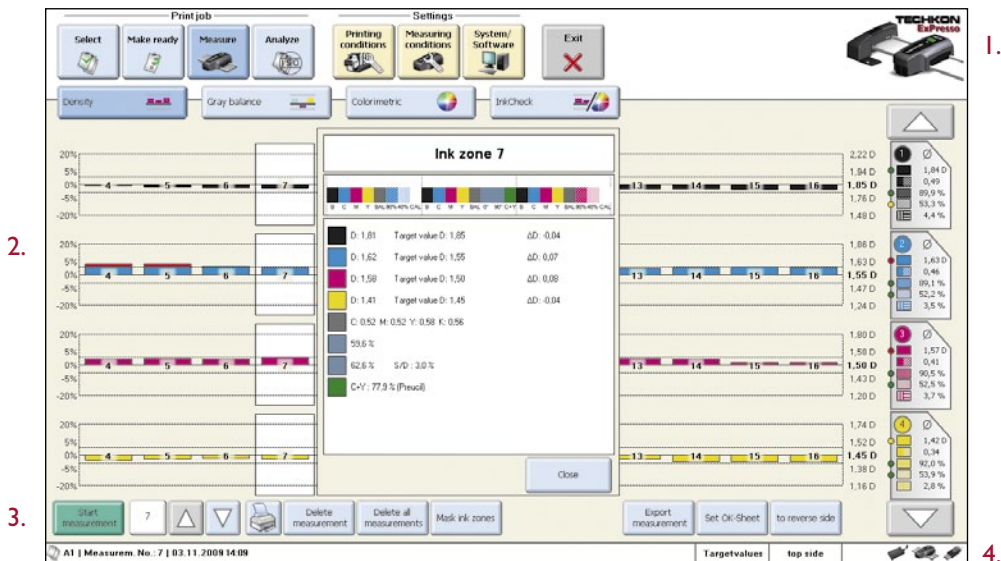
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By clicking on the device icon in the right section of the **menu bar** (1.), one gets a direct access to important device settings. A window is displayed with the submenus “Measurement device”, “Measurement settings”, “Export to other applications” 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 requests you to connect the measurement device to the PC or to select another measurement device out of the settings menu. In the menu item "Settings → Measuring conditions → Measurement devices" there is also the option "SpectroDrive Simulator" to your disposal. Please keep in mind, that the simulator provides only virtual measuring data for test- and demo-purposes.

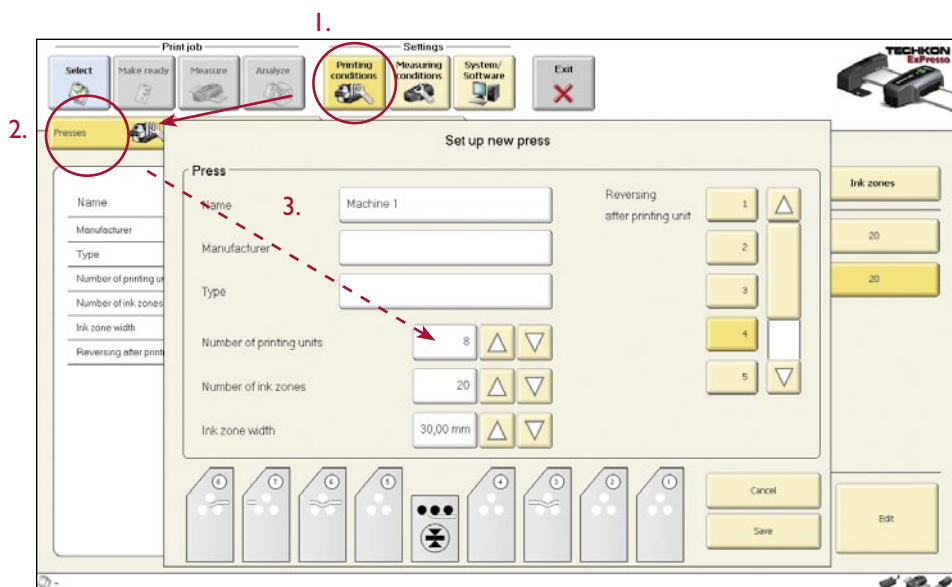




If you have not defined any printing machine in the menu section “Settings → Printing conditions → Presses” up to now, you will see the following info window:



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 it has been installed and 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 **yellow** “Settings” buttons (1., p. 24) and then selecting one button from the sublayer (2., p. 24). The referring window opens (3., p. 24) and can be edited.

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 and 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.

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. 24) 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.

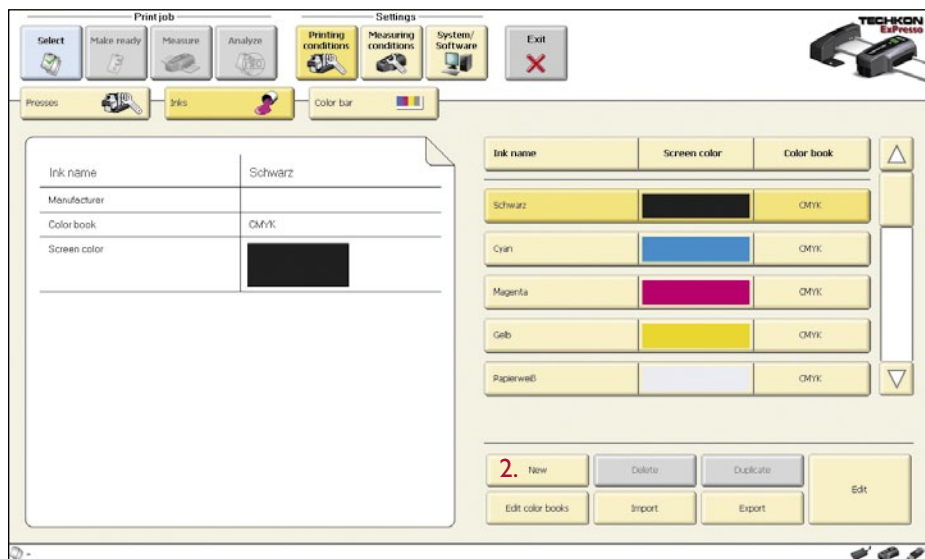
## Printing conditions – Inks



The list of inks included in the database is displayed. The four process colors C, M, Y and K (I.) are pre-installed. They are stored in the color book CMYK and are already marked by a screen color. The four process colors 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”.

The screenshot shows a 'Define new ink' dialog box with the following fields and buttons:

- 1.** Ink name: A text field containing 'HKS 7 K'.
- 2.** Manufacturer: An empty text field.
- 3.** Color book: A dropdown menu showing 'Spot colors' and a button labeled 'Edit color books'.
- 4.** Density channel: A dropdown menu showing 'Maximum density' and a small yellow button with a downward arrow.
- 5.** Screen color: A color selection box showing a light beige color.

At the bottom of the dialog are three buttons: a green 'Measure' button, a grey 'Save' button, and a yellow 'Cancel' button.

- 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.

1. **New Color bar**

Name:

Manufacturer:

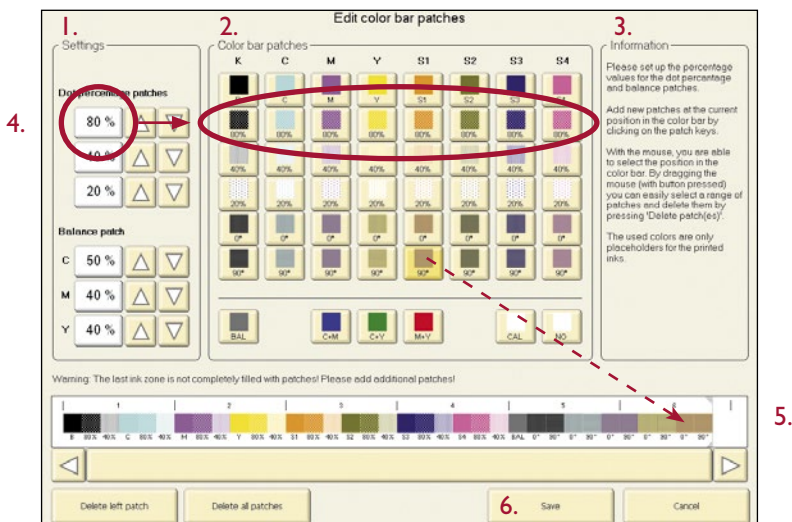
Number of inks:

Patch width:

Ink zone width:

- 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 sections “Settings” (1.), “Color bar patches” (2.) and “Information” (3.).

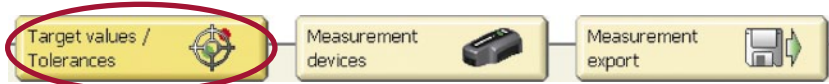


- First define three percentage values for the dot percentage patches and three for the balance patch (4.), which both are listed in “Color bar patches”.
- In the section “Color bar patches” now successively compile your individual color bar by clicking on the color bar patches. The color bar which you 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 “Measuring conditions” section:

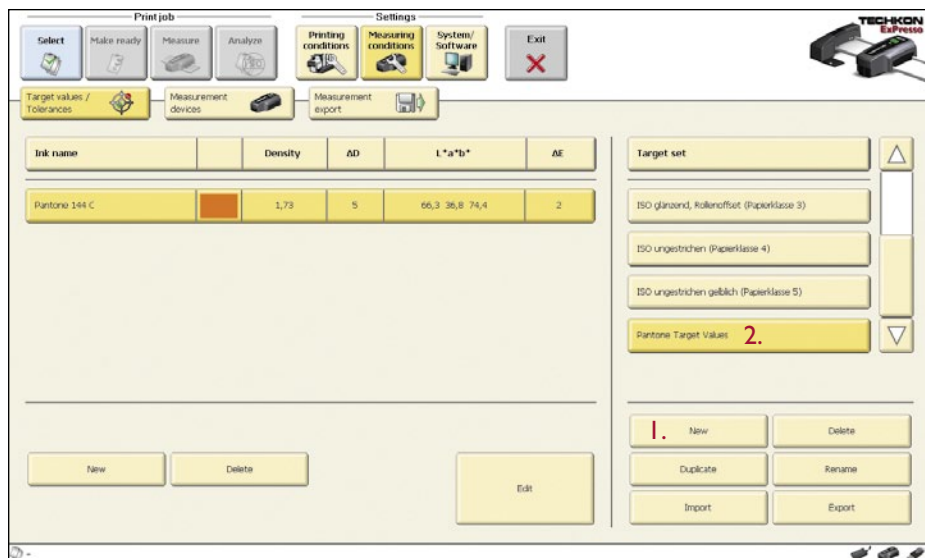


## Measuring conditions – Target values / Tolerances



A list of data sets for target values and tolerances will be displayed. It is based on ISO 12467 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.27).
- 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.).

