Operating Manual

Spectro LFP qb

Spectro LFP qb Textile edition

automatic reflection and transmission spectrophotometer

Operating manual edition E4

barbieri

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Chapter 1: Introduction

May we congratulate you on your choice!
We from BARBIERI electronic are proud of presenting to you the spectrophotometer Spectro LFP qb. This instrument features most precise optics, state-of-the-art electronics and software. It is especially created for use in color management for the digital imaging market.
May we suggest you read the operating manual first for fully enjoying the capabilities of this instrument; thus you will be able to get familiar with its functions step by step. As always, BARBIERI electronic supports you with a one year warranty through its service organisation. Please get in touch with us in case of need. May we also thank you for the confidence you have put in us by purchasing this instrument.

Stefan Barbieri
CEO

Operating manual edition E3
for instruments with serial number B9030167 or newer (build march 2019 or newer)

1.1 What you can do with this instrument

Most precise color measurement
Spectro LFP qb enables you to exactly determine the colors of both transmission and reflection copy and is conform to ISO 13655-2017. Thanks to a highly sophisticated diffraction grating and state-of-the-art electronics using best components this revolutionary spectrophotometer warrants utmost precision in determining color values, as required today for numerous applications.

Most different materials
The following materials printed on large format inkjet-printers can be measured automatically: papers, vinyl, textiles, cardboards, plastic plates, gypsum plates, wood, glass, stone and ceramics plates.

For LFP, digital textile and packaging market
Individual ICC profiles for digital large format output equipment (printers) can be created based on measuring values of Spectro LFP qb. These profiles are used by color management applications (RIP, Adobe CC etc.) for exactly matching the colors of original and copy.

	Spectro LFP qb	Spectro LFP qb Textile edition
automatic reflective measurements	X	X
automatic transmissive measurement	X	X
2, 6 and 8 mm measuring aperture	X	X
M0, M1, M2, M3 measuring condition	X	X
Air blowing system in reflectionoptics	X	X
Electrostatic Textile sample holder w frame + sticky mat sample holder	optional	X
TEX activation for automatic Textile chart recognition	optional	X

1.2 Components of the Spectro LFP qb instrument

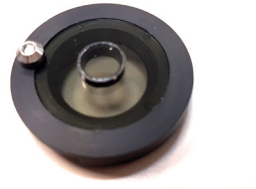
The Spectro LFP qb comes with the following components:

- Spectral unit
- Platform
- Sensing unit

Additional accessories included with the instrument:

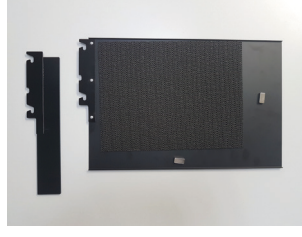
- Guide to be fixed at the right side of the instrument to help support samples
- Reflection sample holder (code: C5H40)
- Transmission sample holder (code: C5H50)
- Spot measurement guide (code: C5H70)
- USB connecting cable type USB-C
- Download link to USB driver and Gateway measuring software for Mac OS X and Windows
- Power supply adapter
- This operating manual
- Dust cover
- Packaging (keep it for possible transports)

1.3 Optional components



Polarization filter for reflection measurement (Code: C5F10-3)

To be used when measuring samples with shiny surface.

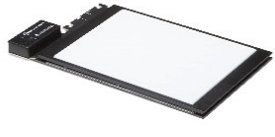


Set of 2 sample holders for special materials (code: C5H20) consisting of:

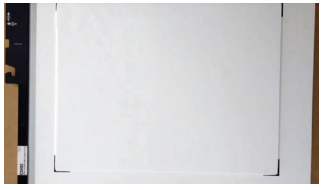
1. Reflection sample holder for extra heavy reflective materials (code: C5H21)
2. Transmission sample holder for thick transparent materials (code: C5H22)

Electrostatic sample holder for reflective thin materials (Code: C5H10)

Frame transmission sample holder for M1 measurements (C5H30)



Electrostatic Textile sample holder with frame for reflective measurements (Code: C5H80). Included with Textile edition of instrument



Sticky mat holder (Code: C5H82). Used to fix samples like very thin or elastic textiles. Included with Textile edition of instrument

Chapter 2: Putting into operation

2.1 Installing the hardware

When unpacking a new Spectro LFP qb device, the following procedure has to be done to put al components together:
- fit the supplied battery pack into its place on the back of the Spectro LFP qb spectral unit.
- mount the spectral unit onto the device by inserting it until it is fixed by the magnets
- mount the Sensing unit by inserting it into the extension connector on the left side of the platform
- mount the guide which helps support samples be inserting it into the appropriate wholes at the right side of the platform

Installing the connecting cables:
• The power supply for the spectrophotometer is connected to the rear side of the instrument
• When connecting the instrument by USB port, use the supplied USB-C cable and connect it to your computer
• When connecting to a TCP/IP network, use a Ethernet cable and connect the instrument to your LAN

USB connection

If you use the USB connection, please verify below if a USB driver installation is necessary.

