

TECHKON
Erfolg ist messbar

Spectro-Densitometer
SpectroDens

Software
SpectroConnect



Manual

TECHKON manuals, technical documentation and programs are copyrighted. Reproduction, translation or transfer to an electronic medium – in whole or in parts – is prohibited.

TECHKON software is the intellectual property of TECHKON GmbH. Purchase of the software grants the user a license for the use on one computer only. Programs may only be copied for back-up purposes.

TECHKON can not be held liable for any damages that may occur by the use of TECHKON products.

The TECHKON team takes great care in producing this manual. Nevertheless, we can not fully guarantee the complete absence of errors. TECHKON GmbH and the authors can not be held liable neither for any possibly incorrect statements nor their consequences.

Products that are not made by TECHKON GmbH are mentioned for information purposes only and such statements do not represent trademark infringement. All registered trademarks are recognized.

TECHKON products and product names are registered internationally under several intellectual patents and trademarks.

Specifications can be subject to change without notice.

Version 4.1, March 2017

You can reach us at the following address:

TECHKON GmbH

Wiesbadener Str. 27 • D-61462 Königstein/Germany

T +49 (0) 6174/92 44 50 • F +49 (0) 6174/92 44 99

info@techkon.com • www.techkon.com



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 SpectroDens.

The manual is divided into three chapters:

CHAPTER 1: How to use TECHKON SpectroDens

CHAPTER 2: Description of the measurement functions

CHAPTER 3: How to use the Windows software SpectroConnect

For the first steps we recommend to read chapter 1; in particular paragraph 1.4.

You will be fascinated that after only 15 minutes you will know how to work with SpectroDens. The second chapter will show you detailed insight into the measurement functions and chapter 3 is about the Windows software SpectroConnect, which is part of the package.

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

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

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

Your TECHKON Team

Content

CHAPTER 1: How to use TECHKON SpectroDens

1.1	Product description	5
1.2	Packing list	8
1.3	Design of SpectroDens	9
1.4	Working with SpectroDens	11
1.5	Care and maintenance	19

CHAPTER 2: Description of the measurement functions

2.1	Measurement functions of SpectroDens Basic.....	33
2.2	Additional functions of SpectroDens Advanced.....	49
2.3	Additional functions of SpectroDens Premium	61
2.4	Storage of measurement values	75

CHAPTER 3: How to use the Windows software SpectroConnect

3.1	Software description	78
3.2	Installation.....	78
3.3	Overview / Software module: Compare colors.....	79
3.4	Software module: SpectroDens settings	80
3.5	Device update and device upgrade	81
3.6	Software module: Export	82
3.7	Software module: ColorCatcher.....	83
3.8	Software module: PhotoLab	84
3.9	Software module: MediaWedge.....	87
3.10	Software module: Transfer curve.....	89
3.11	Software module: ISO-Report	91
3.12	Software module: SpectroChart.....	92
3.13	Software module: SpectroCheck	93

APPENDIX:

Specifications

Manufacturer certificate

EC-Declaration of Conformity

Registration card

Chapter 1

How to use TECHKON SpectroDens

1.1 Product description

With the new SpectroDens generation TECHKON continues the success story of the SpectroDens hand-held devices in the long term. The dictum during product development was: Pursue proven concepts and integrate new meaningful technologies. The result sets a new standard.

A measurement device for all applications

SpectroDens is an all-purpose measurement device, that is universally used for quality control in the printing industry as well as for other tasks, where colors have to be judged critically. SpectroDens is exceptionally suitable, no matter which application. Thanks to the individually adjustable display functions, you can quickly set up the device for your particular job. The solid aluminum unibody case makes the device a reliable tool even in a harsh industrial environment. Direct positioning of the measurement head on the measurement field ensures a secure and quick measurement. In addition to single measurements you can easily carry out scan measurements. Tracking wheels on the bottom of the device make it possible to scan very fast up to 200 color patches at once on a print control strip or test chart.

Two devices in one

As a spectro-densitometer, SpectroDens combines the qualities of a highly accurate spectro-photometer and an easy-to-use densitometer. Measurement is spectral, i.e. the entire color information – the spectral fingerprint of the color – is precisely registered. The data is converted into measurement data for descriptive analysis and display:

- Densitometric data is widely used in quality control during the printing process.
- Colorimetric data is used in the evaluation of print proofs, the creation of color profiles in color management as well as the color matching and formulation of inks.

Densitometry / Density measurement

A push of a button provides you with solid density as well as all useful additional information such as dot gain, dot area, gray balance and print contrast. In the automatic measurement mode the device always displays the relevant information instantly. You can even quickly and easily produce complete printing curves. The spectral measure-

ment technology calculates not only density values for CMYK, but also exact data for the density of spot colors.

Colorimetry

All standard colorimetric functions are displayed clearly. Even the entire CIE L*a*b* color circle appears in the high resolution color display. As a result understanding CIE L*a*b* values becomes very easy and clear. In the color library 25.000 reference colors and complete digital color books can be saved.

Standardized measurement

Thanks to its ISO-compliant measuring head SpectroDens works strictly according to the standards valid for the graphic industry. Select different status filters for density measurement in the device settings. A special technical feature is the polarization filter which can be switched on and off by a push of a button and makes SpectroDens particularly good at evaluating the Ugra/Fogra media wedge.

Using the latest LED technology SpectroDens provides D50 illumination and therefore fulfills the M0, M1, M2, M3 measuring conditions in accordance to ISO 13655. The lifetime of the LED illumination is nearly unlimited. Moreover the new design of the direction-independent measuring head provides reliable measurements of a wide range of print media.

Software SpectroConnect

The supplied Windows-software TECHKON SpectroConnect provides the connection between SpectroDens and the PC via the micro-USB connector or via the optionally available WLAN-module. Measurement data can thus be comfortably processed on the PC and transferred, for example, to Microsoft Excel™.

Use the color library to load complete digital color books quickly and easily into the device. An import of color values in CXF® format is possible as well. SpectroConnect is also the connecting module for other applications, e.g. programs for the production of printing curves, for colorimetric quality control or for checking the compliance of printing products to ISO standards.

Three different performance packages

We supply SpectroDens in three types of performance packages: The model **Basic** with all density functions and the **Advanced** version which adds essential colorimetric functions and a color library. The fully equipped flagship model SpectroDens **Premium** meets all demands with regard to quality control.

All SpectroDens devices can also be used for scans and feature a brilliant color display. Optionally data transmission by means of a WLAN module is possible.

SpectroDens can be upgraded post-purchase by program upload to higher versions (charged service).



