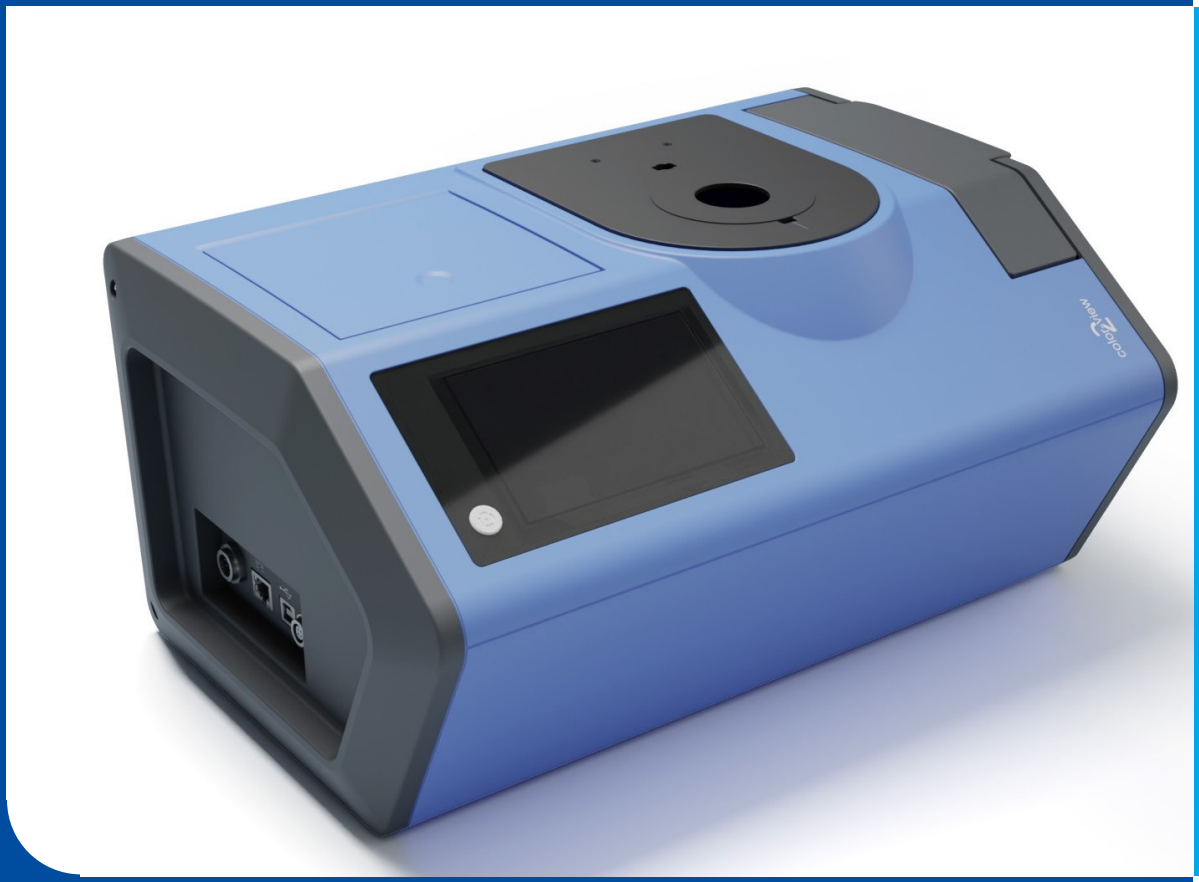
BYK



color2view

Benchtop Spectrophotometer

Operating Manual

A member of ALTANA

Table of Contents

1

Introduction

Dear customer,

thank you for having decided for a BYK-Gardner product. BYK-Gardner is committed to providing you with quality products and services. We offer complete system solutions to solve your problems in areas of color, appearance and physical properties. As the basis of our worldwide business, we strongly believe in total customer satisfaction.

Therefore, in addition to our products, we offer many VALUE-ADDED services:

- Technical Sales Force
- Technical and Application Support
- Application and Technical Seminars
- Repair and Certification Service

BYK-Gardner is part of Altana AG and a direct subsidiary of BYK, a leading supplier of additives for coatings and plastics. Together, we offer complete and unique solutions for you, our customer.

Thank your for your trust and confidence. If there is anything we can do better to serve your needs, do not hesitate to let us know.

Your BYK-Gardner Team

- https://www.byk-instruments.com

1.1 For Your Safety

CAUTION: Familiarization with safety instructions necessary

Absence of knowledge of safety instructions threatens your health and can damage the instrument. Read the safety instructions before you use the instrument the first time.

The safety instructions are part of the delivery content. You find the safety instructions in the dedicated booklet enclosed to the instrument carrying case.