**Target values / tolerances for ink Pantone 144 C**

Ink name 1. Pantone 144 C ▼

	Target values	Tolerances ±	Range
Density	<span style="border: 1px solid black; padding: 2px;">1,73 D</span> ▲ ▼	<span style="border: 1px solid black; padding: 2px;">5,0 %</span> ▲ ▼	<span style="border: 1px solid black; padding: 2px;">1,64 D</span> <span style="border: 1px solid black; padding: 2px;">1,82 D</span>
L*	<span style="border: 1px solid black; padding: 2px;">66,34</span> ▲ ▼		
a*	<span style="border: 1px solid black; padding: 2px;">36,82</span> ▲ ▼		
b*	<span style="border: 1px solid black; padding: 2px;">74,40</span> ▲ ▼		
ΔE		<span style="border: 1px solid black; padding: 2px;">2,0</span> ▲ ▼	
		<span style="border: 1px solid black; padding: 2px;">5,0 %</span> ▲ ▼	
		<span style="border: 1px solid black; padding: 2px;">5,0 %</span> ▲ ▼	



Measure
2.

OK
Cancel

- 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. 31). The target sets of the five paper classes can not be deleted.

## 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.

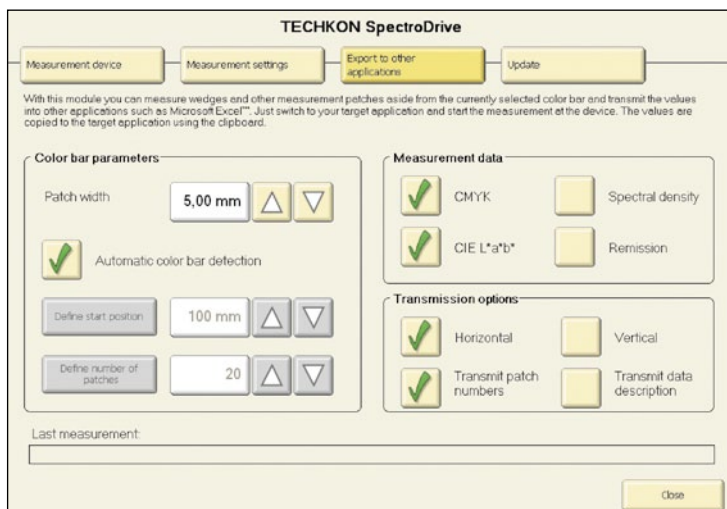
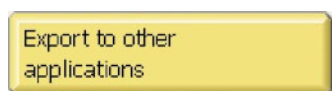
The pre-settings for colorimetric measurements are: polarization filter off, white reference is absolute white, illuminant is D50, observer is 2° and ΔE formula is CIELAB.

One can choose other standards by clicking on the pull-down-menu if required.

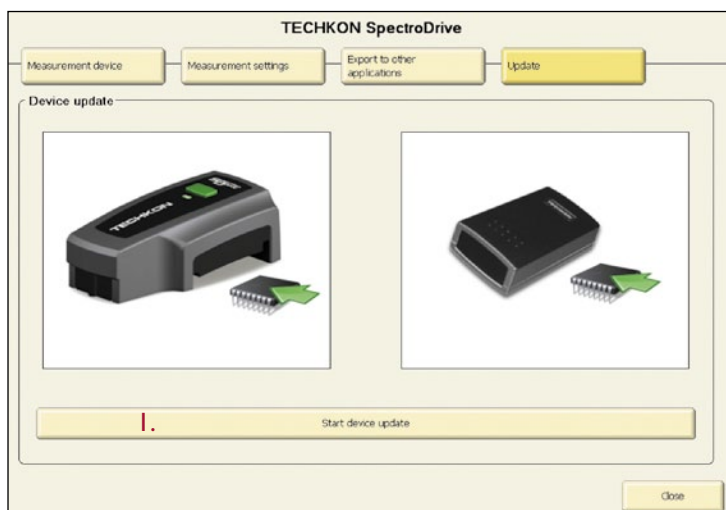
The buttons “Paper white calibration” and “Absolute white calibration” (4. on p. 34) start the corresponding calibration. The “Absolute white calibration” function is only available when the device stands on the track in the “home position”. After a calibration has been carried out properly, it will 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](http://www.techkon.com) → Service → Software → Folder: SpectroDrive / TECHKON Ex-Presso → TECHKON SpectroDrive Firmware 3.x. 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.

### Tip:

The device icon in the upper right corner of the screen shows you at a glance which type of measurement device (SpectroDrive or SpectroJet) is currently connected.

## Measuring conditions – Measurement export

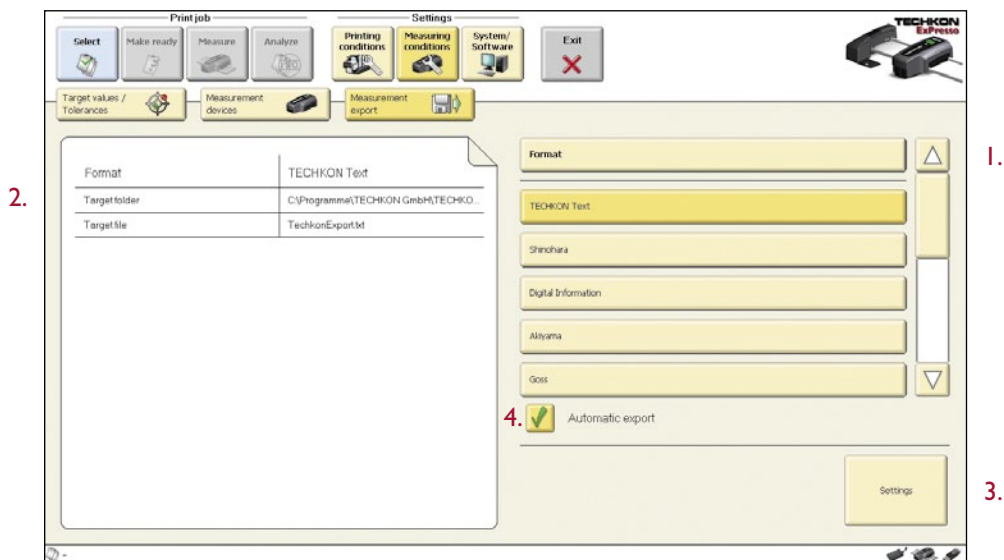


After each measurement, the values can be exported to other applications. The most popular export formats e.g. CSV (Microsoft Excel™) are already pre-installed (1.).

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.

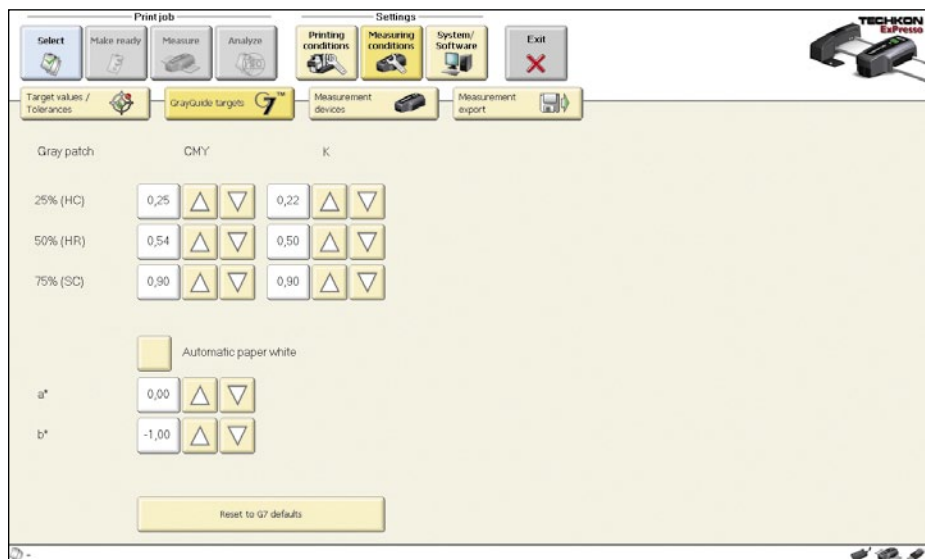


## Measuring conditions – GrayGuide targets



If in “Settings → System / Software” the option Gracol G7™ was selected to be the preferred Gray mode display (see picture p. 52), “Settings → Measuring conditions → GrayGuide targets” opens now a menu window, which allows to adjust the target values manually.

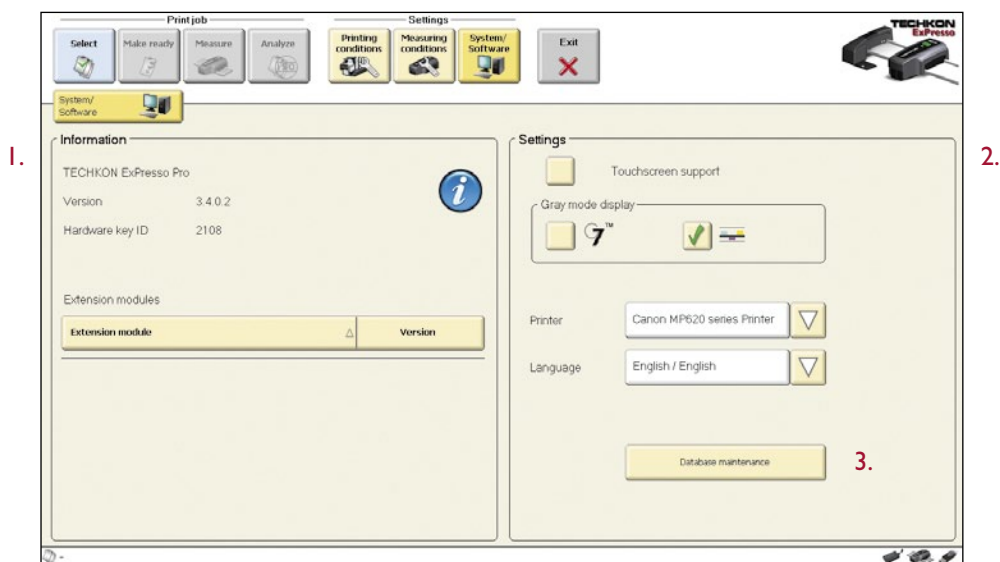
Gray patches as well as the automatic paper white can be edited. If required all values can be reset to the G7™ defaults.