Installing the USB driver on a Mac computer under OS X

Switch off the Spectro LFP qb.

Download and run the "Barbieri Gateway software installer" and follow the instructions.

The installer will detect your operating system version and if necessary install the required USB driver.

- for Max OS 10.11 and newer: no driver installation is necessary. It comes already with the necessary AppleFTDI driver
- for Mac OS 10.10 and earlier: the necessary FTDI driver is installed

Check if driver is correctly installed

- Switch on instrument
- Open “System Information” (About this Mac/ More info...)
- Show the “System Report” and check “Hardware/ USB”. The instrument “Spectro LFP qb” must be listed

Installing the USB driver on a PC with Microsoft Windows 10 or newer

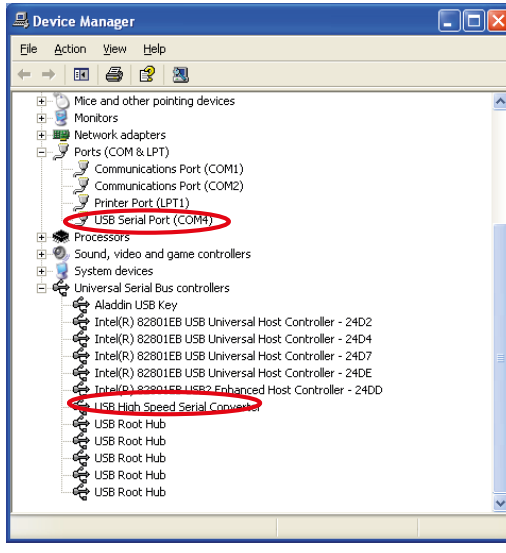
There are two drivers to be installed for the connection between your computer and Spectro LFP qb:

A. High speed USB to serial converter
B. USB virtual serial port driver

Switch off the Spectro LFP qb.
Download and run the "Barbieri Gateway software installer" and follow the instructions.
The installation procedures are guided automatically by an installation wizard.

Check if driver is correctly installed

- Switch on instrument
- Open “Control Panel”, “System”
- Select “Hardware” and click “Device Manager”.
- Look into “Ports” and “Universal Serial Bus controllers”.



Ethernet connection

When the instrument is switched on, the instrument will try to retrieve the IP address from a DHCP server.

The retrieved IP adress and the MAC address of the platform can be displayed on the display of the instrument by selecting the "Info" icon on the status bar.

2.2 Switching ON and OFF the instrument

The instrument is switched ON in the following sequence:

• Switch on your computer

• Switch on Spectro LFP qb (The switch is situated on the back side of the platform)

The display on the spectral unit will illuminate and indicate the booting process.

The power LED on the back side of Spectro LFP qb platform near the switch will light up.

The instrument performs the following movements:

- the spectral unit moves in its up position
- the xy-table moves to the right side near the measuring head and moves then to the left side.
- The power LED on the back side of the Spectro LFP qb platform will light intermittend.

The instrument is now ready for operation and you can now start the measuring software on your computer.

To switch OFF the instrument, use the switch on the back side of the platform. The instrument will then go into shut down mode and switch off after a few seconds.

2.3 Battery charging

The Spectro LFP qb spectral unit is equipped with a rechargeable battery which allows it to be detached from the platform for spot measurements.

The charging status is indicated in the status bar of the display:

 Battery status

This battery is charged automatically when connected to the platform. To fully charge an empty battery, 2,5 hours are needed.

Note: the spectral unit will charge also when detached from the platform and connected by USB cable to a computer. A LED near the USB connector is indicating if the instrument receives power for charging. In this case the charging time for an empty battery is approx. 10 hours.

2.4 Product registration

It is recommended to register your instrument with Barbieri electronic in order to get access to privileged information like access to download area, product information/ firmware updates etc.

Registration can be done through the Barbieri Gateway measuring software.

2.5 Extended functionality activation

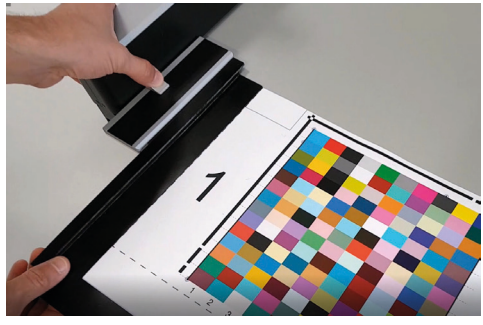
Activation of optionally available specific functionalities is available for this instrument such as:

DOC: Digital Output Control
TEX: Image capture and chart recognition for textile chart applications

The home screen will display if these functionalities are activated.