The safety instructions also include information about disposal, liability and copyright.

CAUTION: Ergonomic hazard due to discomfort and fatigue possible

Discomfort and fatigue during usage of the instrument could lead to ergonomic hazards. For example a drop-down of the instrument is conceivable.

Always use the instrument with the safety wrist strap and take regularly breaks during your work with instrument.

WARNING: Eye damage can be caused by illumination LEDs

Looking into the illumination LEDs during measurement could harm your eyes. Do not look into the measurement aperture when the instrument is turned on - even if you assume a fault with the instrument.

1.2 Disposal

Disused electrical equipment such as this instrument must be professionally disposed. Do not dispose it in household garbage and make sure to observe the national law in your country.

1.3 Disclaimer

Exclusion of Liability

No liability other than as provided by law is assumed for direct or indirect damage sustained in association with the use of the instrument, the software or documentation.

BYK-Gardner precludes all liability claims if the usage described in "Intended Use" is disregarded. Any other usage than described in "Intended Use" is not according to the purpose of the instrument and leads to termination of liability claims.

See also

- Intended Use 12

1.4 Declarations

1.4.1 EU Declaration of Conformity

We,

BYK-Gardner GmbH

Lausitzer Strasse 8

D-82538 Geretsried

declare, that the instrument **color2view** complies with the requirements of the following EU directives:

- 2014/30/EU - Electromagnetic Compatibility
- 2014/35/EU - Low Voltage

The following harmonized standards were applied:

- EN 61010-1:2010
- EN 61326-1:2013

Geretsried, November 2021

Frank R. Wagner
Managing Director

1.4.2 UK Declaration of Conformity

Hereby,

BYK-Gardner GmbH

Lausitzer Strasse 8

D-82538 Geretsried

declares, that the products of type **color2view** comply with the requirements of the following directives for Electromagnetic Compatibility (EMC) of the European Union (EU):

- S.I. 2016/1091 - Electromagnetic Compatibility Regulations
- S.I. 2016/1101 - Low Voltage

The following harmonized standards were applied:

- EN 61010-1:2010
- EN 61326-1:2013

Geretsried, November 2021

Frank R. Wagner
Managing Director

2

System Description

The color2view is a benchtop spectrophotometer which is operated by the touch screen display and the button **Operate**. The button is used to switch on the instrument and to trigger a measurement. On the touch screen display icons and functions can be selected directly.

The instrument can be used to repeatably measure color, gloss and fluorescence in the laboratory and in the production. The innovative BYK LED technology guarantees an outstanding performance in regards to short-term, long-term and temperature stability as well as highly repeatable and representative readings. Highest accuracy and inter-instrument agreement are ensured and allow you the use of digital standards. These digital standards can be shared easily the complete supply chain to set-up a global color management system.

Due to the excellent intra-instrument agreement between color2view (e.g. #7600) and spectro2guide (e.g. #7075) it is possible the share these digital standards between benchtop and portable color instruments.

NOTICE

With the purchase of the product you also get one day of training on the usage of the product and the software from BYK-Gardner.

2.1 Intended Use

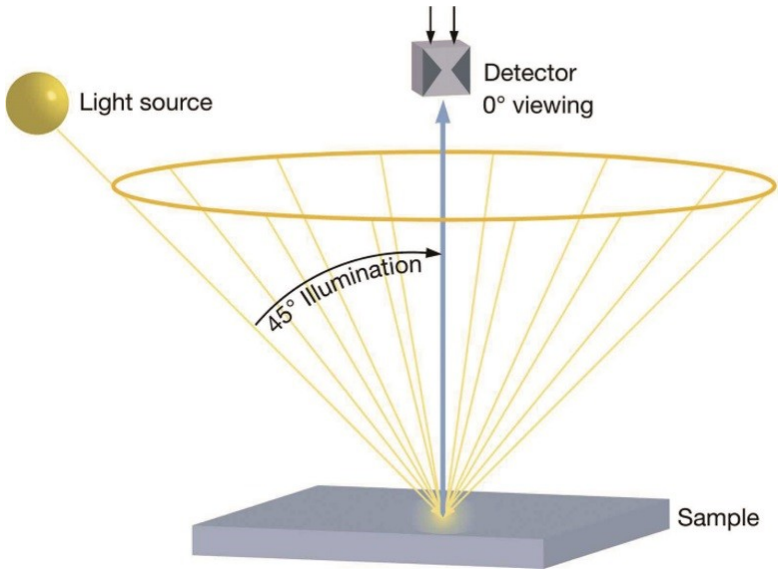
The color2view is a benchtop instrument for measuring color, gloss and fluorescence on different surfaces. It can be operated in horizontal or in vertical orientation. A retractable clamp can be used to fix the sample.