SpectroDens Basic

- Automatic density
- Density CMYK (with reference measurements)
- Dot area
- Dot gain
- Print contrast
- Gray and color balance
- Ink trapping
- Printing curve
- Density spectrum
- Spectral density for spot colors
- Trend function ExPresso mini
- Slur/doubling
- Dot area to Yule-Nielsen for printing plates
- LED technology provides measurement conditions M0, M1, M2, M3 according to ISO 13655

SpectroDens Advanced

Same functions as SpectroDens Basic and additionally:

- CIE $L^*a^*b^*$
- $\Delta E^*a^*b^*$
- CIE $L^*C^*h^*ab$
- CIE XYZ
- CIE color circle
- ΔE^*cmc
- ΔE^*CIE94
- $\Delta E^*CIE2000$
- Remission spectrum
- InkCheck: Color control of spot colors
- Color library with up to 20 color books and a total number of 25.000 reference values
- Memory capacity for 3.000 sample values and 300 reference values
- Gray-Guide according to Gracol G7™

SpectroDens Premium

Same functions as SpectroDens Advanced and additionally:

- Ugra/Fogra media wedge evaluation
- ISO-Check: Color control according to ISO 12647
- CIE $L^*u^*v^*$
- CIE $L^*C^*h^*uv$
- CIE xyY
- DIN Lab99
- Metamery index
- Whiteness
- Yellowness
- Pass/fail tolerance
- Opacity
- OBA-Check
- Average

1.2 Packing list

Contents of delivery

- Measurement device SpectroDens
- Charging console with integrated absolute white standard
- AC adapter with universal plugs for Europe, UK and USA
- This manual with ISO 9000 compliant certificate
- Manufacturer certificate
- Micro-USB cable for PC connection
- CD with Windows software TECHKON SpectroConnect



Contents of delivery of SpectroDens

Optional accessories

- Exchangeable apertures
- Print control strips TECHKON TCS
(the digital print control strips TECHKON TCS can be downloaded free of charge at www.techkon.com)
- Device upgrades for **Basic-** or **Advanced** models to higher functionality
- Color reference SpectroCheck
- WLAN module

Replacement parts

- Charging console with white standard
- AC adapter
- Rechargeable battery

You will find the technical specifications in the appendix of this manual.

1.3 Design of SpectroDens

SpectroDens is a solidly designed measurement device which is very functional and easy to use. It is compact in size; the buttons can be reached with the right index finger when the device is held with the right hand. The LCD display is inclined towards the user, so the display information can be read clearly.

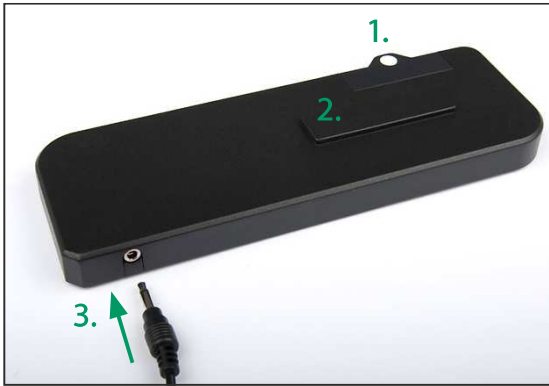
SpectroDens can be easily positioned on the measurement sample.



The device incorporates a high-resolution spectral sensor which analyzes the color spectrum of the measured sample. The spectral data is the base information for calculating densitometric and colorimetric data which is displayed. Densitometric values can be solid density, dot area, dot gain or trapping values. Colorimetric values are typically CIE L*a*b*- or ΔE^* -color information.

The USB-connector is for linking with a PC. The USB-cable with a Micro-USB plug, which fits into the connector at the back of the device, is part of the package.

The charging console incorporates an absolute white standard, which should not be touched but should always be kept clean.



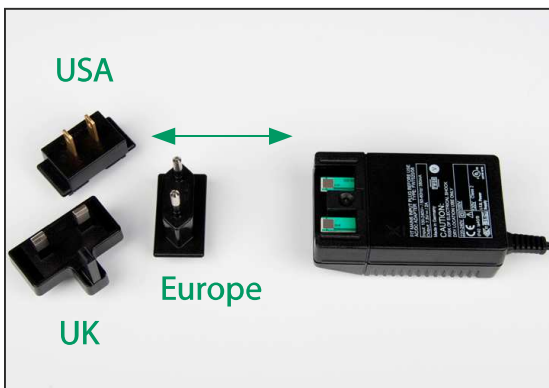
1. Absolute white standard
2. Charging contacts for wireless, inductive battery charging
3. Low voltage connector for the plug of the AC adapter

The above image shows how to connect the plug of the AC adapter with the charging console. The AC adapter can be used universally for 100 – 240 V and 47 – 63 Hz.

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

Connect the mains plug to the power socket. The socket must be located near the facility and must be easily accessible. Do not use the power plug if the power cord is damaged.

Always use the original TECHKON SpectroDens AC adapter. The use of other power sources is hazardous.



AC adapter with three different mains plugs



Device in the state of charging

1.4 Working with SpectroDens

Switching on and off

SpectroDens is switched on by pressing the green measurement button. It is immediately ready to measure. In this state power consumption is very low.

If no button is pressed within one minute, the device will switch off automatically. Switching it on again with the green measurement button will show on the display the last measurement done. There is no button to turn SpectroDens off.

Charging

The **battery status** is displayed as a battery symbol in the upper right corner of the LC-display, when the unit is turned on.

When the battery turns empty, the battery symbol turns to red. In this state several measurements still can be obtained; but it is time to put it on the charging console to avoid a total discharge and damage of the battery.

Charging starts automatically by placing the device on the charging console. Please keep the charging contacts on the console and under the device always clean. Five seconds after placing the device on the console the display will show an animated battery symbol. When the symbol displays a full battery, the charging is completed and the battery is fully charged.

Up to 10.000 measurements can be carried out with one battery charge. Completely charging an empty battery will take approximately four hours.

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

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

You can park the device on the charging console when not in use. This way it is guaranteed to have always an operational measurement instrument at hand.

How to measure

After switching on SpectroDens, it is instantly ready to measure. Just position the measurement aperture on top of the measurement sample and press shortly with the index finger the green measurement button. Within one second the resulting measurement value will appear on the display of the device.

Please ensure that the device always has a firm stand on a 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. On the bottom of the device there are tracking wheels which allow to drive easily and fast to the measurement point.

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 proofs and
- black backing for prints.

TIP:

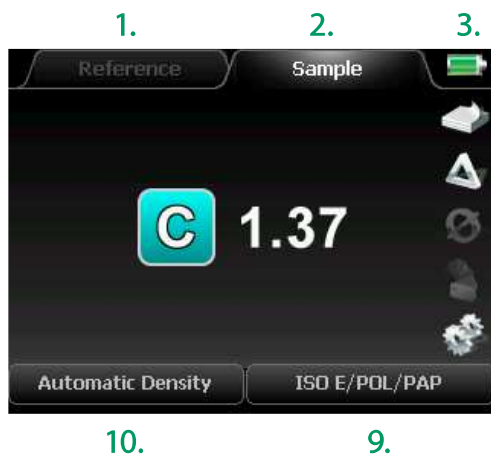
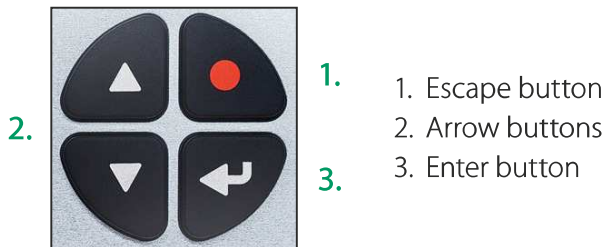
By pressing the red Escape button and one of the Arrow buttons simultaneously (see p. 13), SpectroDens switches directly between the densitometric and the colorimetric measurement function that was last used.

Device settings with the display menu

Thanks to the interactive device menu, settings are very easy to adjust. The display is divided logically into a center and a frame. The center displays the measurement results. It is framed by interactive “soft keys” and status information displays. Pressing shortly on one of the arrow buttons will move an active cursor from “soft key” to “soft key” around the frame. An active “soft key” is indicated by a frame.

By keeping an arrow button pressed, the cursor travels from “soft key” to “soft key” at a constant speed until the arrow button is depressed again. By pressing the enter button a function behind a “soft key” is selected and a selectable menu appears. Within such a menu again the navigation is done via the arrow buttons and the selections are made with the enter button. Some menu items or “soft keys” might be shaded in appearance and can not be selected, because they are only active in a higher performance package (Advanced or Premium) of SpectroDens.

Pressing the red, round escape button will always bring you one step back in the menu or will close a menu window. It can be compared to the escape button or undo-function on a PC. It will always bring you back to the measurement mode.