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 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.

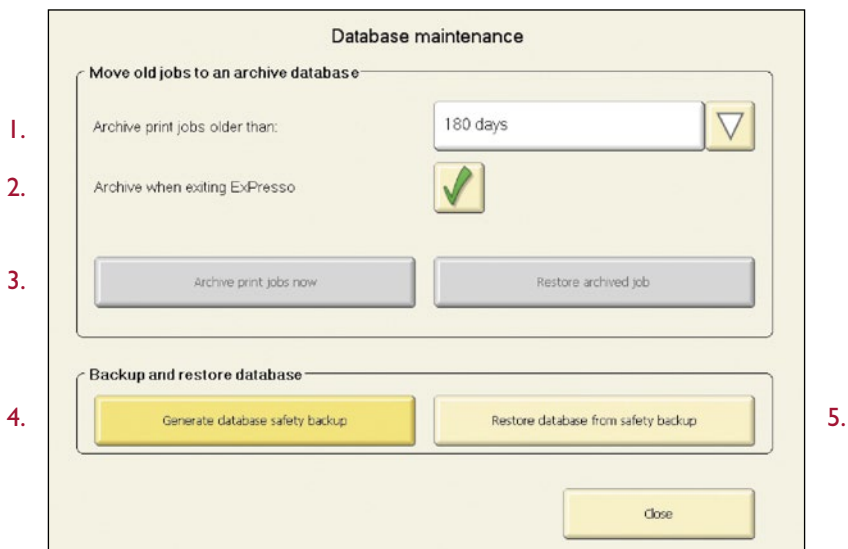
The button “Database maintenance” (3. in picture p. 39) opens a new window, where one can decide, after which period of time the print jobs will be archived (1.).

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 and the selected color bars (for the top side as well as for the reverse side).

2.

1.

3.

Print job	Customer name	Last measurement
A1		04.11.2009 13:28:42
A2		05.11.2009 09:49:10

Print job name	A1
Customer name	
First measurement	03.11.2009, 13:22
Last measurement	04.11.2009, 13:28
Press	
Measurements top side	9
Color bar top side	TECHKON TCS 300 C4
Measurements reverse side	7
Color bar reverse side	TECHKON TCS 300 C4

Search for

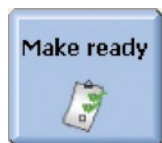
The “Search for” function supports the fast research for already existing “Print jobs”.

Clicking in the “Edit” button (3. in picture p. 41) provides a direct access to the sub-menu “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”.

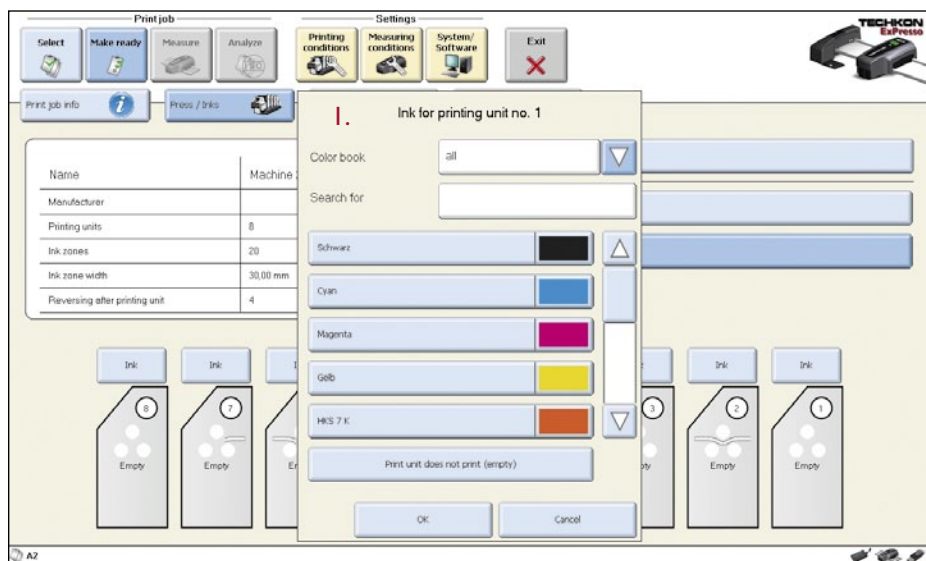
The text entered in “Print job name” will be the title of the data set, which will be automatically saved by ExPresso. It can be selected from the “Print job → Select” menu. During measurements it will be shown in the lower left section of the status bar.

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

## Make ready – Press / Inks

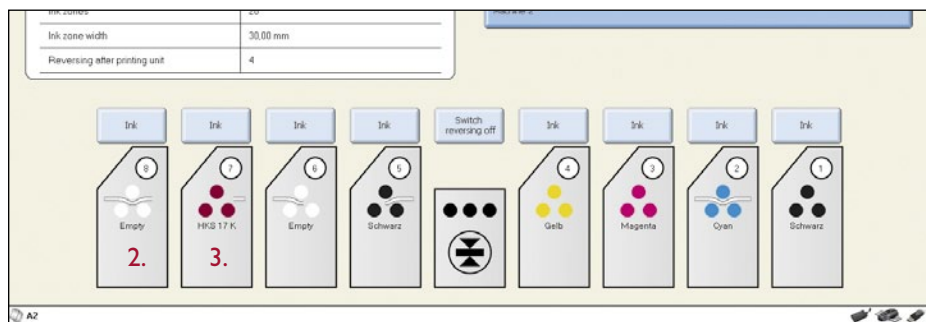


Select a press, which you have already defined in “Settings → Measuring conditions → Presses” (see p. 24 and 26) and fill the printing units virtually with ink (1.).



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.



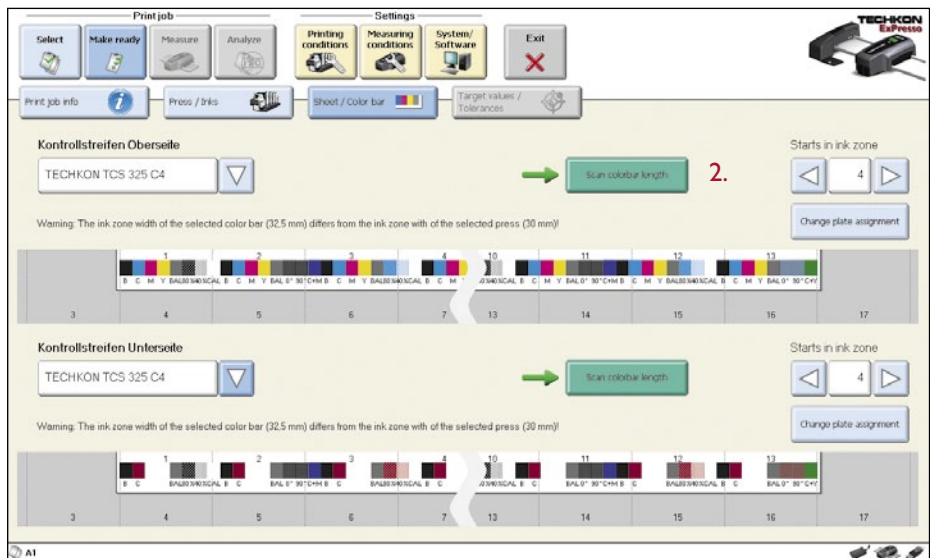
The picture on page 43 shows an 8-color press, with two empty printing units. Printing unit no. 7 contains the spot color HKS 17 K (3.), what can be seen at a glance by the screen color and the color name on the printing unit.

**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.



I. 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. 29 f.).

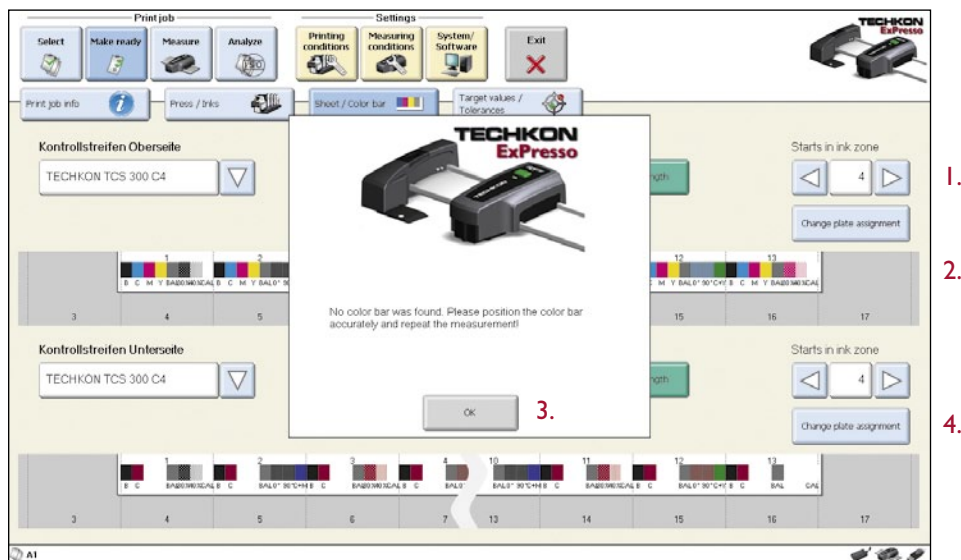
If a color bar is selected, whose ink zone width differs from the ink zone width of the selected press, a warning is displayed.

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 and 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.