Chapter 3: Choosing the correct sample holder

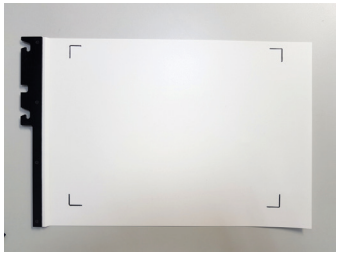
Sample holders can be exchanged quickly by releasing them with the switch on the transport arm and moving the sample holder to be exchanged towards the operator:



When inserting a new holder, make sure it is inserted until a click noise indicates the final and correct fixing of the sample holder.

3.1 Measuring reflective samples

Reflective materials must be measured using the supplied white backing reflection sample holder C5H40.



This sample holder is made of a selected white material conforming to ISO 13655-2017.
Measurements made with this sample holder are also named "white backing measurements" as recommended by the ICC (International Color Consortium) for the creation of ICC profiles and as stated in ISO 13655.

If "black backing measurements" are requested, please fix a dark sheet (density > 1.5) on this sample holder.

This sample holder can be used for samples up to 150 g of weight. For heavier samples, please use the optional sample holder for heavy materials. See Chapter 3.3.1.

The sample to be measured must be fixed inside the indicated corner marks using a tape.

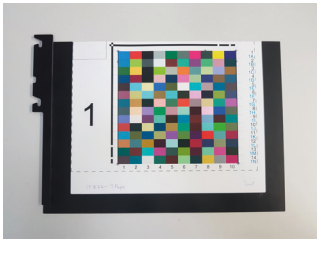
3.2 Measuring transmissive samples

Transmissive materials must be measured using one of the following sample holders:

1) The supplied standard transmission sample holder (C5H50).

For measuring insert the sample between the two transparent sheets of the sample holder and position inside the corner marks.

2) The optional Frame transmission sample holder for M1 measurements (C5H30)



This sample holder allows frame mounting og the color charts and assures no UV-cut filtering occurs when measuring.

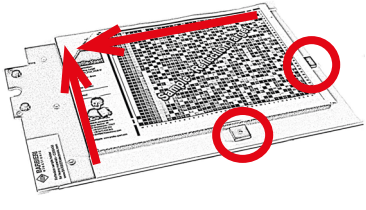
3.3 Measuring special materials

For measuring special reflective or transmissive materials there is a set of 2 special sample holders available (C5H20):

3.3.1 Measuring heavy reflective materials

When measuring heavy reflective materials, the optional sample holder for heavy materials must be used (C5H21).

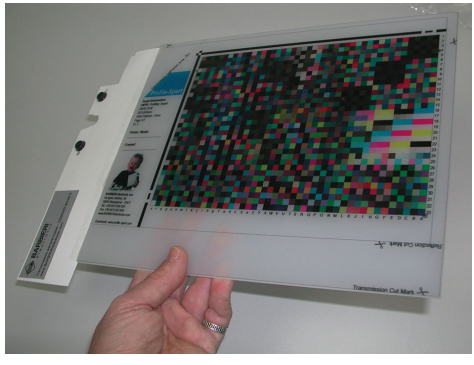
It consists of a metallic holder with 2 magnets which are used to fix the sample. The anti-slip mat helps keep target from moving during measuring.
This sample holder can be used for samples up to 3 kg of weight.
Fix the side guide and the sample holder on your instrument.



The target sample must be fixed with the two magnets and pushed towards the upper left corner of the sample holder.

3.3.2 Measuring thick transparent materials

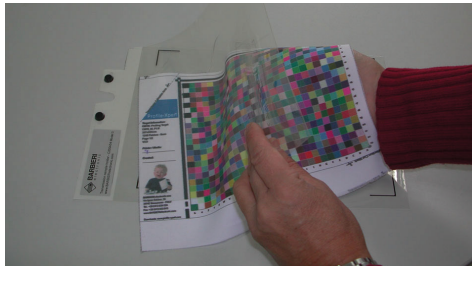
When measuring thick transparent materials like glass or plastic plates use the sample holder C5H22. The recommended media thickness is up to 5mm. The thicker the material is, the larger must the patches be. For material of 5mm thickness the recommended patch size is 10mm.



The sample is fixed to the sample holder using a tape.

3.3.3 Measuring special transparent materials

When you measure transparent materials like textiles which you like to measure in transmissive mode use the sample holder C5H50.



For measuring insert the sample between the two transparent sheets of the sample holder and position inside the corner marks.

3.3.4 Measuring Textiles/ Fabrics

A special electrostatic sample holder with frame (order code C5H80) is optionally available for fixing textile materials.

If the material to be fixed is very thin, or elastic, then the chart might only be fixed distorted. In this case use the automatic target recognition option available with the "Textile edition" of the instrument in order for the software to detect correctly the center of the patches,

For very difficult to fix textiles, use the sticky mat sample holder (order code C5H82).

Do never use this sample holder without chart inserted, as the measuring head will stick on the holder when touching its surface and this could cause damages to the device

Note: the surface of this sample holder can be cleaned after use by washing it under water. Please let it fully dry before next use.