Via the integrated camera the current spot on the surface can be viewed on the display - allowing exact positioning of the sample.

By placing a sample on the measurement aperture and pressing either the button **Operate** on the display unit of the instrument or triggering the measurement directly on the touchscreen, the instrument measures the surface of the sample and processes, displays and stores the measured values in the system memory. The instrument can be connected via USB to a computer in order to read or write data. A capacitive touchscreen allows additional functions.

2.2 Measurement Principle

The instrument is available only with a 45°c:0° geometry: It uses 45° circumferential illumination and 0° viewing perpendicular to the sample plane. The circumferential illumination is essential to achieve repeatable measurement results on directional and structured surfaces.



The 45 / 0 geometry measures color as you see it. If we perceive a visual difference between sample and standard based on variations in gloss or texture, the 45:0 geometry will also measure a correlated difference.

2.3 Feature Matrix & Delivery Content

	color2view	color2view X	color2view Pro	color2view Pro X
				
Catalog number	7600	7604	7610	7605
Aperture	Fixed	Variable	Variable	Fixed
Aperture size / Measurement spot	Ø 32 / 22 mm	Ø 32 / 22 mm Ø 12 / 08 mm	Ø 32 / 22 mm	Ø 32 / 22 mm Ø 12 / 08 mm Ø 05 / 04 mm (*)
Digital standards	Yes			
Color measurement	Yes			
Gloss measurement	20° / 60°			
Fluorescence measurement	Yes			
Jetness measurement	No		Yes	
Delivery content	Spectrophotometer color2view White calibration standard Color and gloss test standard Certificate Software with two licensees for download: smart-lab (#7083)or smart-process Color (#7084) USB cable for data transfer Power supply Manual 1-day training			
Accessory items included		Medium aperture plate Aperture for illumination adjustment (medium) Tool kit for aperture change	Grey calibration standard Black test standard LED flashlight to check cleanness	Grey calibration standard Black test standard LED flashlight to check cleanness Medium aperture plate Aperture for illumination adjustment (medium) Small aperture plate Aperture for illumination adjustment (small) Tool kit for aperture change

(*) Gloss measurement not possible / exchange of digital standards not possible

Please contact BYK-Gardner if any item is missing or damaged, see Contact Information.

Retain the packaging in case you want to ship the instrument at a later date.

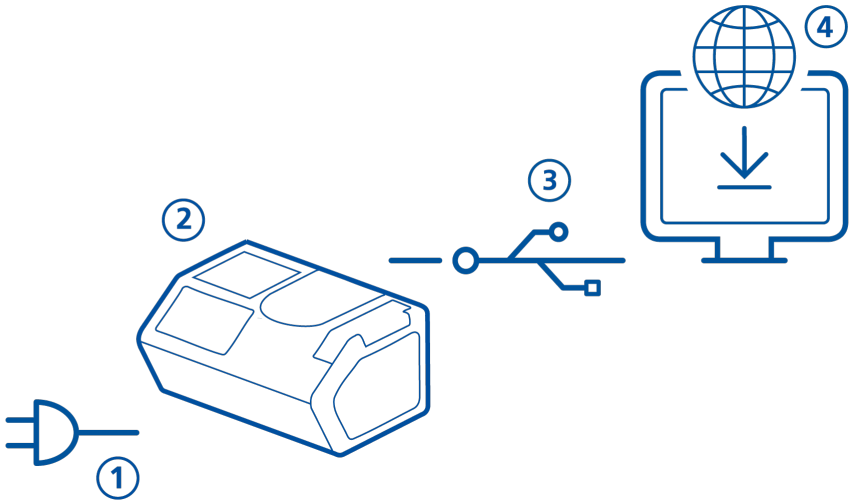
For more product details see https://www.byk-instruments.com/c/18612.

3

Getting Started

3.1 Instrument Set-up

The system consists of instrument, power supply and software for data transfer and analysis.



1. Connect power supply to instrument.
2. Connect foot switch to instrument (option).
3. Connect instrument with PC via USB cable.
4. Download and install smart-chart software.