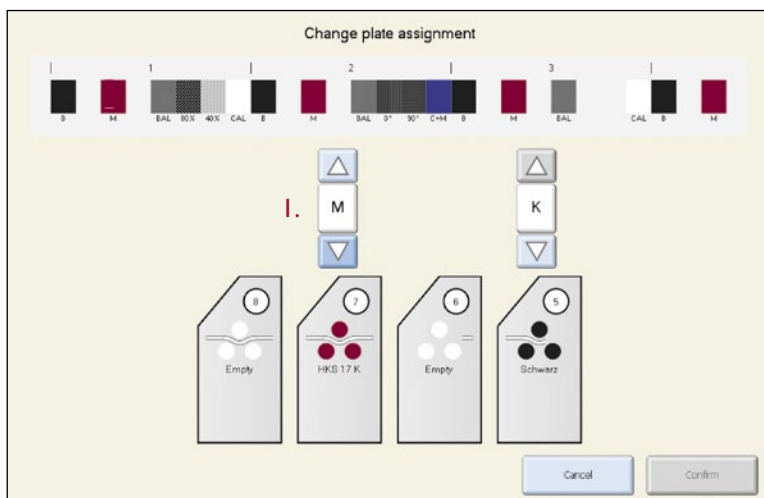


If a printing press with a reversing unit has been defined, there will be a measurement section for the top side as well as one for the reverse side. This provides the possibility to capture two different color bars for top- and reverse-printing.

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.

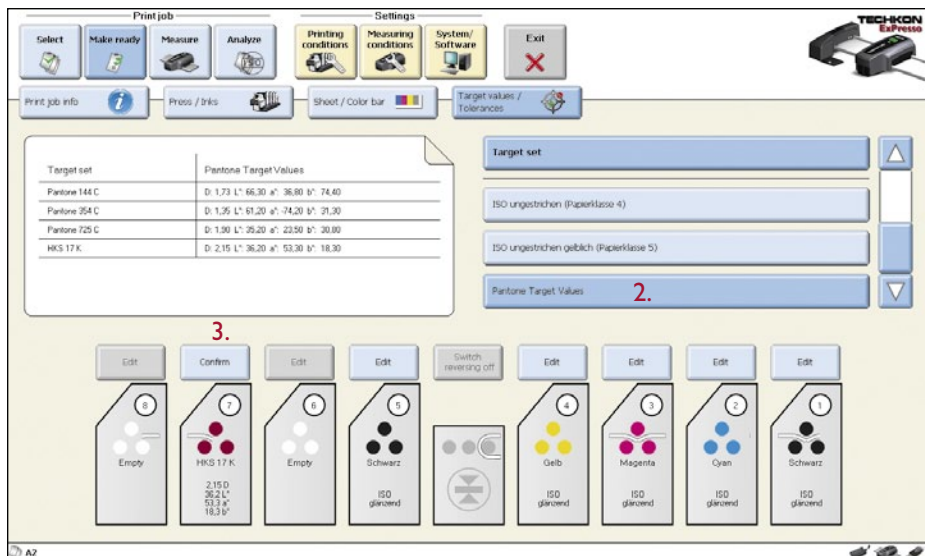
In the following example it has been necessary to assign the ink Magenta (I.) to the spot color HKS 17 K in printing unit no. 7. Thus the color bar will feature a measurement patch at the right position, which guarantees a proper measurement and analyze of the color bar.



## 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 for the paper classes 1 – 5, which are already pre-installed.



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. 31 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:

Target values / tolerances for print unit no. 7, ink HKS 17 K

	Target values	Tolerances ±	Range
Density	0.05	5,0 %	2,04 D 2,26 D
L*	36,21		
a*	53,25		
b*	18,27		
ΔE		2,0	
40%	15,0 %	5,0 %	50,0 % 60,0 %
90%	10,0 %	5,0 %	85,0 % 95,0 %

Buttons: Measure, OK, Cancel



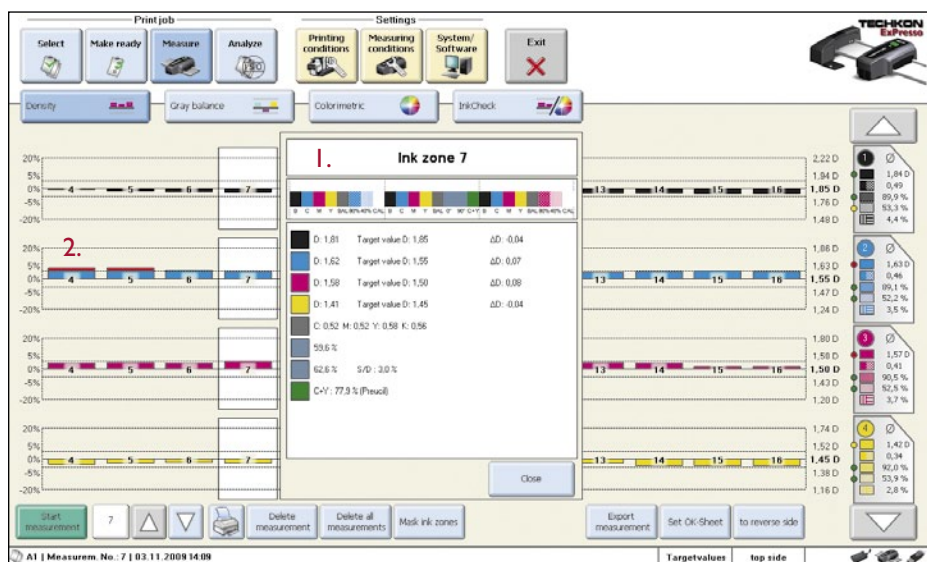
## Measurement of a print job



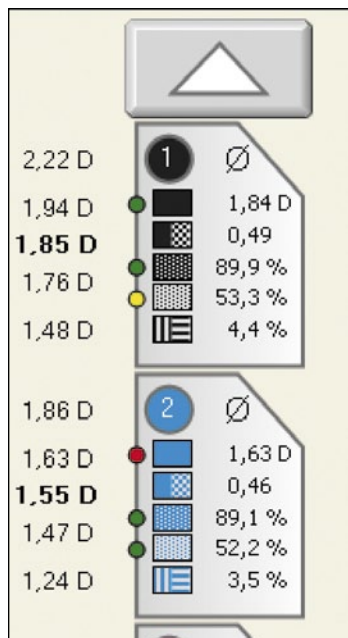
## Measure – Density



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.

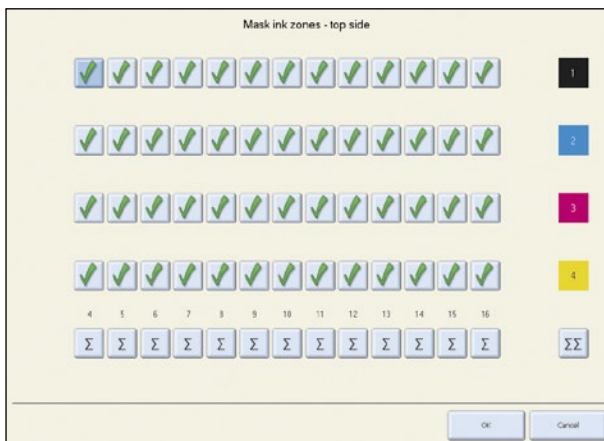
1. The green button starts a measurement.

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)



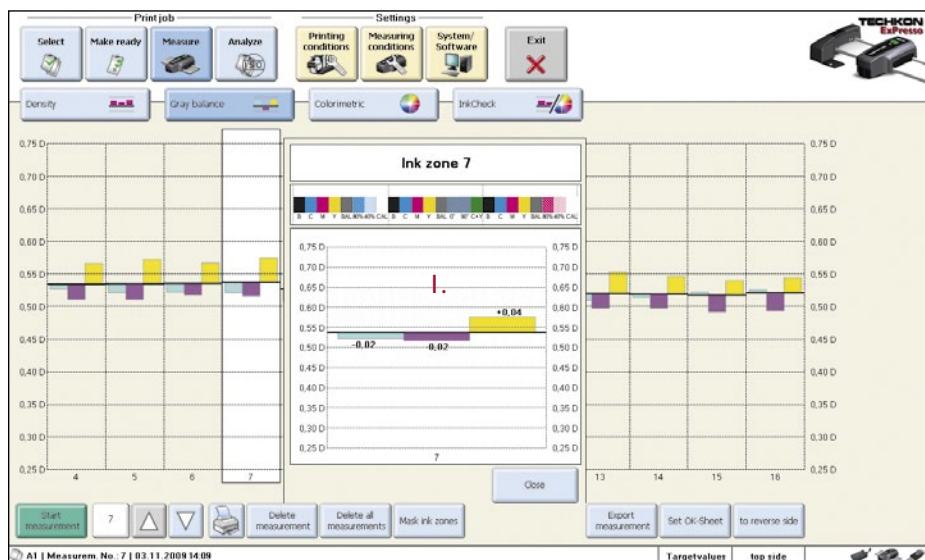
When making a measurement on a gray balance patch, the referring density values for the process colors (without K) are shown in a bar graph. The values for Cyan, Magenta and Yellow should be in close range to each other to ensure a neutral gray balance without a color hue.

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 (I.).

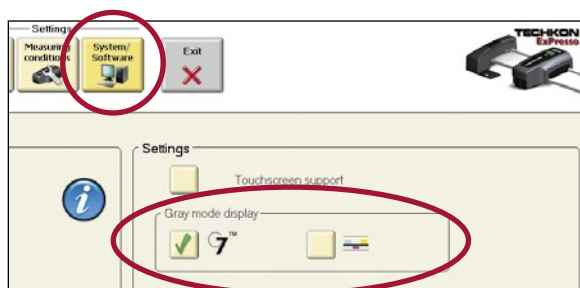


## Measure – GrayGuide (according to Gracol G7™)

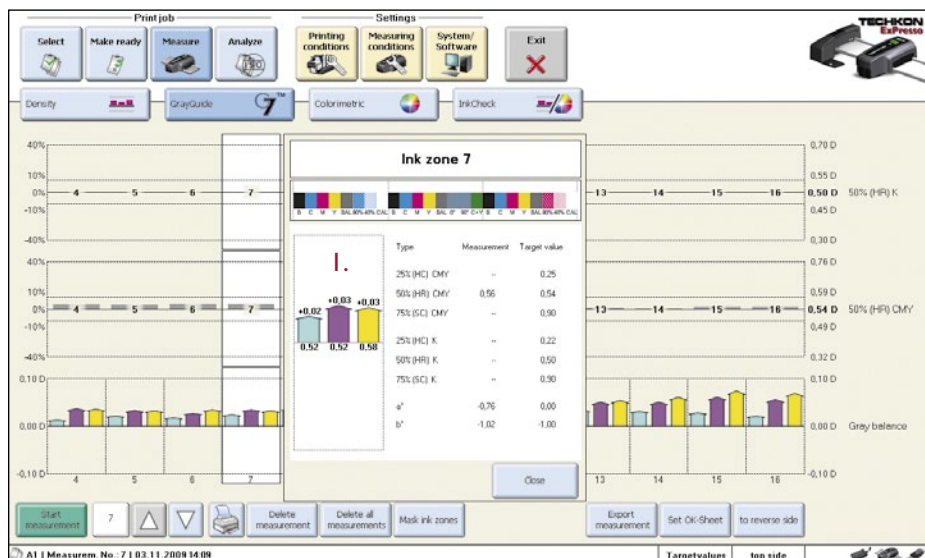


The GrayGuide function is a very useful feature when controlling a printing press according to the Gracol G7™ method, which is especially common in the USA. It requires the use of an appropriate color bar.