The center of the display shows the current measurements.

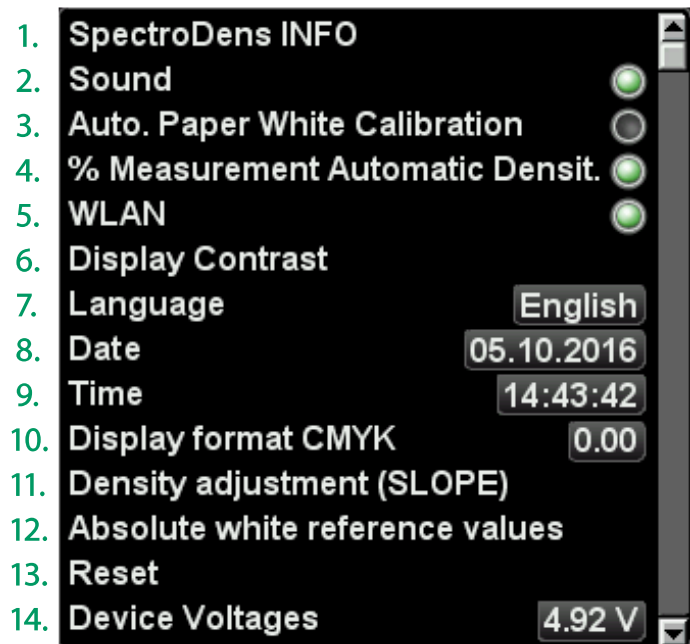
1. Reference measurement
2. Sample measurement
3. Battery and charging status
4. Stack of paper icon for paper white calibration;
CAL icon for absolute white calibration
5. DELTA-mode (= for comparisons)
6. Average function
7. Color library
8. Device settings
9. Measurement conditions
10. Measurement functions

Menu: Device settings



The “soft key” with the cogwheel symbol opens the window for the device settings.

Within this window you can navigate with the arrow buttons and select with the enter button. The red escape button brings you back to the measurement mode.



1. The **SpectroDens INFO** screen informs about the type of device (Basic, Advanced or Premium), the software- and hardware-version as well as the serial number. It also indicates whether a WLAN module is installed and informs about device checks.



2. **Sound** will activate an acoustic signal after each measurement.

3. With activated **Automatic Paper White Calibration** SpectroDens will always perform automatically a paper white calibration when a measurement on a paper white is made.

We recommend to activate this function only when the substrate to be printed is often changed.

Menu: Device settings



4. In the measurement function **Automatic Density**, the device recognizes %-patches, switches automatically to the display of the dot area and shows the calculated values.

The automatic switch to %-values can also be turned off using the device setting **% Measurement Automatic Density** to avoid switching caused by fluctuation. When the function is deactivated, the device will always show the density values and the dot area will not be calculated automatically.

5. SpectroDens can be connected to a **WLAN** network to send information via wireless data transmission to the PC. The WLAN module is available as optional accessory.

6. The **Display Contrast** can be turned darker or brighter.

7. Sets the menu **Language** of the device.

8./9. All measurement values get a **Date-** and **Time-stamp**. This information will be visible when the data is transmitted to the PC software SpectroConnect.

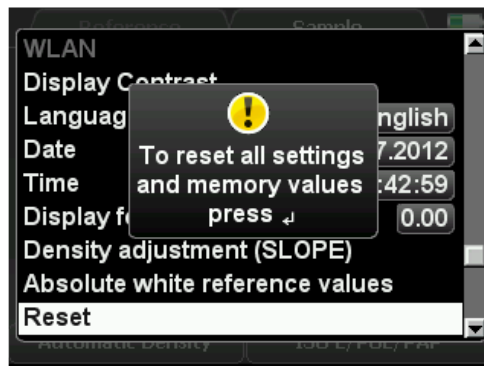
10. For the measurement of densities, the **Display format CMYK** can be selected. The device can display two or three decimals. The information in the chosen format is carried out in all density modes.

11./12. The functions **Density adjustment (SLOPE)** and **Absolute white reference values** are for the internal device adjustment. The device is correctly adjusted by the factory and changes of these settings should be made only in special cases (see page 20 f.: Setting of the Density adjustment (SLOPE)).

13. A **Reset** puts the device to factory settings.

Attention! All stored measurement values and a recently made calibration will be deleted and should therefore be saved on the PC if necessary, by using the Windows software SpectroConnect.

Only the factory-set calibration values are still valid. A reset may be useful, if SpectroDens does not work properly.

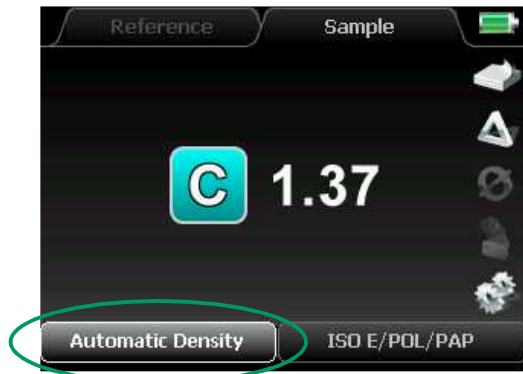


14. The information of **Device Voltages** is for device diagnosis by service personnel.

Menu: Measurement functions

When the “soft key” in the left section of the lower bar is activated, a window opens where you can select the measurement functions.

The measurement functions listed below are described in detail in chapter 2.



Index of the measurement functions:

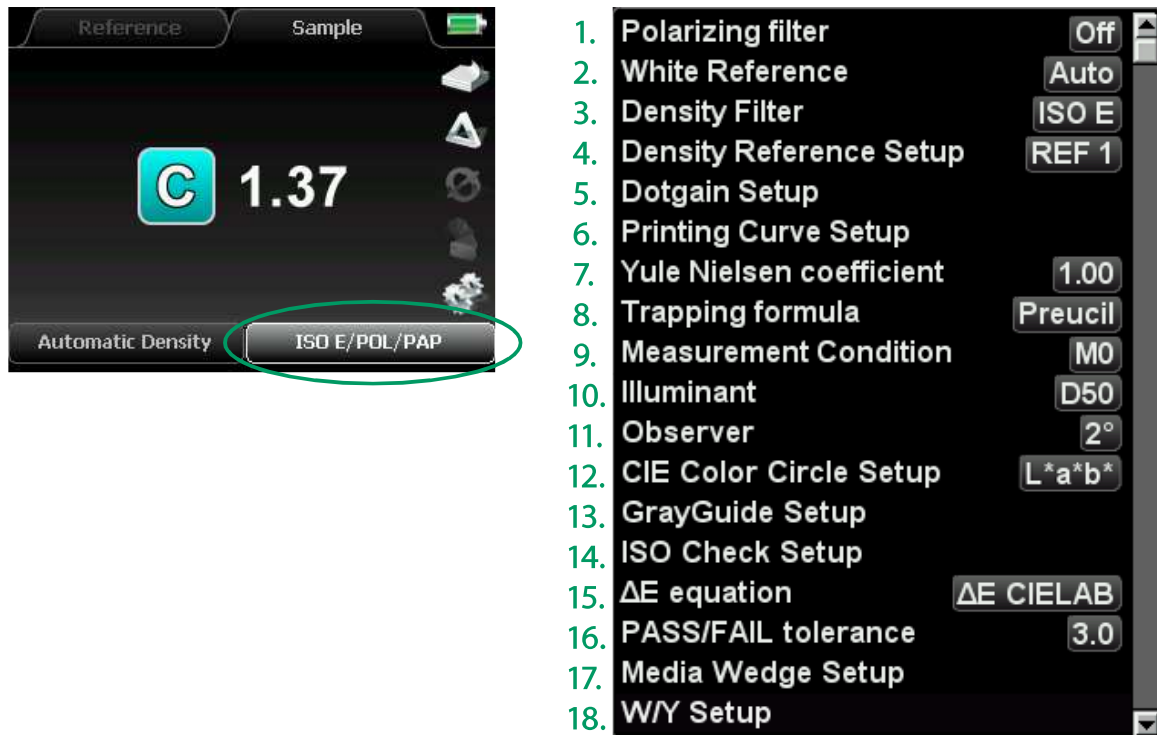
- | | | |
|-----|----------------------|-------|
| 1. | Automatic Density | p. 33 |
| 2. | Densities CMYK | p. 36 |
| 3. | Dot Area | p. 37 |
| 4. | Dot Gain/Contrast | p. 38 |
| 5. | Trapping | p. 39 |
| 6. | Printing Curve | p. 40 |
| 7. | Printing Plate | p. 41 |
| 8. | Slur and Doubling | p. 43 |
| 9. | Density Graph | p. 45 |
| 10. | ExPresso Mini | p. 46 |
| 11. | CIE L*a*b* | p. 49 |
| 12. | CIE Color Circle | p. 51 |
| 13. | Gray Guide | p. 52 |
| 14. | Remission Curve | p. 57 |
| 15. | InkCheck | p. 58 |
| 16. | CIE XYZ | p. 60 |
| 17. | CIE L*C*h* ab | p. 60 |
| 18. | ISO-Check | p. 61 |
| 19. | CIE L*u*v* | p. 65 |
| 20. | CIE L*C*h* uv | p. 65 |
| 21. | CIE xyY | p. 65 |
| 22. | DIN Lab99 | p. 65 |
| 23. | Metamerism-Index | p. 66 |
| 24. | Whiteness/Yellowness | p. 67 |
| 25. | PASS/FAIL | p. 68 |
| 26. | Media Wedge | p. 69 |
| 27. | Scan | p. 70 |
| 28. | Opacity | p. 72 |
| 29. | OBA-Check | p. 73 |