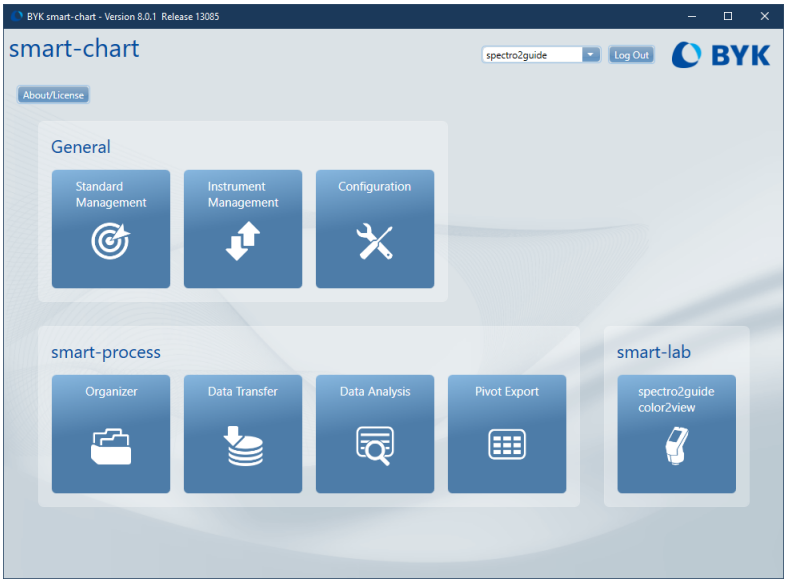
Instrument automatically turns on when the power supply is connected.

3.2 Software Installation

The software smart-chart is a modern and intuitive program to document, analyze and optimize color, gloss and fluorescence data. It is available in two different packages: smart-lab Color and smart-process Color.

Perform following steps:

1. Download the ZIP file from: https://www.byk-instruments.com/software
2. Save it on your hard drive into a new folder.
3. Extract the complete archive.
4. In the extracted folder, right mouse click on the file "install.exe".
5. Select **Run as administrator**.
6. Follow the setup instructions on the screen.



After download, the software can be used for **30 days** free trial. Thereafter, you need to decide and register for the required software package. The standard delivery includes two licenses for the selected software package.

How to activate the license?

Before activating the license, make sure to have a reliable internet connection.

1. Start smart-chart and click on **About/License** in the upper left corner of the screen. The license window opens and shows the license agreement.
2. Connect the instrument with the computer and click on the **License** tab.
3. Select the desired software by clicking on the appropriate **Validate License** button.
4. In case a license is available, the button **Import Online License** appears. Click on this button, fill in the registration form and click on **Register**.

The activation of the license is shown in the upper field **License Information**.

How to transfer the license?

If smart-chart needs to be transferred to another computer, the license needs to be returned from the actual computer:

1. Before returning the license, make sure to have a reliable internet connection.
2. Start smart-chart and click on **About/License** in the upper left corner of the screen.
3. The license window opens and shows the license agreement.
4. Find the respective software license in the upper field **License Information** and click on the **Return License** button.

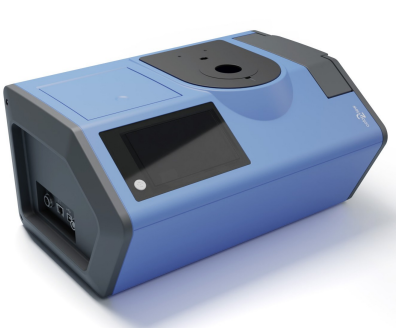
A confirmation is shown that the license was successfully returned. It can now be activated on the new computer.

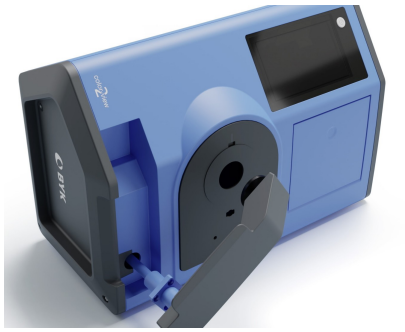
NOTICE

In case your computer has no internet connection, please refer to the "Offline Licensing" description in "C:\Program Files(x86)\BYKWARE\smart-chart3\Tools\OfflineLicense".

3.3 Orientation

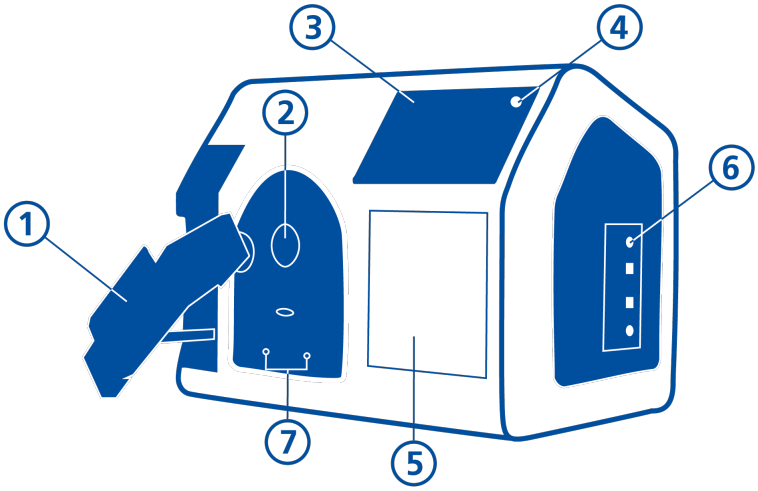
The instrument can be easily rotated to adapt the orientation: In horizontal setup the display is on the front and the measurement aperture is on the top. In vertical setup the display is in the upper right corner and the measurement aperture is on the left side in the middle.