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 (I.) shows, that all of the three inks CMY have to be increased to match the Gracol targets.

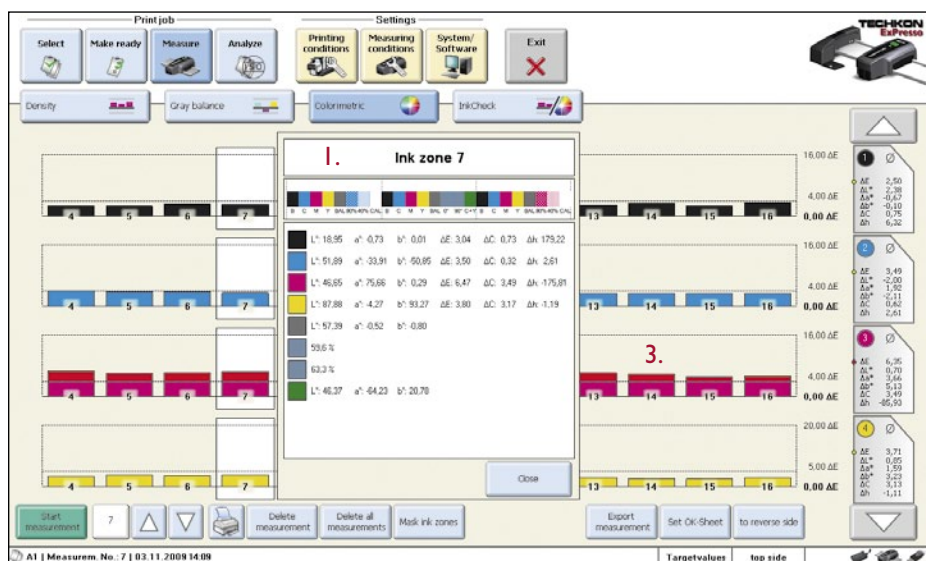


## Measure – Colorimetric (ExPresso Pro)



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  $\Delta E$  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  $\Delta E$  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.

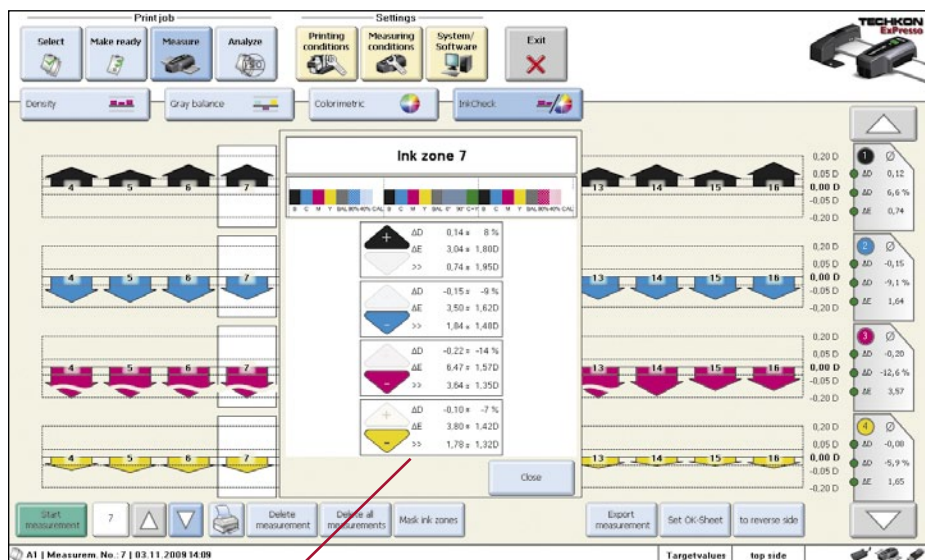
3. Measurement values out of tolerance will be marked with red top.

## 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.



	ΔD	-0,10 ± -7 %
	ΔE	3,80 ± 1,42D
	>>	1,78 ± 1,32D

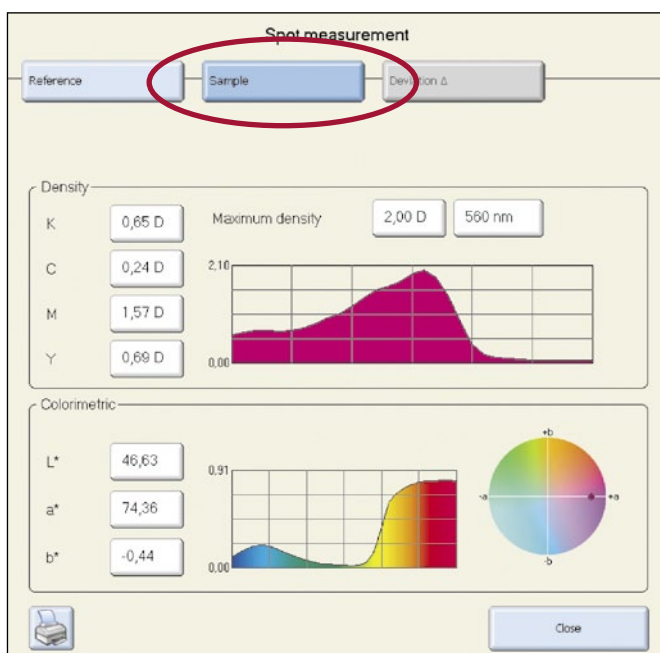
In this case there is too much yellow ink applied in ink zone 7. In order to achieve a lower ΔE, the density has to be reduced by 0,10 from D=1,42 to D=1,32. That reduces ΔE from 3,8 to 1,78.



## 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. An acoustic signal confirms, that the measurement is completed and the measurement data are displayed by the ExPresso software in the window “Spot measurement” in the submenu “Sample”.

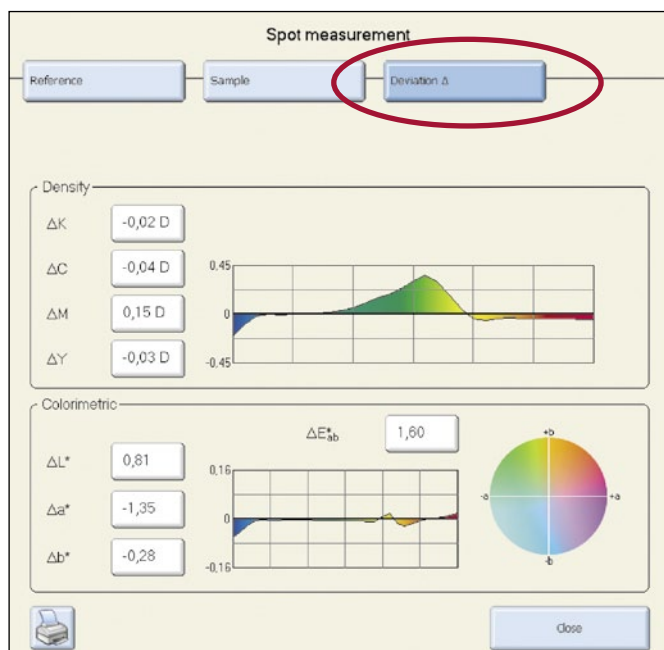
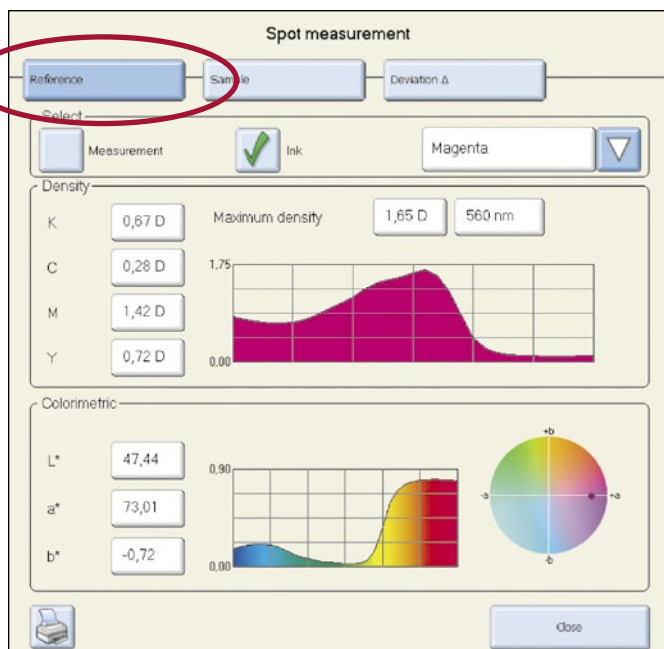
All relevant density- and colorimetric-values are shown here very clearly and can therefore be interpreted at a glance. The maximum density according to the wave length is displayed as well.



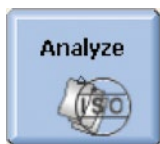
In the menu “Spot measurement → Reference” (see p. 56) a reference can be selected for the measured color. This can be a second measurement or an already defined ink (see p. 27).

The window “Spot measurement → Deviation  $\Delta$ ” (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.