1. Automatic Density
2. Densities CMYK
3. Dot Area
4. Dot Gain/Contrast
5. Trapping
6. Printing Curve
7. Printing Plate
8. Slur and Doubling
9. Density graph
10. ExPresso Mini
- CIE -----
11. CIE L*a*b*
12. CIE Color Circle
13. GrayGuide
14. Remission curve
15. InkCheck
16. CIE XYZ
17. CIE L*C*h* ab
18. ISO-Check
19. CIE L*u*v*
20. CIE L*C*h* uv
21. CIE xyY
22. DIN Lab99
23. Metamerism-Index
24. Whiteness/Yellowness
25. PASS / FAIL
26. Media Wedge
27. SCAN
28. Opacity
29. OBA-Check

Menu: Measurement conditions

When the “soft key” in the right section of the lower bar is activated, a window opens where you can set the measurement conditions which define the parameters of the measurement, e.g. which filter will be applied.

The measurement conditions 4. – 18. are described in detail together with the corresponding measurement functions in chapter 2.



1. The device has an integrated **Polarizing filter**, which can be activated or deactivated by a push of a button. Polarizing filters compensate for measurement differences between glossy and non-glossy surfaces (e.g. freshly printed and dried sheets). The technical standards in Europe recommend the use of such a filter for densitometric measurements. On the other hand, colorimetric measurements (e.g. L*a*b*-measurements) should be taken without a polarizing filter.

By selecting **Auto** from the menu, this will be taken into account and there will be automatically the right filter setting.

2. There are two possibilities for defining the **White Reference**: Density measurements usually are referred to the white value of the paper printed on. Colorimetric measurements

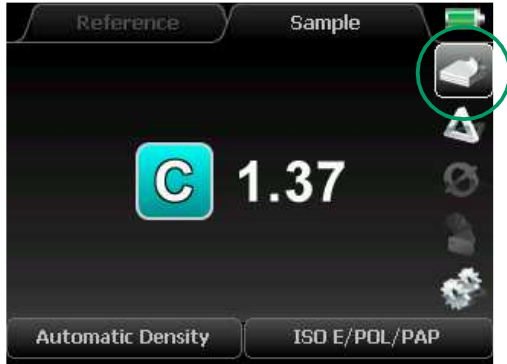
refer to an absolute white reference which is supplied as a ceramic tile on the charging console.

By selecting **Auto** from the menu, there will always be the right setting according to the measurement mode which is selected.

3. Depending on the regional technical standards different **Density Filter** settings are required. SpectroDens as a powerful spectrophotometer has the great advantage that any filter specification can be exactly calculated out of the spectral data. There is no limitation known from conventional filter based densitometers with fixed filters built in.

In Europe filter ISO E is to be selected as the standard filter.

Menu: Calibration



Prior to every series of measurements a calibration should be carried out. After a calibration the device is long term stable, however it is recommended to perform a calibration before starting a new measurement task just to be sure the device is working properly.

For density measurements the calibration is carried out on paper white. This will ensure that the density values are in direct ratio to the ink thickness which is applied on the paper. When there is a change in the paper type, a new calibration has to be done. Only in a few cases density measurements are referenced to an absolute white standard.

A calibration is as easy to carry out as a measurement: Select the “soft key” **Calibration** and place the device with the measurement head on top of a blank area of the paper sheet. The calibration can be started now by pressing either the enter button or the green measurement button.

After one second there will appear a window with the message that the calibration has been done. The device is now ready for measurements. The message window will disappear with the next measurement.

During the calibration process always take care that the instrument is on a flat, stable surface and that the material backing the paper is the same as for the following measurements (white, gray or black). When the paper sample is printed on both sides, it is recommended to use a black backing material in order to avoid mismeasurements due to color shining through the back of the opaque paper.

1.5 Care and maintenance

SpectroDens 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! Keep it always at a safe place, for example in the carrying case.

Cleaning

The measurement head with the optical system is sealed against dust and dirt. 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. For easy cleaning the aperture can be taken off from the measurement head by unscrewing three screws with a special TORX T6 screwdriver (which is part of the package of a spare aperture set).

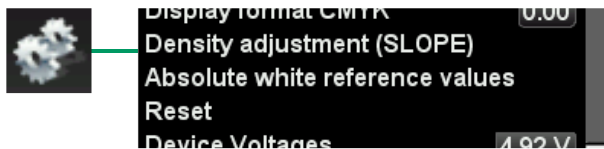
Clean the device casing and the display window only with a soft cloth and a non-aggressive plastic cleaner. Never use alcohol or chemically aggressive solvent-based cleaners which can destroy the surfaces. The same procedure is valid for the white standard which is integrated in the charging console. If the white standard should be defective, it has to be replaced completely.

Should the display window show small scratches, these can be polished out with special display polish greases as they are e.g. available for mobile phones and other electronic equipment as well.

Please do not stick any labels at the bottom of the device. This could lead to faulty measurements, because the direct contact – which is important for the correct optical field of depth – might not be maintained. The battery charge can be affected by a label as well.

Device adjustment

Should SpectroDens do not work properly, first check, if all instrument settings and measurement conditions are set correctly. Especially the settings of the **Density adjustment (SLOPE)** and the **Absolute white reference values** influence the measurement result.

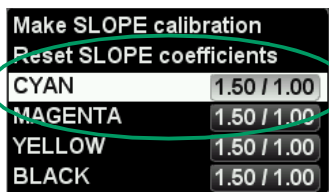


Setting of the Density adjustment (SLOPE)

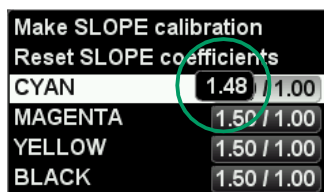
With the **SLOPE correction** values it is possible to adjust SpectroDens to the density values of other devices.