Place the sample on the measurement aperture and fix it with the retractable clamp. In vertical set-up the sample can additionally be placed on a mountable sample holder. Adjust the high of the sample holder if necessary.

3.4 Control Elements

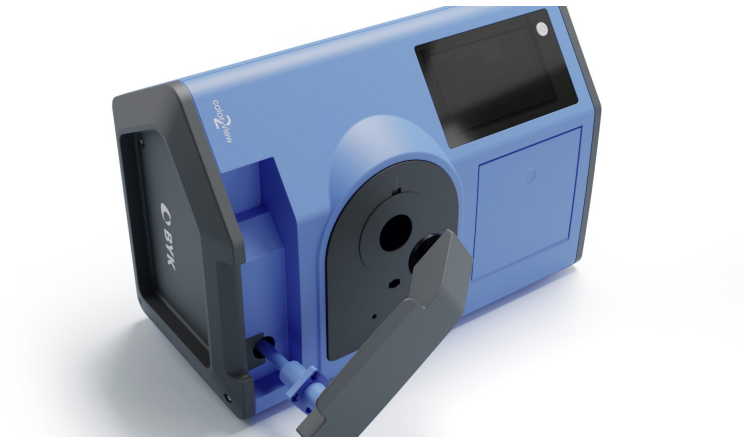


1	Retractable sample clamp	2	Measurement aperture
3	Touch-screen display	4	Button **Operate**
5	Storage for calibration and test standards	6	External connectors: Foot switch, USB type B, LAN, power supply
7	Openings for mounting external sample holder / balcony		

3.5 Functions of Parts

3.5.1 Sample Clamp

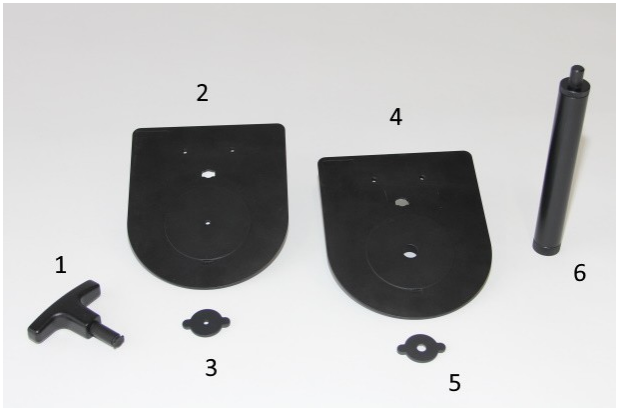
When not in use the sample clamp is stored flat in the housing. If you need the sample clamp you can pull it out of the housing and then move it to the side in the direction of the measurement aperture.



The sample clamp can be parked at several positions on its way to the measurement aperture. Thus, sensitive samples can be picked up with two hands - no need to hold the sample holder.

3.5.2 Exchangeable Aperture (X Models)

On the X models (#7604 and #7605) the aperture can be exchanged. For this an accessory set to adjust the illuminated and observed area is included.



1. Plate key
2. Aperture plate 5 mm
3. Aperture for illumination adjustment 5 mm
4. Aperture plate 12 mm
5. Aperture for illumination adjustment 12 mm
6. Magnetic lifter

For the usage of this set see System Configuration 54 > Measurement Parameter 55 > Aperture 56 .

3.5.3 Standard Storage

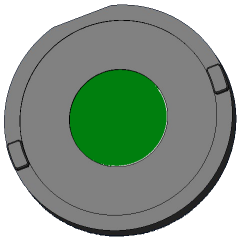
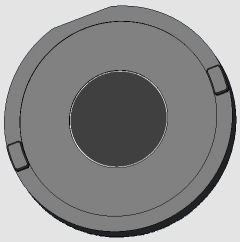
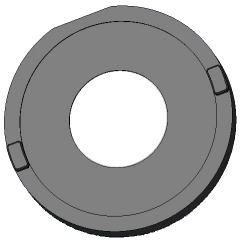
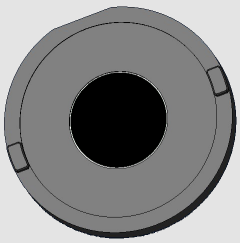
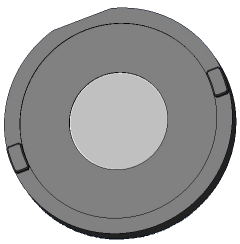
There is a compartment for the calibration and test standard under a flap. It is recommended to store the standards in the compartment after every use.