Chapter 4: Using the instrument

4.1 Status Bar

The upper status bar in the display indicates the following information:

M0, M1, M2 Measuring condition (Light condition)

WiFi connection and signal strength

 Battery status

 Information button

 Exit window (go back). Used when entering menus.

The instrument is equipped with a touch panel which can be operated by your fingers, or by a pointer.
Please make sure to not scratch the panel by avoiding using hard items.
The panel can be cleaned with the soft cloth included with the instrument.

Note: the color indicated on the screen are only approximate colors and no color management is applied for this screen!

4.2 Showing instrument information

On the main screen, click on  in the upper right of the statusbar to show the instrument information:
The following information is displayed:

- Firmware version
- Serial number (Instrument/ Modul)
- MAC address (platform and WiFi)
- Clock
- Temperature
- relative Humidity

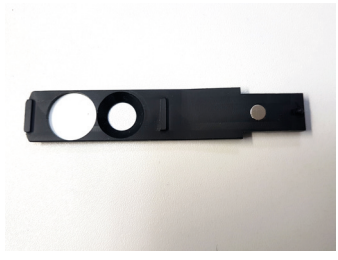
Note: the clock is set automatically to the computer time and date when connecting the instrument to a computer and launching a measuring software.

4.3 Calibration

The instrument is capable of self-calibration.

Reflection

Reflection calibration is done by means of its internal white calibration standard placed under the measuring head.

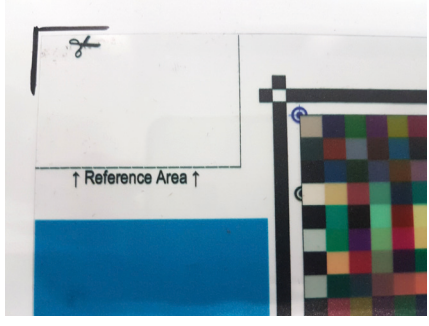


Note: The validity of this reference white is 24 months from the production date. See the serial no. on the reference white. The first four characters indicate the year and the month of production. For example a calibration strip with a serial number B701021indicates: Year:B7= 2017, Month: 01= January. This reference white is valid until January, 2019.

The instrument automatically calibrates itself before starting measurements.

Transmission

Transmission calibration is done automatically on the position of the upper left corner of the target area.



In transmission mode, you have the option to choose between two calibration modes:

- relative (default) or
- absolute

Relative white calibration

Nearly all linearization and profiling targets require to calibrate against the white of the material to be measured, assuming this as the reference white with a value of L*=100 a*=0 b*=0.

This is in particular necessary for the creation of ICC profiles for non completely transparent materials (diffuse opaque materials etc.). In this case, the calibration area is covered by the white part of the material and the instrument automatically calibrates to that white.

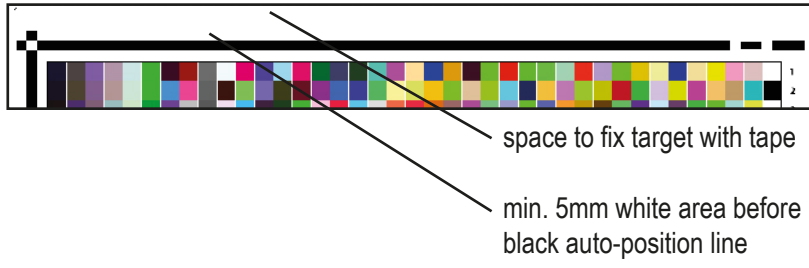
Absolute white calibration

The absolute white calibration method is used to determine the correct L* a* b* values of the target including its white point. As the L* value can be as low as 50 or lower for diffuse/opaque materials, this method is not recommended for linearization and color management applications as it will not result in accurate calculation of ICC profiles.

Cut off the reference area of the target to allow the instrument to calibrate to absolute white.

4.4 The auto-position feature

The instrument is capable of automatically finding the position of the sample to be measured.
When you insert a target for measurement, the instrument needs to know where the patches are located. This is automatically determioned by scanning some special border lines (auto-position lines):



If the sensing unit is connected to the platform, the autopositioning is done by taking a picture with the camera and calculating the corner points by the sensing unit.
If the sensing unit is not connected, or the picture processing fails, the spectral unit is used to scan the lines and determine the corner points.

Please verify when inserting the target into the sample holder (specially in transmission), that the space before the auto-position line is visible and not covered by the sample holder or tape.

4.5 Measuring modes

The Spectro LFP qb supports three measuring modes:

1. Up-Down mode

In up-down mode the measuring head of the instrument moves up and down between each measurement. Use this mode for sensitive materials to avoid any scratches on the surface of the target.

This mode gives also the most accurate measurements and is used for measuring fluorescent inks.

2. Fast (default) mode

Fast measuring mode is the default mode of the Spectro LFP qb. In this mode the measuring head lies on the target and the surface is scanned.

3. Contactless mode

The contactless mode is similar to the above fast mode with a difference that the measuring head does not touch the surface of the target. This measuring mode is suitable for sticky and sensitive materials.