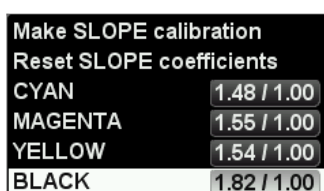
Activate the "soft key" with the cogwheel icon and select the menu item **Density adjustment (SLOPE)**.



Select the menu item **CYAN**.




Enter the Cyan value, you find on the calibration chart. By pressing the arrow buttons the value can be increased or decreased.




In the same way enter the data given by the calibration chart for Magenta, Yellow and Black.

Make SLOPE calibration	
Reset SLOPE coefficients	
CYAN	1.48 / 1.00
MAGENTA	1.55 / 1.00
YELLOW	1.54 / 1.00
BLACK	1.82 / 1.00

Select the menu item **Make SLOPE calibration**.


**Please place the instrument
 on paper white
 and press the green START button
 Press the red button to cancel**

Carry out a paper white calibration as described in the device display.


**Please measure
 CYAN, MAGENTA,
 YELLOW and BLACK**

Now measure consecutively the solid patches of Cyan, Magenta, Yellow and Black.

CYAN	
MAGENTA	
YELLOW	
BLACK	

A correct measurement is indicated by a green dot behind the respective color.

Make SLOPE calibration	
Reset SLOPE coefficients	
CYAN	1.48 / 1.07
MAGENTA	1.55 / 1.06
YELLOW	1.54 / 1.15
BLACK	1.82 / 0.99

The SLOPE correction values are shown.

Make SLOPE calibration	
Reset SLOPE coefficients	
CYAN	1.48 / 1.07
MAGENTA	1.55 / 1.06
YELLOW	1.54 / 1.15
BLACK	1.82 / 0.99

A reset of the SLOPE correction values is done by activating the menu item **Reset SLOPE coefficients**. You reset the device back to its original factory settings.

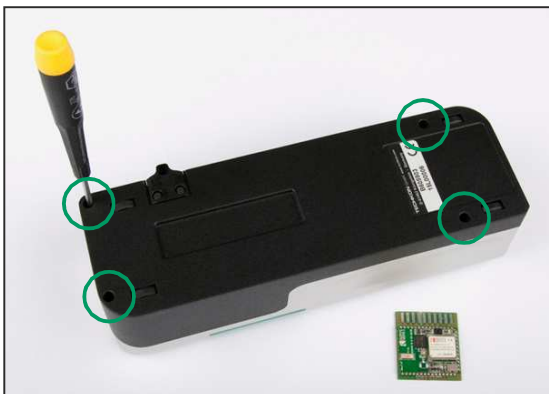
Setup of the SpectroDens WLAN connection

To be able to use the WLAN function in SpectroDens, a WLAN module has to be installed. The module is available as accessory from TECHKON. It is a small electronic board which can be inserted into the instrument easily.

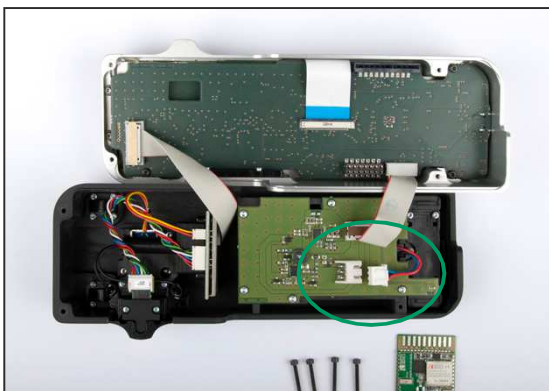
Assembly of the WLAN module



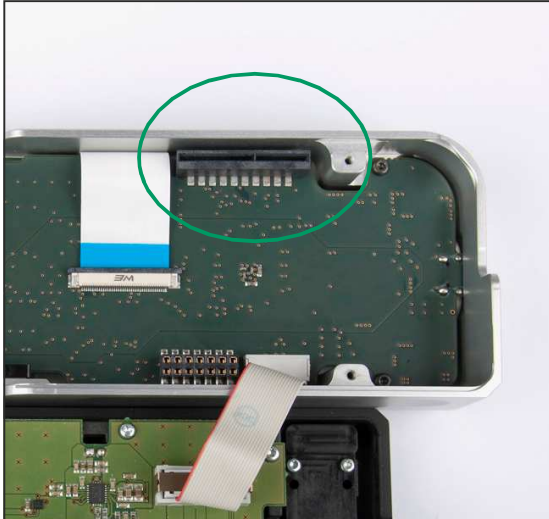
SpectroDens WLAN module



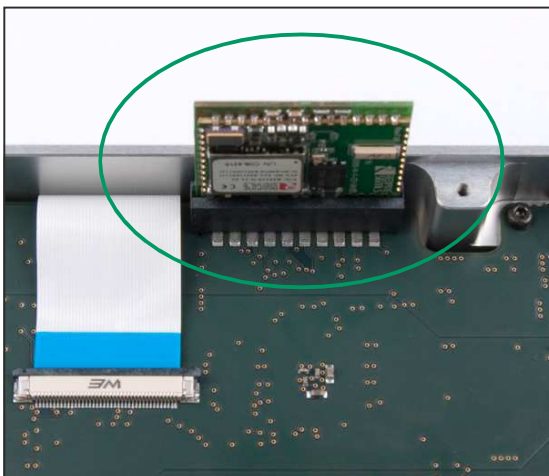
To insert the module the casing has to be opened.



Lift the upper case carefully and put the two casing parts side by side on the table.



The slot into which the WLAN module has to be inserted is located on the main board.



Due to its reverse battery protection the board cannot be inserted in a wrong way.

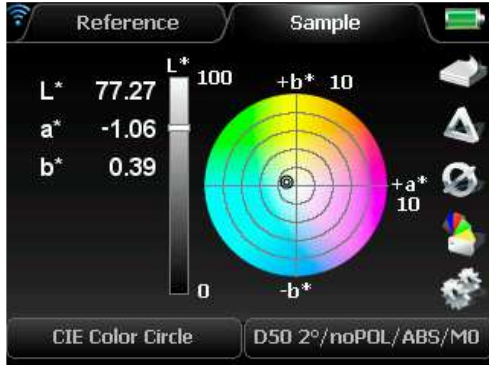
After the WLAN module is inserted in its slot, connect the battery cable again. The plug has to clip into the socket.



When putting the casing together, make sure the WLAN module fits properly in its compartment.

Tighten carefully all four screws on the bottom of the device. Now the instrument is ready to use.

Configuration of the device

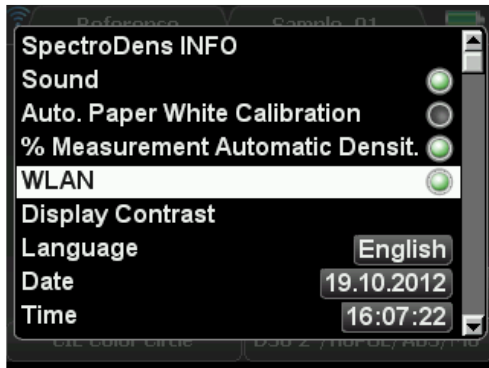


In the upper left corner of the device display the WLAN symbol will be shown when activated.

The color of the symbol depends on the status.