NOTICE

These standards have serial numbers. They are fix assigned to the instrument and can not be used with another instrument.

3.5.4 Calibration and Test Standards

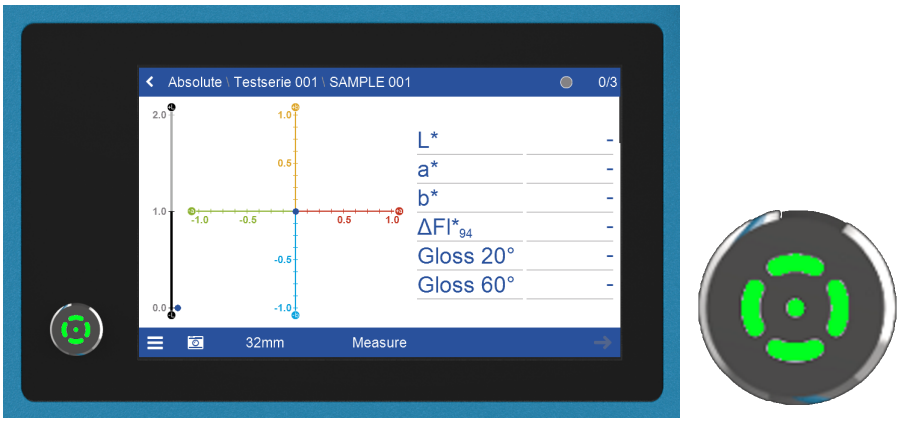
Following standards are included in delivery.

	Green standard: Color test
	Black standard: Gloss test
	White standard: Color and gloss calibration
	Deep black standard: Jetness test (Pro models only)
	Gray standard: Jetness calibration (Pro models only)

Consult Instrument Calibration 74 for details on the usage of these standards.

3.5.5 Button Operate / Status LED

The button **Operate** includes a status LED.



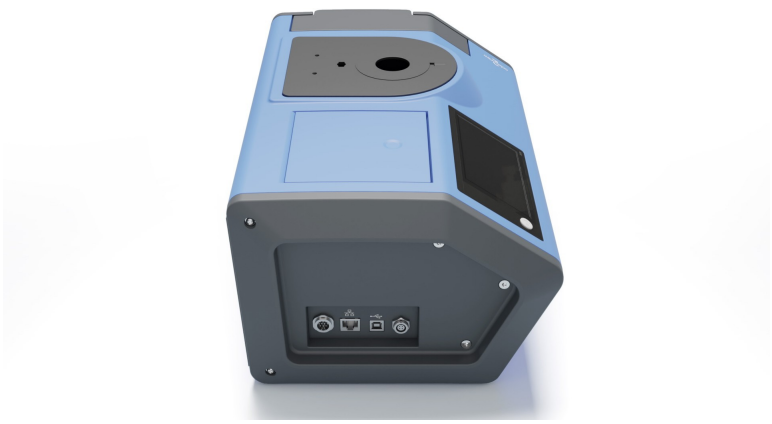
The colors of the LED have the following meaning:

- Green: Measurement successful.
- Red: Measurement failed.
- Blue: Fluorescence detected.
- Pink: Fluorescence exceeds limit.

Details for blue and pink see Fluorescence Measurement 41.

3.5.6 Side Connectors

On the side of the instrument the external connectors are placed.



Following connectors are provided - from left to right:

- Foot switch: Connect external foot switch (accessory).
- Network interface: Connect to PC to receive and transfer data via LAN.
- USB type B port: Connect to PC to receive and transfer data via USB.
- Power supply: Connect external power supply here.

3.5.7 Power Supply

Power is provided by a proprietary power supply with a standard power cable.

This power supply has following specifications:

- Input: 100 - 240 V ~ , 50 - 60 Hz, max. 1A
- Output: 12 V ⎓ , max. 3A

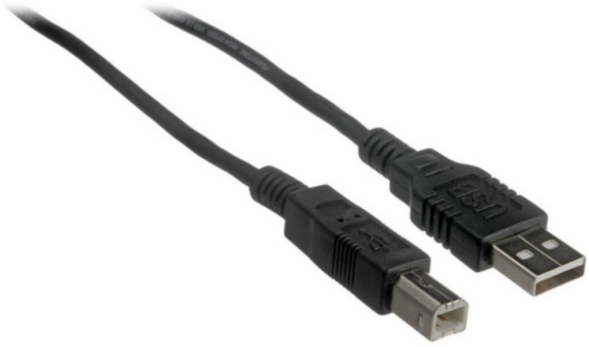
Use only the power supply included with delivery.