## Analyze

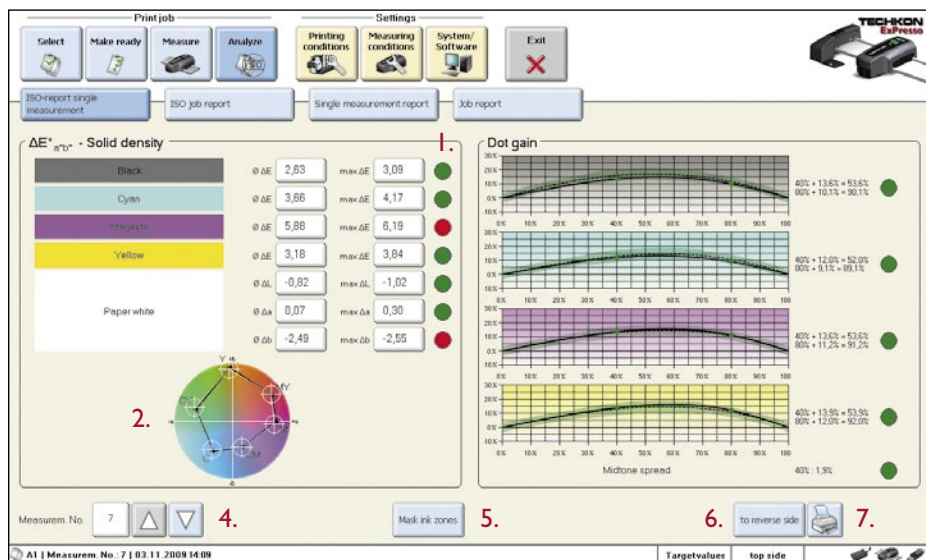


The functions in the “Analyze” menu serve to analyze single measurements or complete series of measurements (print jobs).

“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:  $\Delta E^*_{ab}$ -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.

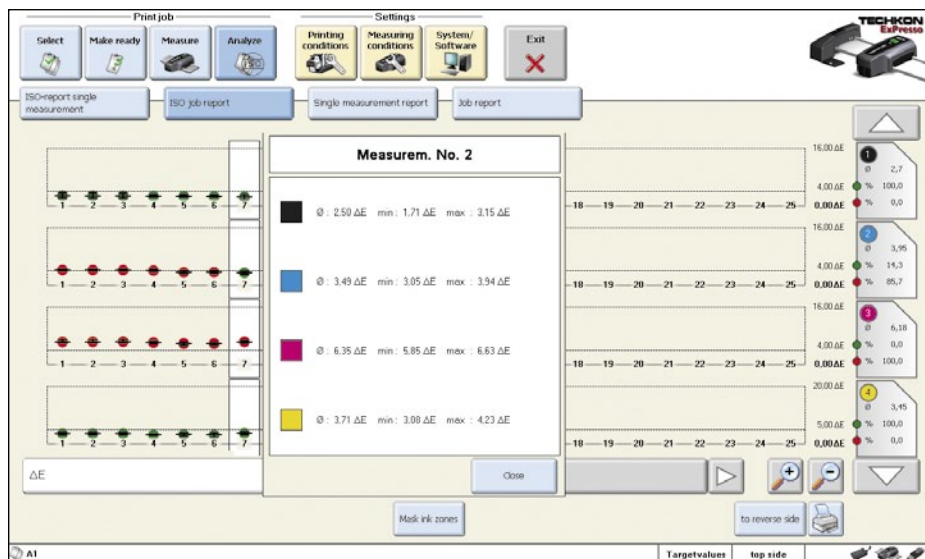
You can choose between a summary (1.) and the display of detailed reports of single parameters, which you can select from the pull-down-window in the lower left corner of the menu window.

The screenshot shows the 'Analyze' menu selected in the top toolbar. Below the menu, a status bar indicates 'top side: 2 Measurements; First measurement: 03.11.2009, 13:26; Last measurement: 03.11.2009, 14:09'.

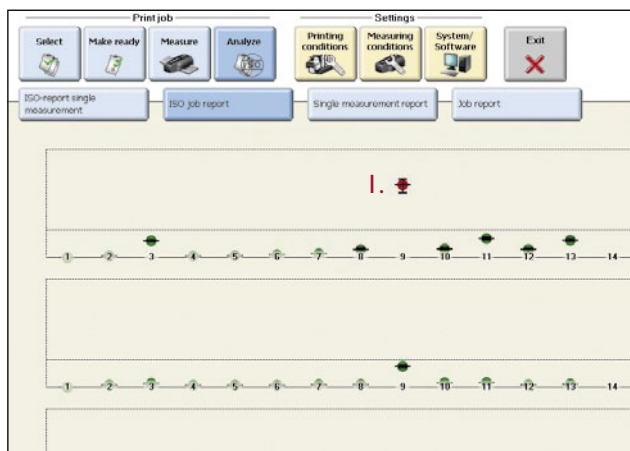
	Black	Cyan	Magenta	Yellow
$\Delta E$	in tolerance	in tolerance	in tolerance	in tolerance
Dot gain 40%	100 % ✓	0 % ✗	0 % ✗	100 % ✓
Dot gain 80%	100 % ✓	100 % ✓	100 % ✓	100 % ✓
Paper white	100 % ✓	100 % ✓	100 % ✓	100 % ✓
Midtone spread			100 % ✓	
Summary				

At the bottom left, there is a pull-down menu currently showing 'Summary'. At the bottom right, there are buttons for 'Mask ink zones', 'to reverse side', and a printer icon.

Window: with detailed information “ISO job report” for  $\Delta E$  and selected measurement no. 7:



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



The example shows a red dot in the measurement series no. 9 (I.), which signals 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.

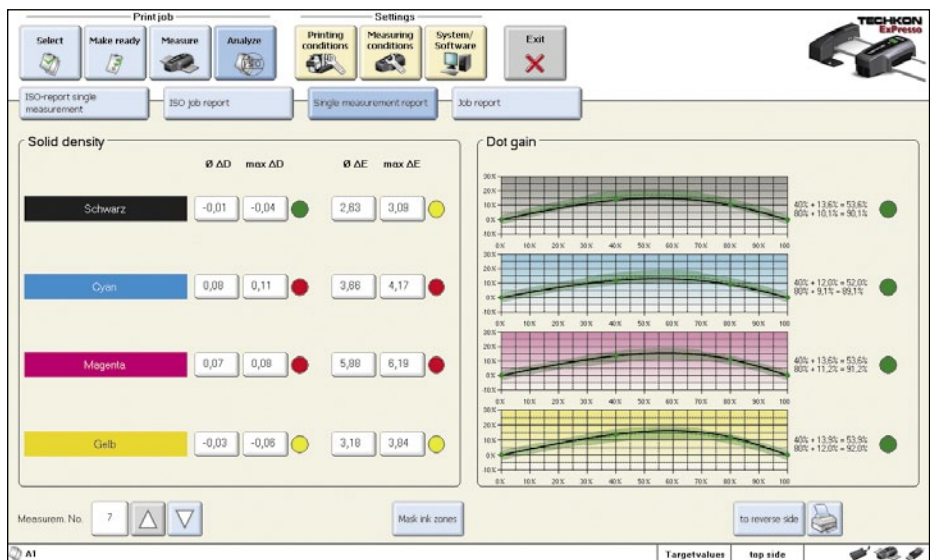
Using the button “Mask ink zones” in the lower part of the menu window (see p. 58) you will switch to the “Mask ink zones” function. Here you can define which OK-sheet will be the starting point for the evaluation of the print job. Optionally a measurement can be selected to serve as starting point.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

## Analyze – Single measurement report

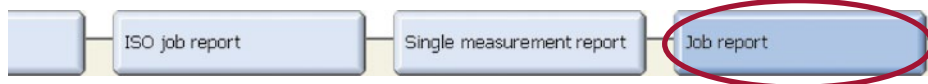


“Single measurement report” can be compared with “ISO-report single measurement”, but the evaluation does not refer to the ISO standard. Therefore the information sections “Solid density” and “Dot gain” refer only to individually defined target sets and tolerances.

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  $\Delta E$  (ExPresso Pro only), which you select by clicking in the pull-down-menu in the lower left corner of the menu window (I.) (see page 58 for further information).

	Schwarz	Cyan	Magenta	Gelb
	in tolerance	in tolerance	in tolerance	in tolerance
Density	100 % ✓	0 % ✗	42.9 % ✗	100 % ✓
Dot gain 40 %	100 % ✓	100 % ✓	100 % ✓	100 % ✓
Dot gain 80 %	100 % ✓	100 % ✓	100 % ✓	100 % ✓
$\Delta E$	100 % ✓	0 % ✗	0 % ✗	100 % ✓

Summary ▼

Mask ink zones

to reverse side

AI Targetvalues top side

## 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 a free USB port and a completely installed Microsoft Windows 2000, XP, Vista or 7 operating system.

#### 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 device is **not** connected to the PC.  
Insert the SpectroConnect CD into the CD drive of the running computer.  
You will find the CD at the back of this manual.
2. The installation routine will start automatically. Follow the steps of the installation, until it is completed.
3. Now, after the installation was finished successfully you can connect the device with the USB cable to the computer.



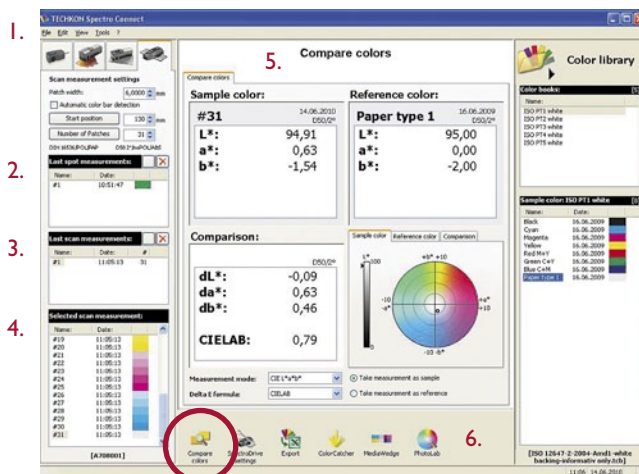
### 4.3 Overview

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



Software symbol  
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.