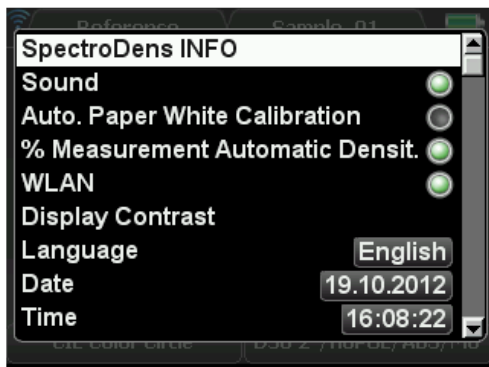
Gray: Searching

Blue: Connection established



To be able to use the WLAN connection, the function has to be activated in the settings of the instrument.

Notice: To save power, it is recommended to turn off WLAN if not required.

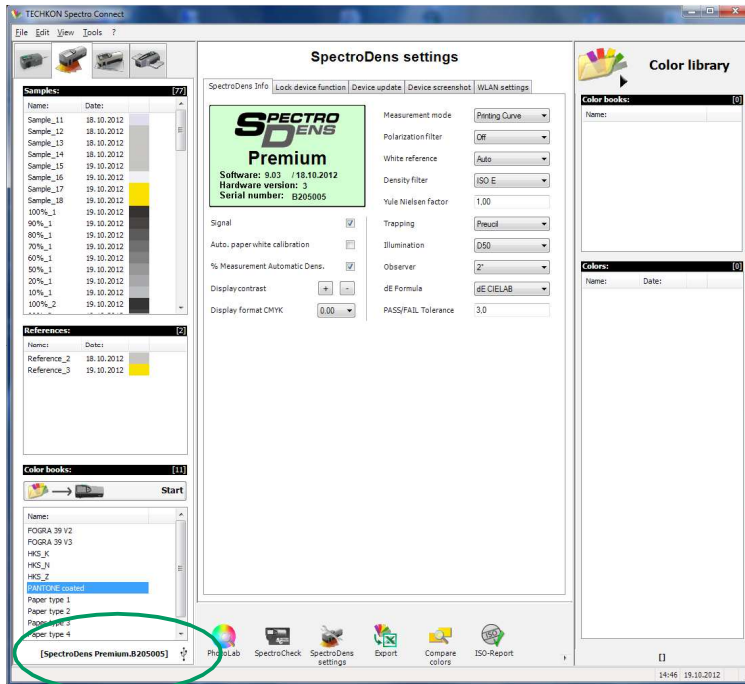


After a successful connection with the software SpectroConnect, the WLAN information can be checked in the **SpectroDens INFO** window.

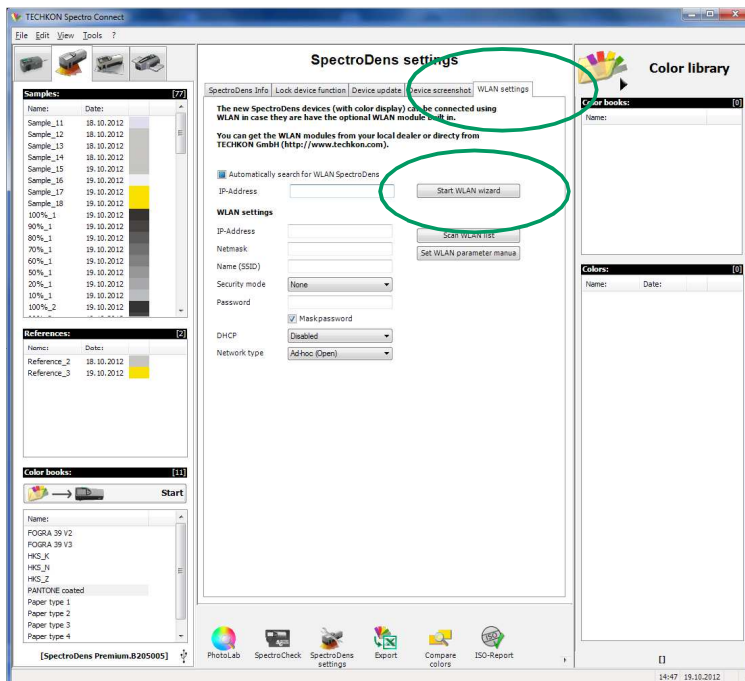


Setup of the WLAN connection

Start the software SpectroConnect, select **SpectroDens settings**, turn on the instrument and connect it with the USB cable to the PC.

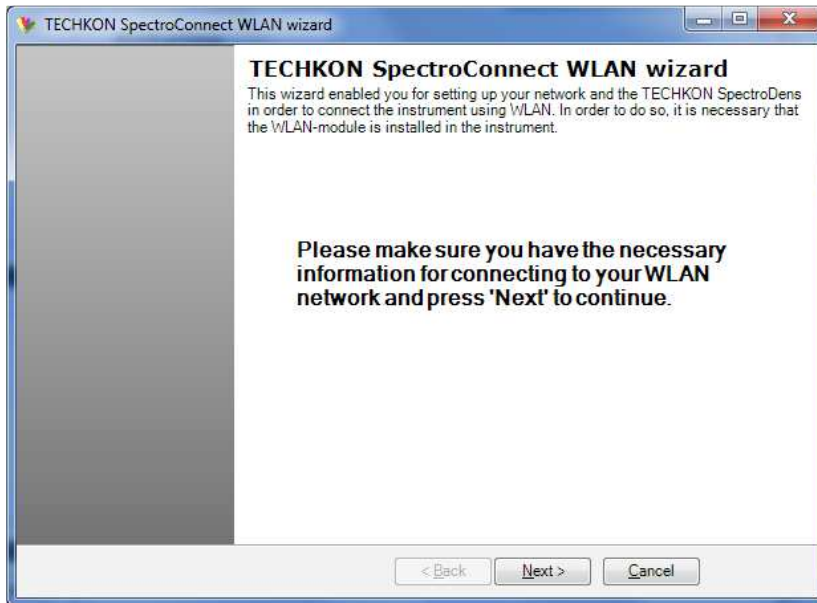


The symbol to the right of the serial number indicates the type of connection; in this example it is an USB connection.



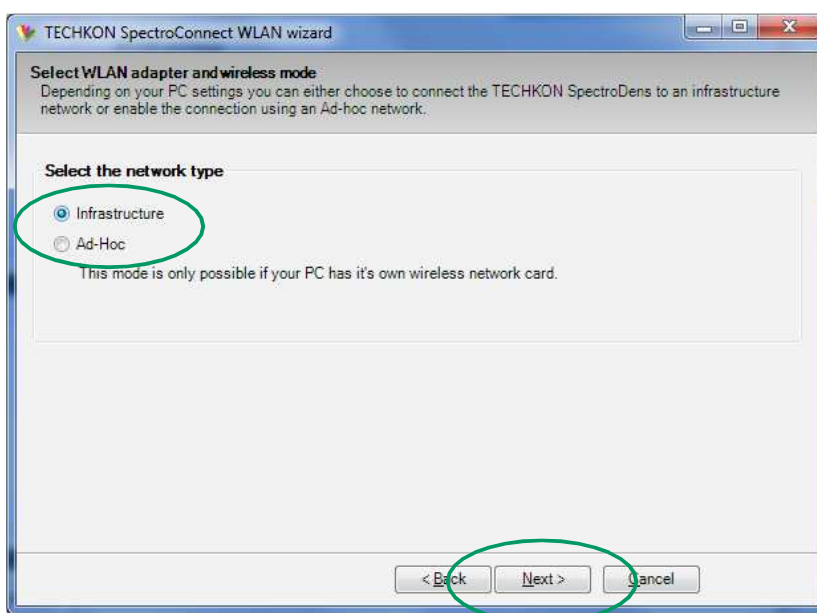
The WLAN settings folder is available after connecting the instrument via USB cable to the PC. To establish a WLAN connection, please **start the WLAN wizard**.