3.5.8 USB Cable

NOTICE

Before using the USB connection, refer to Software Installation 16 ", in order to install the necessary device drivers in the operating system of your computer.

The USB cable type A to type B is used to connect the instrument to a computer for data transfer.



Insert the type B plug into the corresponding socket on the side of the instrument. Insert the type A plug into the corresponding socket on your computer.

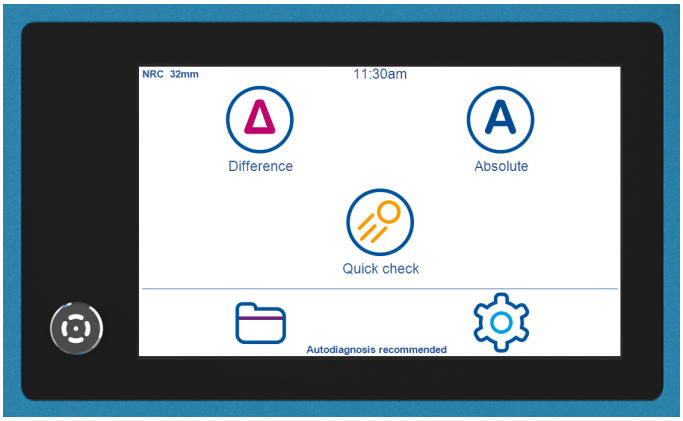
After power on both instrument and software are ready to use.

3.6 System Operation

The instrument is operated using the touch-screen display to select functions and the button **Operate** to trigger a measurement. Using the software smart-chart the full potential of the instrument is tapped.

3.6.1 Main Menu / Display

The display unit contains the touch-sceen display and the button **Operate** with status LED. After powering on the instrument the main menu is shown. The icons below are displayed by default.



Difference: Compare standard and sample. Results are saved automatically.	**Absolute**: Take absolute measurements without compare. Results are saved automatically.
Quick Check: Perform quick evaluations without saving.	**Browse**: View and delete measurement data in system memory.
Configuration: Change measurement parameter or instrument settings and calibrate instrument.	Button **Operate**: For the meaning of the LED colors in the button see Status LED 22 .
NRC: Activate under **Configuration** > **Measurement Parameters** > **Traceable to**.	**32mm**: Check / select under **Configuration** > **Measurement Parameters** > **Aperture**.

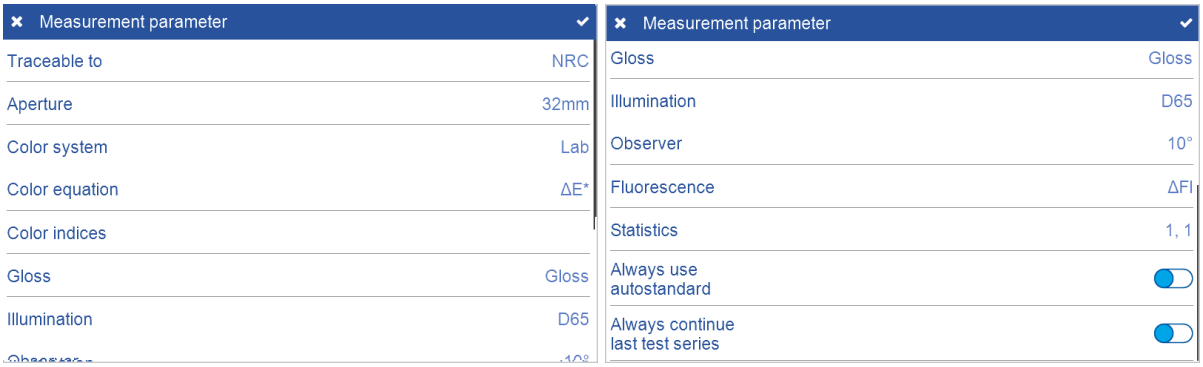
Additional Information

Two more icons can be displayed - depending on whether you have activated **Opacity** in the configuration menu or downloaded an **Organizer** from smart-chart.

	**Opacity**: Activate under **Configuration** > **Measurement Parameters** > **Color Indices**.
	**Organizer**: Download at least one organizer from smart-chart.

3.6.2 Default Values / Settings

The instrument is working with default measurement parameters. Before you start measurements, these parameters must be controlled and, if necessary, adjusted to individual specifications. For more details see System Configuration 54 > Measurement Parameter 55 .