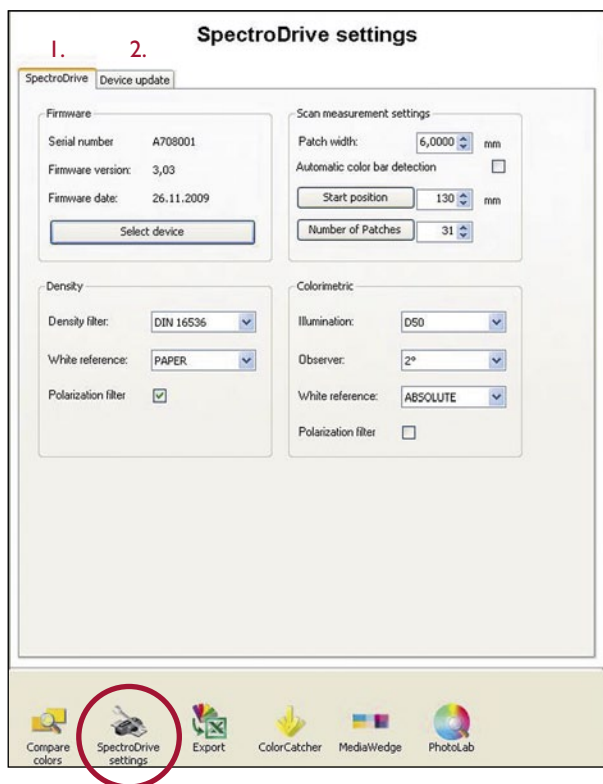
After launching SpectroConnect it is pre-set to display the module “Compare colors”.

## 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. It 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.

In this program window you can also check the firmware version.



## 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**.

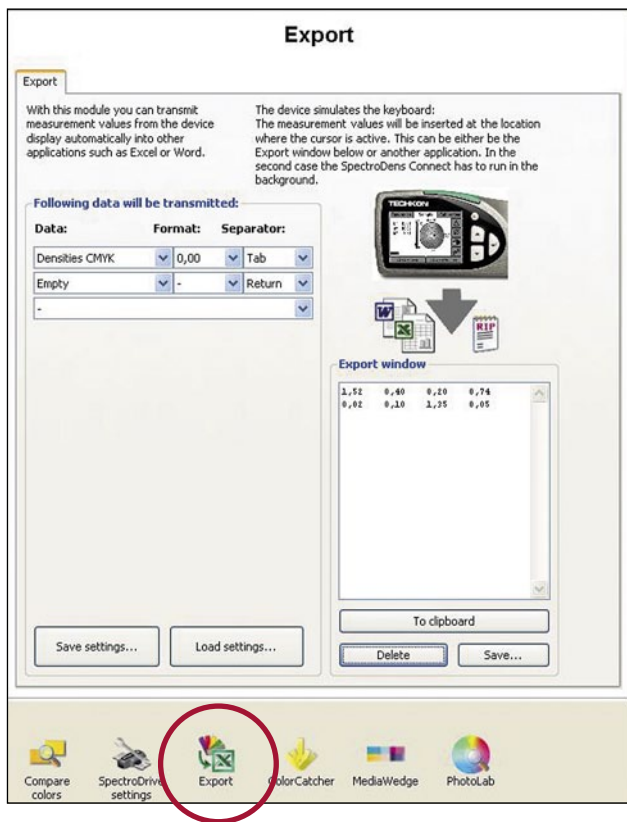
The procedure is explained in the program window:



## 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 place the measurement value automatically at the location where the cursor is.



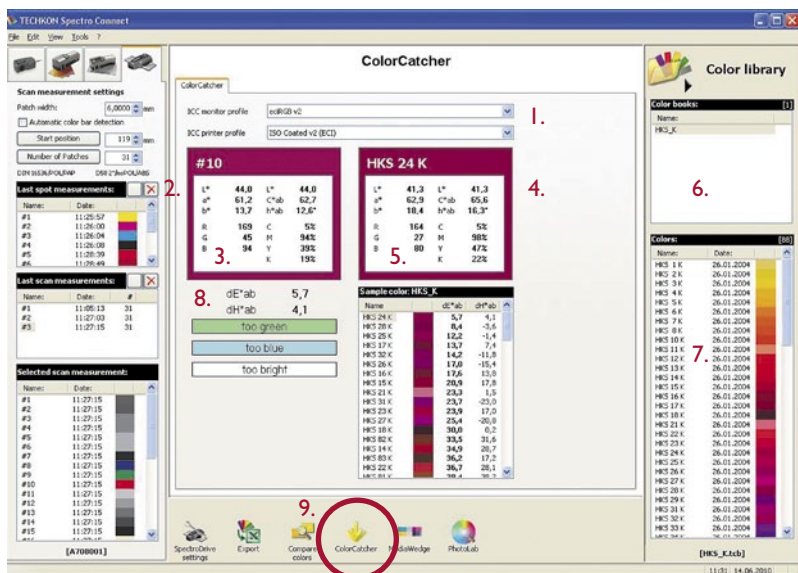
1. Here is defined, which data will be transmitted, how it will be formatted and what type of spacing between the measurement data will be. All the settings can be saved and recalled later.

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

This example shows the transfer of CMYK density values.

## 4.7 Software module “ColorCatcher”

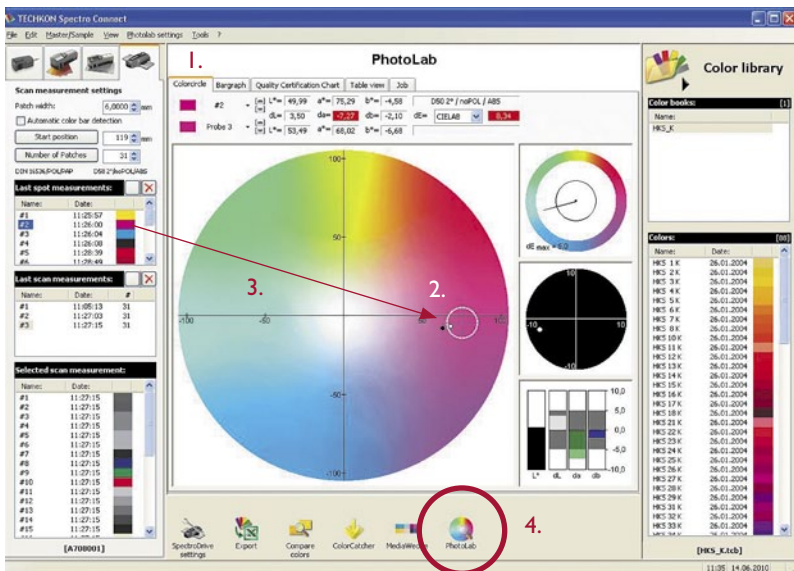
Based on a  $L^*a^*b^*$ -measurement and referring to selected ICC profiles the program module “ColorCatcher” displays the conversion into the color models  $L^*C^*h^*$ , RGB and CMYK. Furthermore an automatic search for the closest matching color of a pre-set or self created color book is carried out. 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
9. Software module “ColorCatcher”

## 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.

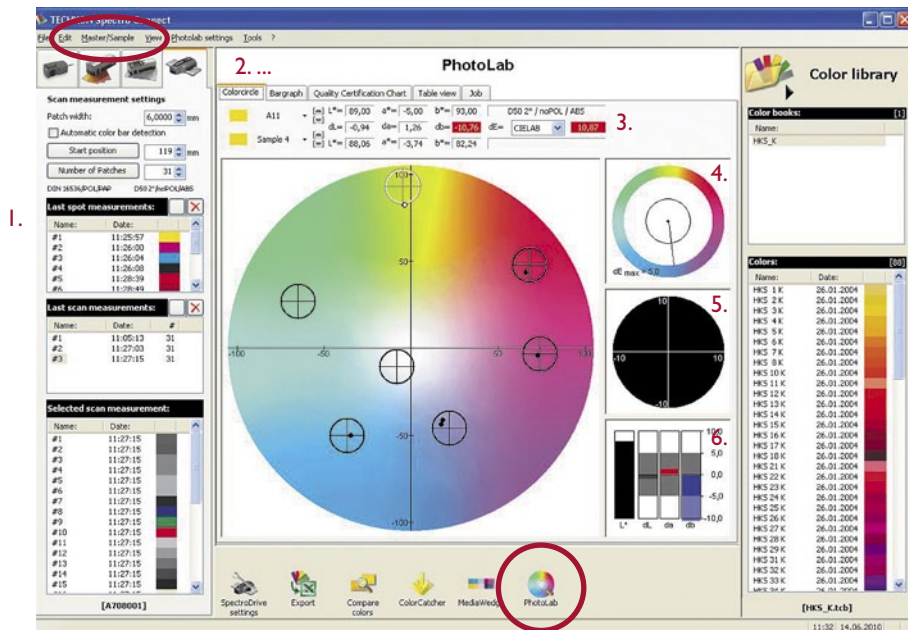
2. Reference: viewfinder with tolerance circle  
Sample: bold point

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  $\Delta L^*$ ,  $\Delta a^*$ - and  $\Delta b^*$ -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.

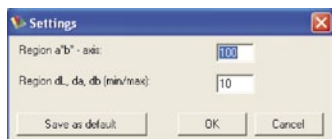
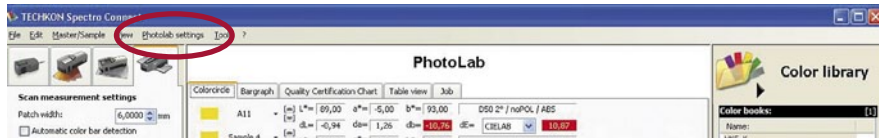
4. The black circle line indicates the tolerance limit of the  $\Delta E^*$ -region. If the black pointer reaches into the outer segment of the circle, the tolerance has been exceeded.

5. Enlarged view of the tolerance circle

6. Display of the color components  $\Delta L^*$ ,  $\Delta a^*$  and  $\Delta b^*$ .

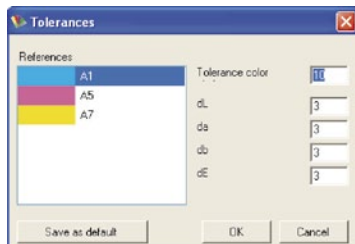
## PhotoLab settings

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.