The WLAN wizard will guide you through the setup process. Make sure you have all information about your WLAN network available.



Two types of WLAN connections are possible: Infrastructure and Ad-Hoc. Infrastructure should be selected if a WLAN network is already installed in the working area. Ad-Hoc allows a direct connection to a PC using its WLAN module or any WLAN USB stick.

Infrastructure

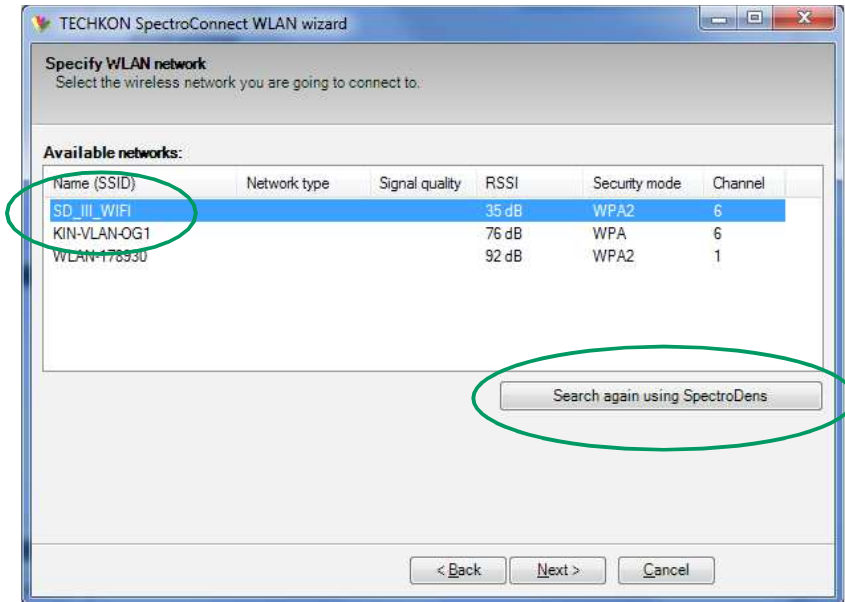


Select **Infrastructure** and click on the **Next** button.

The wizard will show all WLAN networks which are available.

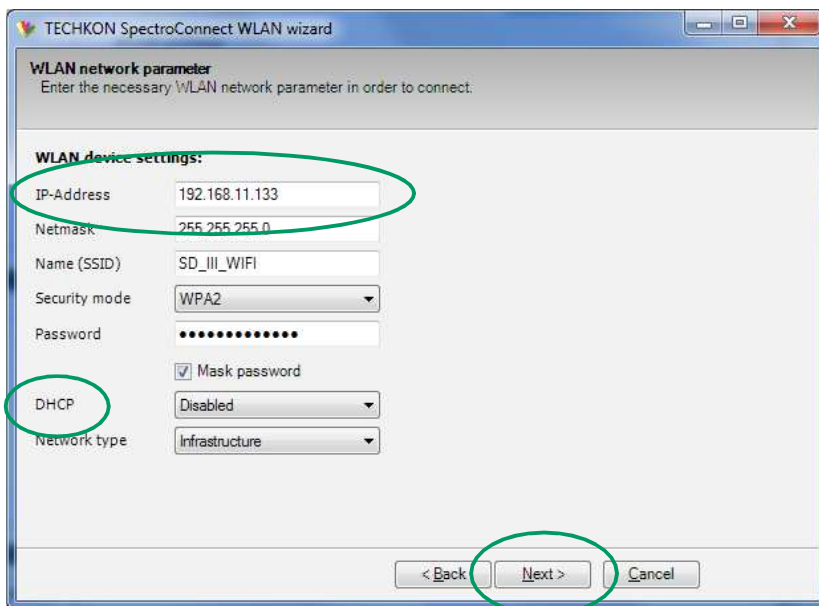
Select your network and click on the **Next** button.

Should your network not be listed you can try again by clicking on **Search again using SpectroDens**.



Please enter the IP-Address, the netmask and the password of your WLAN network in order to connect.

You can enable DHCP if your network is supporting this function. Then a free IP-Address will be used automatically.



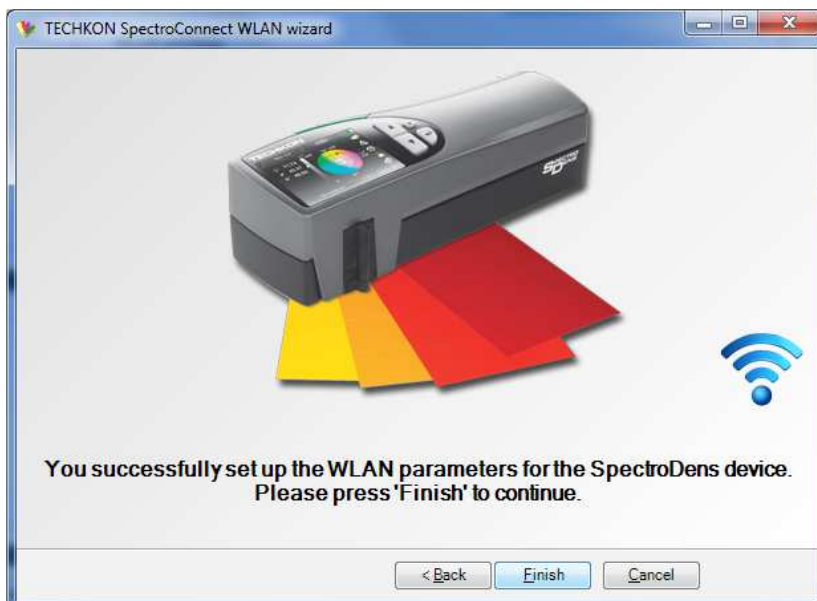
After entering the information, please click on the **Next** button.

SpectroDens is now looking for the WLAN network and if available will establish a connection.

The gray color of the symbol is indicating the search function. Once the WLAN network is found and the connection is established, the color of the symbol will change to blue.

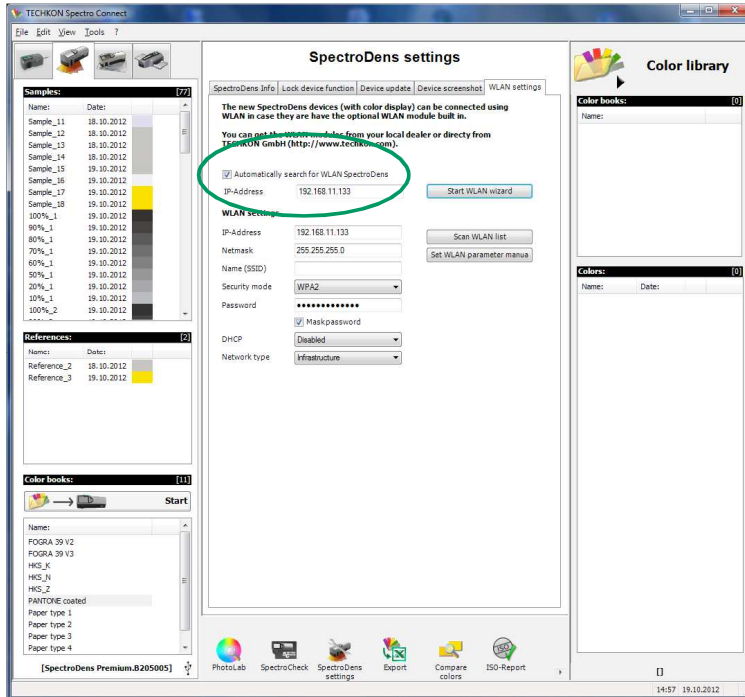


SpectroDens is now connected to the WLAN network and ready to be used wirelessly.