4.6 Changing the measuring aperture

The Spectro LFP qb spectral unit is equipped with a selectable measuring aperture. The switching occurs automatically by the software driving the instrument (manual switching is supported only in spot mode when spectral unit is used detached from the platform).
The aperture size is valid for reflective and transmissive measurements.
The selected aperture is indicated on the display.

The small aperture corresponds to 2mm aperture, the wide aperture to 8mm.

The wide aperture should be used with structured materials or if the print resolution is smaller than 120 dpi.
When using the wide aperture, make sure that your target to be measured has patches equal or larger than 10mm.

The recommended patch size is as follows:
2 mm aperture: 5 mm or larger
6 mm aperture: 10 mm or larger
8 mm aperture: 12 mm or larger

4.7 Media thickness

The measuring head is automatically positioned in its highest position when switching instrument on.
In this position, you can load samples with thickness up to 20mm when using the standard reflection/ transmission sample holders.
When starting measurement, the instrument moves to a upper left position on the sample and lowers the measuring head until it touches the surface of the sample.

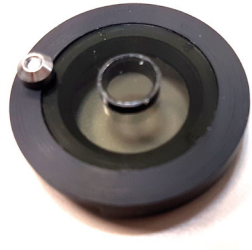
As the thickness of the sample to be measured is determined in only 1 position, it is important that the material has the same thickness on the whole measuring area. Tolerances of up to +/- 1 mm are acceptable.

The instrument supports measurement of samples up to 20mm thickness.
While this is an outstanding feature for reflective materials, it has to be used with caution for transmissive materials. If colors are printed only on the surface of the transparent material, straylight can influence measurements and measuring values will be wrong. Transparency measurements are for this reason in most cases limited to a thickness of up to 3mm.

4.8 UV cut filter and Polarization filter

The UV cut filter is already included into the instrument and is activated by selecting the M2 measurement condition.

The optionally available polarization filter for reflection measurments can be exchanged by simply removing with your finger first the reference white on the spectral unit and then the aperture ring and replacing it with the polarization filter cover. The aperture ring is holding by a magnet:



The M2 measurement condition (UV cut filter) is used to eliminate the effect of optical brighteners. Measurements correspond to measurement condition M2 of ISO 13655:2017

The Polarization filter is used when measuring shiny surfaces. Measurements correspond to measurement condition M3 of ISO 13655:2017

When the polarization filter is mounted, measuring speed is slower.
Note: In case the chart autopositioning by the sensing unit should fail, manual positioning must be used!

4.9 Measuring daylight fluorescent inks

Fluorescent inks, as understood here and as used in the printing industry, are inks which absorbe light in UV and visible wavelengths and reradiates at longer wavelengths in the visible spectrum and is manifested as color.
This effect occurs already under daylight condition.

The Spectro LFP qb is capable of illuminating in daylight condition by using the M1 measuring condition and is therefore capable of stimulating this fluorescent effect.

The reradiated light is added to the normal reflected light resulting in spectral curves which exceed the 100% remission.
The Spectro LFP qb is capable to automatically expand its dynamic range when using the UpDown mode and is therefore capable of measuring fluorescent inks which exceed by more than 200% the remitted light.

Therefore, to correctly measure fluorescent inks:
- use the M1 measurement condition
- use the UpDown measuring mode
- save spectral data into measuring files

4.10 Spectro LFP qb with Barbieri Gateway software

The function of this software is to allow you to drive a BARBIERI measuring device if your particular software (RIP etc.) does not support the device directly.This software will measure any type of targets and save a measuring file in text or XML format. The software runs under either Windows or Mac OSX and delivers measurement data either spectral, CIELab or density.

Please make sure to use Gateway version 4.5 or newer for full support of all features of this instrument.
The software is available for download at the following web-site:

http://www.barbierielectronic.com

4.11 Spectro LFP qb with other software

When using software from a different manufacturer than Barbieri, please see the operating manual of your software on how to use the Spectro LFP qb with your software or use the above applications with file import.

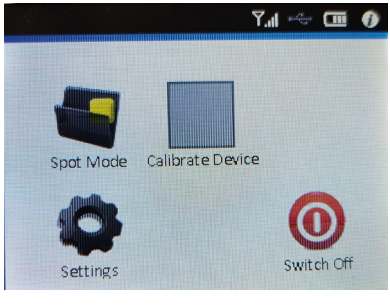
Please note that the Spectro LFP qb is compatible with the Barbieri Spectro LFP S3 instrument and therefore can be used in compatibility mode with any software supporting the Spectro LFP S3 device.
The default measurement condition/ illumination type to be used to be compatible with Spectro LFP S3 measurements is M0, M2 or M3 respectively. This can be selected manually by selecting the measuring condition in the status bar. A menu pops up allowing selection of condition to be used.
Additionally the selection of M1 condition is allowed.

Chapter 5: Spectral unit standalone operation

5.1 Spot measurement

The spectral unit can be detached from the platform to use it as a manual device for spot measurements.
Switch off platform and detach the spectral unit by releasing the button on the back side of the spectral unit.