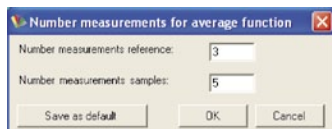
### 1. General settings:

This is the window for setting the dimensions of the  $L^*a^*b^*$ -color circle and the  $\Delta L^*a^*b^*$ -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:

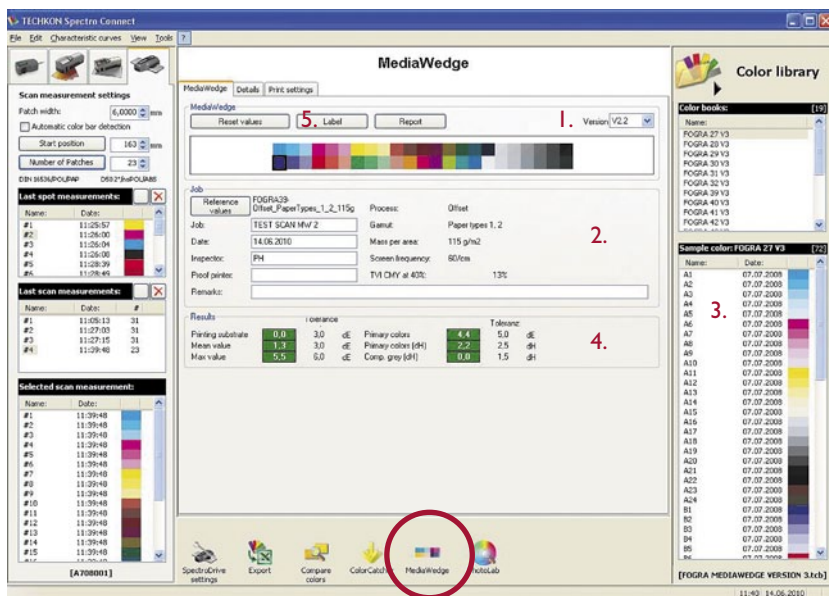
It can be appropriate to take several single measurements on one sample which then are averaged to an average value. The number of measurements which result in the calculation of the average value is defined in this window..



## 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](http://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”.



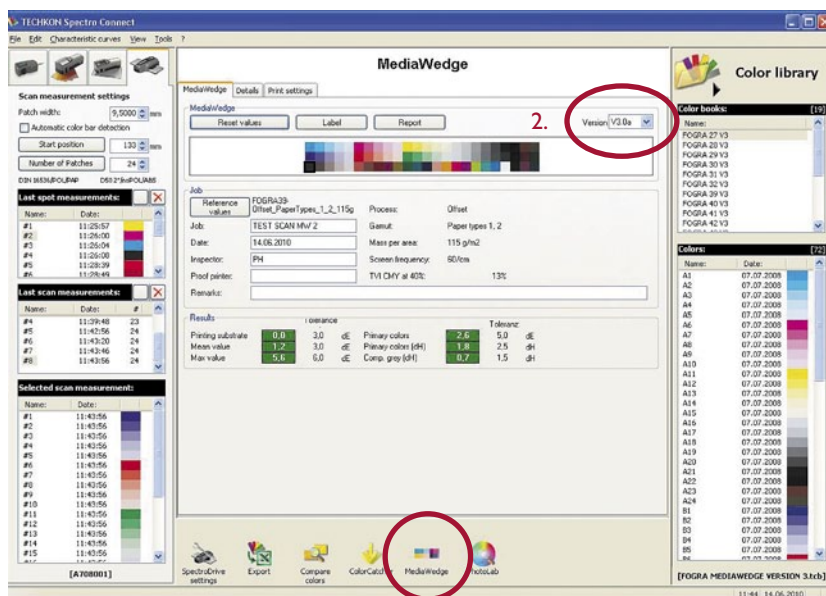
1. Selection of the media wedge version (you will find the version number on the printed test element)
2. Overview of information concerning the print job
3. Selection of reference values

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.

1.

Mediawedge Analysis					
<b>Job:</b>	TEST SCAN MW 3		<b>Inspector:</b>	PH	
<b>Date:</b>	14.06.2010		<b>Proof printer:</b>		
<b>Remarks:</b>					
	dE/dH	Max. Tolerance	Remarks		
<b>Print. Substr.:</b>	0,0	3,0	OK	✓	<b>TECHKON</b> <a href="http://www.techkon.com">www.techkon.com</a>
<b>Mean:</b>	1,4	3,0	OK	✓	
<b>Max:</b>	5,4	6,0	OK	✓	
<b>Primary colors:</b>	2,8	5,0	OK	✓	
<b>Primary col. (dH):</b>	1,1	2,5	OK	✓	
<b>Comp. grey (dH):</b>	0,7	1,5	OK	✓	
<b>Printing and measurement conditions:</b> commercial printing, paper type 1 or 2, i.e. gl. or matt coated art, 115 g/m2, positive-acting plates, periodic screen 60/cm, solids and TVI according to ISO 12647-2:2004 DAM 1 ISO 13655-M1: CIELAB, geometry 0/45 or 45/0, 2° observer, D50, white backing					

1. After the import of the media wedge a short protocol will be generated and can be printed on a self-adhesive label with a Dymo label printer.



2. The software supports also the Ugra/Fogra media wedge in version 3.0.

## Measurement technology

Spectral remission measurement and color density determination to ISO 5-3/4

## Measurement geometry

0/45° optics to DIN 5033

## Spectral range

400 to 700 nm in 10 nm steps

## Measurement aperture

1,5 mm, appropriate for measuring patches with at least 3 mm height and 3 mm width  
UV cut filter optional

## Light source

Gas-filled lamp, type A illumination

## Polarization filter

Twice linear crossed,  
switched on and off per software command

## Measurement time

Approximately 160 mm/s for 4 mm patches (equals approximately 3 seconds for 520 mm sheet length), approximately 400 mm/s for 8 mm patches;  
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 / Standard Observer

A, C, D50, D65, F 2/7/11 / 2°, 10°

## Density filter

DIN 16536, DIN 16536 NB,  
ISO/ANSI T, ISO/ANSI I, ISO E,  
spectral density Dmax

## Density measurement range

0,00 D – 2,50 D

## Dimensions

see page 8

## 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, 1800 mm scan length) on request

## Repeatability

0,01 D  
0,03 CIE  $\Delta E^*_{ab}$ \*

## Inter-instrument agreement

0,01 D  
0,3 CIE  $\Delta E^*_{ab}$ \*

## Data transmission

Module for wireless data transmission with PC-sided USB connection

## Power supply

Rechargeable NiMH battery,  
regulated recharge via charging console with AC adapter; 100 – 240 V, 47 – 63 Hz  
Part no.: FRIWO FW 75550/08

## Weight

Measurement device: 820 grams

## Contents

see page 9

## Software TECHKON ExPresso

Delivery on CD with program protection key (USB dongle) plus CD with TCS Digital  
System requirements: Windows XP, Vista or 7  
Recommended touch-screen: Elotouch 1727L 17"

Functionality of Basic- and Pro-version see page 8

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

## Manufacturer certificate

applicable for ISO 9000 documentation

**Device:** Scan-Measurement System TECHKON SpectroDrive

**Serial Number:**



**Manufacturer:** TECHKON GmbH • Wiesbadener Str. 27 • D-61462 Königstein  
Telephone: +49 (0)6174 92 44 50 • Telefax: +49 (0)6174 92 44 99  
E-mail: [info@techkon.com](mailto:info@techkon.com) • <http://www.techkon.com>

**Certification:** The device is compliant with R&TTE directive 1999/5/EC concerning the electromagnetic compatibility EMC and is provided with the CE label. The device is RoHS compliant (class 9).

Certified Standards:

- EN 300 328
- EN 301 489-1/-17
- EN 60950
- CB scheme (for Europe, North America, Japan)
- R&TTE, Annex IV
- FCC Part 15.247
- Japan Test for Wireless LAN, Ordinance regulating radio equipment (2004-03) Art. 2 item 19
- TCB service for USA, Canada and Japan

**Notice:** This device complies with Part 15 of the FCC Rules [and with RSS-210 of Industry Canada].

Operation is subject to the following two conditions:  
(1) this device may not cause harmful interference, and  
(2) this device must accept any interference received, including interference that may cause undesired operation.

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

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

The supplied AC adapter is according to regulations UL, IP 40, IEC 950 and VDE EN-EC 10. The device is to be used only with original TECHKON SpectroDrive AC Adapter, 7,5 V DC, Part no.: FRIWO FW 75550/08.

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

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

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

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

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

The remission values documented on back of the charging console are derived from a ceramic white standard, which is referenced to measurements taken and certified by the German Institute for Material Testing (Bundesanstalt für Materialprüfung, BAM).

**Standards:** The measurement device is manufactured according to the recommendations of the technical standards DIN 5033 part 1-9, CIE, DIN ISO 16 536 part 1+2 and ISO 5-3.

The accuracy of the device is checked during the manufacturing by spectral measurements on color samples which were measured and certified by the German Institute for Material Testing (Bundesanstalt für Materialprüfung, BAM).

The calculation of colorimetric values is according to the formulas and tables of DIN 6174, DIN 5033 part 1-9 and CIE.

The calculation of densitometric values is according to the formulas and tables of DIN 16527 part 3, ISO 5-3 and the handbook of standardization of the German Printing and Media Industries Federation (Bundesverband Druck und Medien e.V.) and Fogra (Forschungsgemeinschaft Druck e.V.).

D-61462 Königstein

Place

Date

Signature

**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 le produit / si dichiara che il prodotto

**Typ:**

Type / tipo

**SpectroDrive**

**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:**

**EN 50371**

**Ausgabe: 2002**

applied standard / standard appliqué / norma applicata / édition pubblicato

**2. Sicherheit (Artikel 3.1.a der R&TTE-Richtlinie)**

Safety / sécurité électrique / sicurezza elettrica

**angewendete Normen:**

**IEC 60950-1**

**Ausgabe: 2001**

applied standards / standards appliqués /

**EN 60950-1**

**Ausgabe: 2001**

norme applicate / édition pubblicato

### **3. Elektromagnetische Verträglichkeit (Artikel 3.1.b der R&TTE-Richtlinie)**

Electromagnetic compatibility / compatibilité électromagnétique / compatibilità elettromagnetica

#### **angewendete Normen:**

applied standards / standards appliqués /  
norme applicate / édition pubblicato

**ETSI EN 301 489-1 V1.6.1**

**Ausgabe: 2005-09**

**ETSI EN 301 489-17 V1.2.1**

**Ausgabe: 2005-09**

**EN 61000-6-2**

**Ausgabe: 2005**

### **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 send this registration card 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 • Telefax: +49 (0) 6174 92 44 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 Straße 27  
D-61462 Königstein / Germany

via Telefax to: +49 (0)6174 92 44 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)