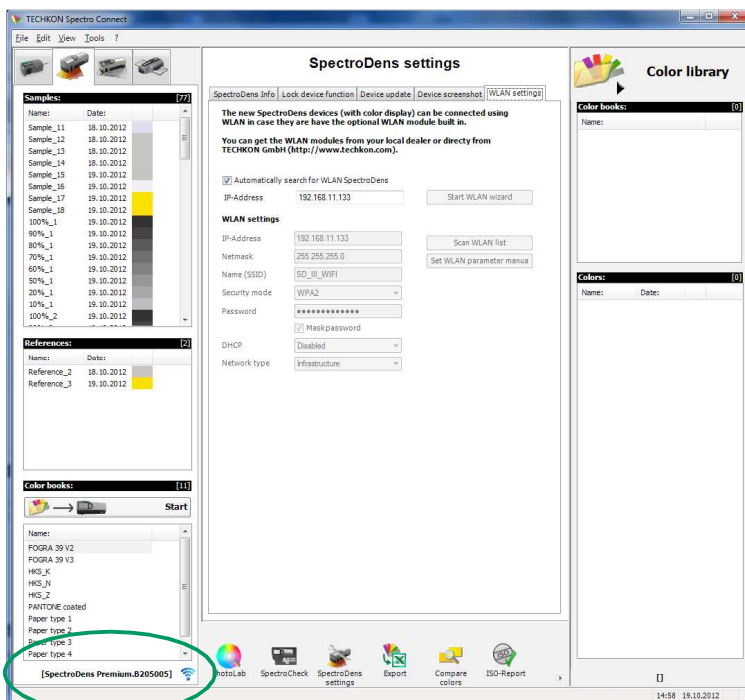
The settings will be applied and shown in the WLAN settings.

By activating the function **Automatically search for WLAN SpectroDens** the connection will be established automatically when used next time.



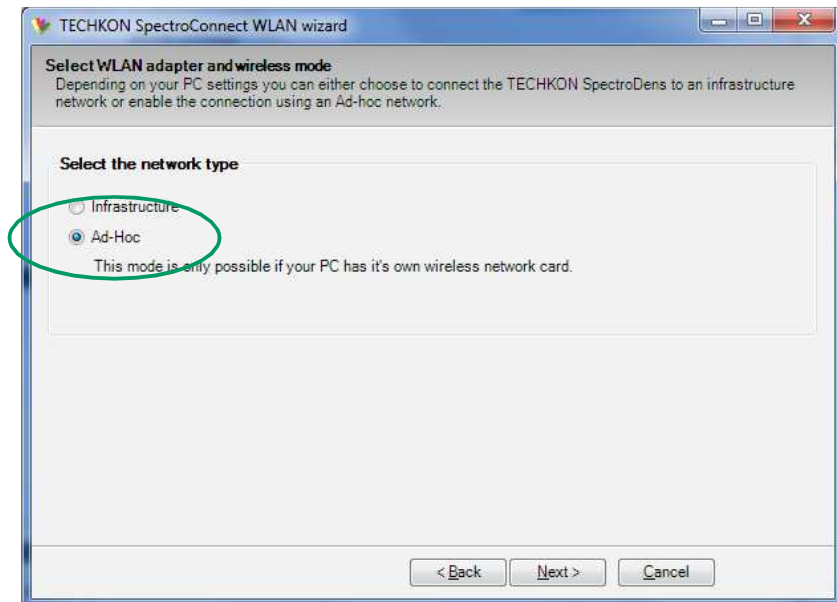
Now you can disconnect the USB cable.

The connection via WLAN will be indicated by the symbol next to the serial number. The blue color of the symbol indicates an active connection.



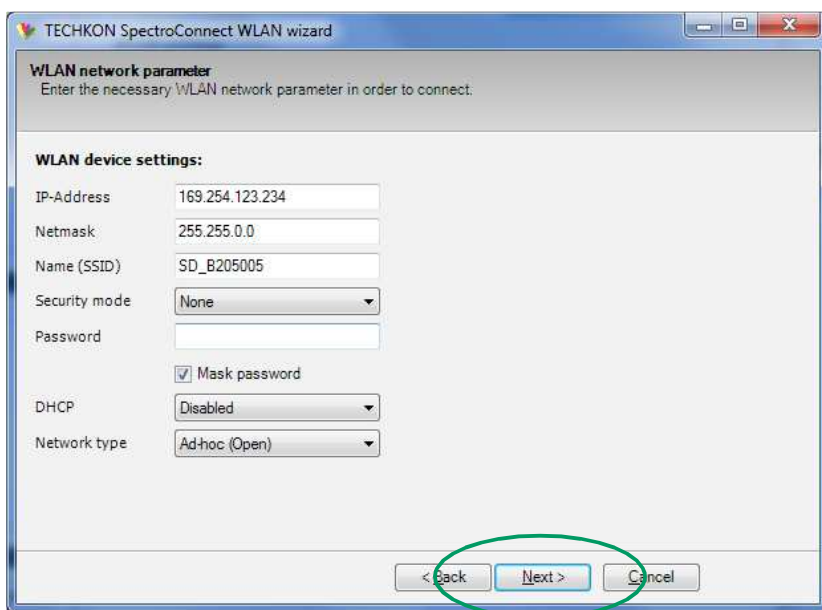
Ad-Hoc connection

To establish an **Ad-Hoc** network select this function during the wizard setup.



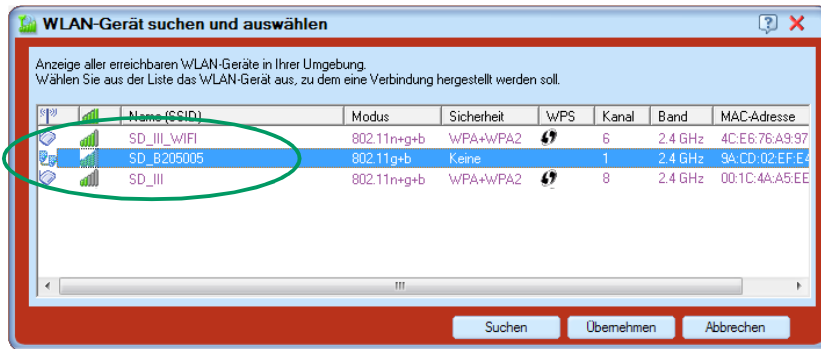
The IP-Address, the netmask and the name (SSID) of the network are predefined in this case and will be shown for your information.

Click on the **Next** button to continue.



Use the software of your WLAN network card or WLAN USB stick to setup the WLAN connection to your device

Select the WLAN network named after the serial number of your device.



Confirm the settings and check the connection.

Once the connection with your network card or WLAN USB stick is established you have to go back and click on **Repeat search** to connect SpectroConnect to the WLAN network.

A successful connection will be indicated by the blue WLAN symbol.

Continue in the same way as described for the infrastructure network (see p. 29).



Device information and safety instructions

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

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

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

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

Reset

A device reset sets the device back to factory settings. All calibration data (including SLOPE values), stored measurement values, reference-, target-, and tolerance-values will be deleted.

If the reset procedure in the settings window is not possible, a hardware reset has to be carried out. The battery plug has to be unplugged for a couple of seconds and then to be connected again.

Warranty

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

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

Inspection intervals

TECHKON SpectroDens is maintenance free. We recommend to **validate the complete functionality of the devices in a 24 months time interval** in the TECHKON service center.

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