Switch on spectral unit by pressing the button on back side.
The display will show the following content:



The "Calibrate device" button performs an automatic calibration of the device by automatically inserting the internal reference white and performing calibration.

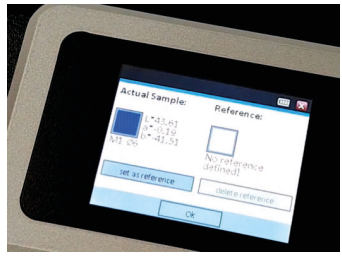
Under "Settings", the WiFi connection can be enabled/ disabled.
The top status bar will indicate if instrument is connected by USB or by WiFi interface.

Spot measurements are made and displayed by selecting "Spot Mode". The measuring aperture and measuring condition (M0, M1 or M2) to be used can be selected by selecting the corresponding indication in the top status bar.

Place instrument on the spot color to be measured using the spot positioning guide and press the measure button:

The L*a*b* values are indicated on the display.
If a computer is connected, spectral informationis automatically transferred to the computer.

When pressing on Delta E button, the measured color can be saved as a reference color and the deviation indicated as Delta E value can be indicated foa all future spot measurements.



5.2 USB / WiFi connection

The instrument can be connected to a computer using a USB connection or by using a WiFi connection.

Setting up the WiFi interface

WiFi connection needs to be set-up by selecting the "Settings" button end selecting "WiFi" button.

Click on "Enable WLan" to enable the WLan interface.
Two connection types are supported:
- device to WLan (Router mode)
- PC to device (Access point mode)

When selecting "device to WLan", a list of available Wlans is indicated and the desired WLan can be selected. In case of password protection, the password is requested.
After successful connection, the IP address and MAC address are indicated.

Please note: the instrument uses TCP/IP port 9760 to communicate over the network with your software. Make sure this port is not blocked by a firewall in your network.

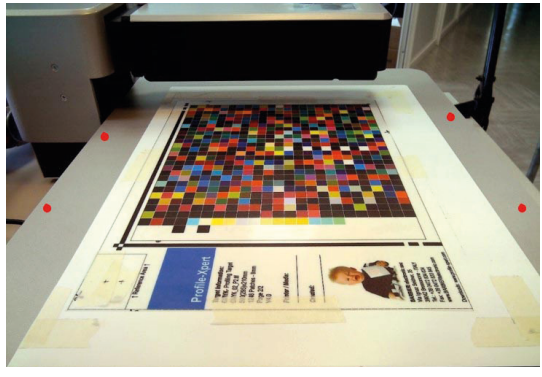
Chapter 6: Sensing unit

The sensing unit consists of a camera with white LED illumination and a processing board with intelligent computer vision processing capability.

A green LED on the connector of the sensing unit indicates that it is correctly connected and operational.
The unit is switched on when switching on the platform. The white LED will illuminate during boot-up and is switched off when ready.

The sensing unit is activated automatically during the autopositioning process when measuring charts with autopositioning lines. During this process, the white LED will illuminate several times the chart and pictures are taken.

When the "TEX" option (Textile activation) is activated on the instrument and using the Barbieri Gateway software or any software supporting this option, the sensing unit will capture a picture of the inserted chart, measure and analize it and deliver information about chart size, chart type, chart position etc.



There are 4 black marker points on the surface of the instrument indicated in red in above image.
These markers are used by the sensing unit as fix points to correctly calculate metrics.
For a correct functionality of the metric algorithms it is important to make sure these points are visible to the camera and not covered by the chart inserted.

Chapter 7: Instrument Maintenance

Thanks to its closed construction this instrument requires very little maintenance.

The external surfaces of all optical parts should be cleaned every now and then. Please bear in mind that the high-quality reflection optics in particular are very sensitive to scratches and, therefore, should only be cleaned with very fine brushes or compressed air!

7.1 Changing white calibration standard

Replace the reference white of the Spectro LFP qb spectral unit if it is no more valid or it is somehow damaged. Any scratches, dust or dirt on the surface of the reference white may affect the accuracy of the instrument.

The validity of the reference white

The validity of the reference white is 24 months from the production date. See the serial number on the reference white, or if not present, the serial number of your instrument. The first four characters indicate the year and the month of production. For example a calibration strip with a serial number B703198 indicates: Year: B7= 2017, Month: 03= March.This reference white is valid until March, 2019.

7.2 Changing a measuring lamp

The Spectro LFP qb is equipped with LED modules as illuminations placed in the spectral unit for reflection measurements and additional LED modules placed in the platform under a diffusor for transmission measurements.
These LED modules cannot be replaced by the user. They are verified and recalibrated during the recertification process at the service centers.

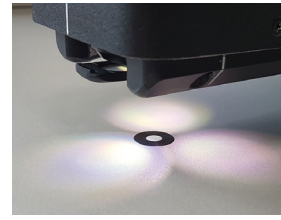
To verify if the LEDs are working correctly, run the "Get Service Report" feature within your favorite software or the Barbieri Gateway software and send it to the support centers.

7.3 Cleaning the optics

It is recommended to inspect and clean the reflection optics from time to time.
The reflection optics are accessible by removing the spectral unit from the platform and removing the reference white and aperture ring.
Use dry compressed air to clean and blow out particles which are lightly attached to the optical components.

Note:
The Textile edition is equipped with a air blowing system which is activated when the reference white covering the optics aperture is moved to open position for measurements. It makes sure a small air circulation is blowing out the aperture during measurements avoiding fibers and dust to enter the optical parts.

Also clean the transmission optics by cleaning the white ceramics diffusor with a soft lens tissue and/or a non colored solvent.



7.4 Packing the Spectro LFP qb for transport

The Spectro LFP qb is a highly sophisticated and sensitive instrument. Thus a special care is needed when the instrument is transported. Your instrument was shipped in a specially designed carton to assure against damage. Ship your Spectro LFP qb always in its original package.

It is very important to pack the Spectro LFP qb carefully to avoid any damage during the transport, by packing the components platform/ spectral unit/ sensing unit separately.

Note: The spectral unit is equipped with a Lithium Ion battery.
For security reasons, this rechargeable lithium Ion battery must be removed before packing the instrument for shipment.
This makes sure, no fire accident can happen and the WiFi radio signals are turned off.
Remove the battery holder by unlocking the lock accessible from the back side of spectral unit. A slotted screwdriver can be used to release the battery.
Then place battery holder in its space in original packing.

7.5 Warning and Error messages

The display of the Spectro LFP qb spectral unit can show the following warnings/ errors:

W01: Wrong spectral unit detected. Please attach spectral unit with serial number Cxxxxxx and restart the instrument.

The Spectro LFP qb Platform has stored parameters about the spectral unit. If a new/different spectral unit is connected, a warning appears. Either connect the correct spectral unit or contact support for receiving a new parameter file for the platform.

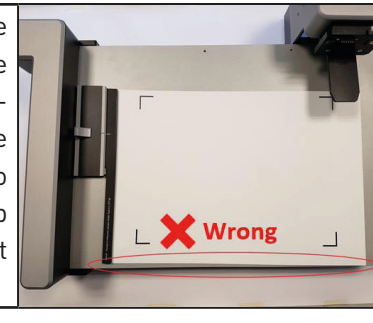
W02: Battery not inserted or bad battery! Insert battery or contact support if battery is defective.

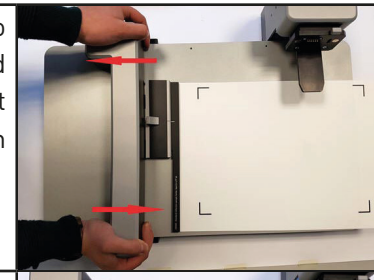
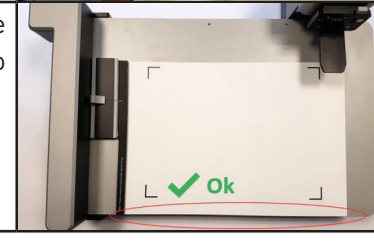
The Spectro LFP qb can only be operated if the battery pack is correctly inserted into the spectral unit. Please remove the spectral unit from the Platform and verify if the battery pack has been inserted

W03: Transport arm is not aligned. Please see instruction manual.

When transport arm is moving to its left position, two switches indicate if the arm is correctly alligned. If it is misaligned (for example after transport), this warning will show up.

Attach a sample holder to the Spectro LFP qb and move the Transport arm in its initial position. The edge of the sample holder needs to be parallel to the edge of Specrto LFP qb platform. A distorted transport arm looks like the following:



Move the transport arm into the middle of the platform and push both ends of the transport arm in the direction shown in this picture:	
Now the edge of the sample holder should be parallel to the edge of the platform:	

7.6 Updating the instrument firmware

The instrument firmware is recommended to be kept updated. The actual firmware version is displayed on instrument screen if "Info" is selcted in the status bar.
Connect the instrument to the Barbieri Gateway software, register the instrument, and get access to firmware updates.
Please see the Barbieri Gateway software instruction manual for details on how to proceed with firmware update.

Note: the firmware package for Spectro LFP qb consists of various parts:
- Platform
- Spectral unit
- Sensing unit
- Transmission unit

Specifications

Spectral unit	
Measurement conditions:	According to ISO 13655-2017 Reflection and transmission: M1 (method a), M0, M2 (UVcut), M3 (reflection only, with optional polarization filter)
Measuring apertures:	Switchable between 2, 6 and 8 mm diameter (reflection and transmission)
Geometry:	reflection 45°:0° circumferential (ISO 5-4:2009) transmission d:0 (ISO 5-2:2009)
Calibration:	automatic with internal white reference
Physical illumination:	programmable color temperature Reflection: 3 point circumferential, 7 LED-chip Transmission: diffuse, 6 LED module
Measuring sensor:	diffraction grating with diode array • Spectral range: 380 ... 750 nm • Spectral resolution: 2 nm • Optical resolution: 10 nm
Spectral reflectance range:	dynamic (> 200%) for measurement of fluorescent specimens
Short term repeatibility:	0.05 ΔE00 on white ceramic tile (standard deviation, 10 measurements made in spot mode) < 0,2 ΔE00 in scanning mode
Inter-instrument agreement:	on 12 BCRA color tiles: Average: 0.5 ΔE00, Max: 1.0 ΔE00
Display:	320x240 pixel, touch screen
Battery:	Li-Ion accumulator 3,7V DC, 5300 mAh Charging time: 2,5 hours when connected to platform, 10 hours through USB port
Temperature sensor:	- range -20 ... +50 °C (-4 ... +122 °F) - resolution 0,1 accuracy: +/- 1,0
Humidity sensor:	- range 0 ... 100 % - resolution 1 accuracy: +/- 5%
Air blowing system:	The Textile edition reflection optics are equipped with air blowing system to keep free of dust and textile fibers

Interface:	USB 2.0 type C, WiFi 2,4 GHz IEEE 802.11b/g/n (2,4 GHz only) - Open, WEP, WPA, WPA2 Security - FCC (USA), IC (Canada), CE (Europe), MIC (Japan), KCC (South Korea) Certified
Dimensions:	237 x 82 x 65 mm
Weight:	1000 g

Platform	
Maximum measuring area:	305 x 230 mm (LxH)
Measuring speed (reflection):	Typical LFP chart with approx. 600 patches: 2 min
Target thickness:	max. 20 mm
Processing unit:	1 GHz Linux board
Interface:	USB 2.0 type C and B, Ethernet RJ45, IP4, DHCP, port 9760 (Ping activated)
Power adapter:	110...240 Volt
Dimensions:	775 x 550 x 175 mm (table extension included)
Weight:	12,2 kg

Sensing unit	
Camera:	8 MPixel
Processing unit:	1 GHz Linux board
Dimensions:	260 x 83 x 53 mm
Weight:	240 g

Spectro LFP qb	
Measuring software:	Barbieri Gateway for Microsoft Windows 7 or newer (32 and 64 Bit), Mac OSX 10.10 or newer
Total weight:	14,5 kg (including accessories)

Specifications are subject to change without notice

EG-Konformitätserklärung

Für das folgend bezeichnete Erzeugnis

Spectrophotometer Spectro LFP qb

wird hiermit bestätigt, daß es den wesentlichen Schutzanforderungen entspricht, die in der Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten über die elektromagnetische Verträglichkeit (89/336/EWG) festgelegt sind.

Diese Erklärung wird verantwortlich für den Hersteller:

BARBIERI electronic OHG
I. Seidner Str. 35
I-39042 Brixen (BZ)
Italien

abgegeben durch den gesetzlichen Vertreter: Barbieri Markus.

Federal Communication Commission Notice

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.

CAUTION: Operational hazard exists if AC adaptor other than original is used.

NOTE: Shielded interface cables must be used in order to maintain compliance with the desired FCC and European emission requirements.

For Italy:
INFORMAZIONE AGLI UTENTI

Ai sensi dell'art. 13 del Decreto Legislativo 25 luglio 2005, n.151 "Attuazione delle Direttive 2002/95/CE, 2002/96/CE e 2003/108/CE, relative alla riduzione dell'uso di sostanze pericolose nelle apparecchiature elettriche ed elettroniche, nonché allo smaltimento dei rifiuti".

Il simbolo del cassonetto barrato riportato sull'apparecchiatura o sulla sua confezione indica che il prodotto alla fine della propria vita utile deve essere raccolto separatamente dagli altri rifiuti.

La raccolta differenziata delle presente apparecchiatura giunta a fine vita e' organizzata e gestita dal produttore. L'utente che vorrà disfarsi della presente apparecchiatura dovrà quindi contattare il produttore e seguire il sistema che questo ha adottato per consentire la raccolta separate dell'apparecchiatura giunta a fine vita.

L'adeguata raccolta differenziata per l'avvio successivo dell'apparecchiatura dimessa al riciclaggio, al trattamento e allo smaltimento ambientalmente compatibile contribuisce ad evitare possibili effetti negativi sull'ambiente e sulla salute e favorisce il reimpiego e/o riciclo dei materiali di cui è composta l'apparecchiatura. Lo smaltimento abusivo del prodotto da parte del detentore comporta l'applicazione delle sanzioni amministrative previste dalla normative vigente.

Operating Manual C5M00

BARBIERI electronic SNC
Via Ignaz Seidner, 35
39042 BRESSANONE - ITALY
Tel.: +39 0472 834 024

E-mail: info@BARBIERIelectronic.com
www.BARBIERIelectronic.com

Member of