Traceable to Select traceability mode: The measurement results are in accordance with the calibration traceable to the National Research of Canada or the predeccessor instrument color-view. Default is **NRC**.	**Illumination** Select standard illuminant. Default is **D65**.
Aperture Select aperture mounted on the instrument. Default is **32 mm**.	**Observer** Select standard observer. Default is **10°**.
Color system Select color system. Default is **CIE L*a*b***.	**Fluorescence** Activate these scales to predict color stability. Default is **ΔFl**.
Color equation Select color equation. Default is **ΔE***.	**Statistics** No. of readings to be taken per standard or per sample. Statistics are evaluated, if **n > 1**.
Color indices Select color indices. Default is **none**.	**Always use autostandard** Search for closest standard is always active.
Gloss Turn gloss measurement on or off.	**Always continue last test series** No new test series is created; latest series is opened automatically.

NOTICE

Changes in the measurement parameters apply to new standards only. Existing standards with measurement data will be measured with previous parameter in order to ensure data consistency.

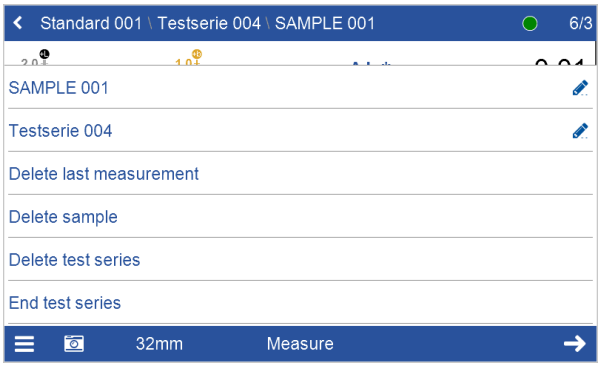
3.6.3 Common Functions

The color2view provides an easy-to-use graphical interface which supports to you speed ab your daily work. Following common functions are available:

- Context Menu[26]: Allows you to control your current test series.
- Filter Function[27]: Allows you to shorten the list of standards displayed.
- Camera Preview[28]: The integrated camera can be switched on and off.
- Current Aperture[29] : The current aperture setting is indicated on the display.

3.6.3.1 Context Menu

Ongoing measurements are controlled via the context menu - available via the hamburger menu icon in the lower left corner of the display. The context menu starts with less entries and grows up during measurements.

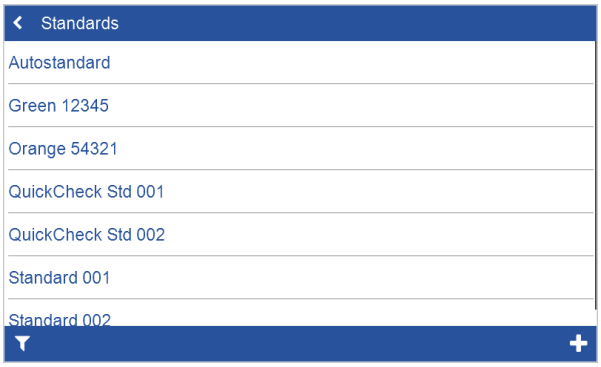


Finally the context menu provides following options:

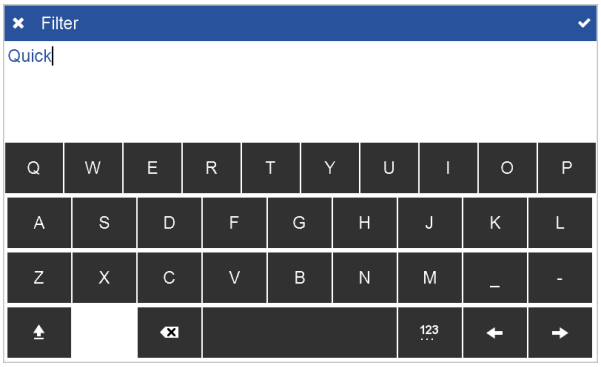
- Rename sample
- Rename test series
- Delete last measurement
- Delete complete sample
- Delete test series
- End test series

3.6.3.2 Filter Function

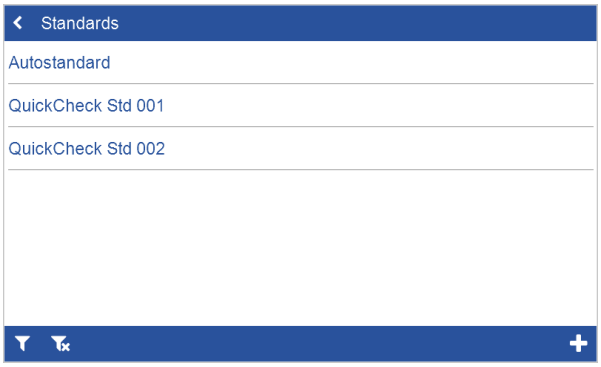
The instrument provides a function to filter standards. This is helpful in case of many standards being stored in the instruments memory.



Click on the filter icon in the lower left of the display. The screen to enter the filter criteria is displayed.



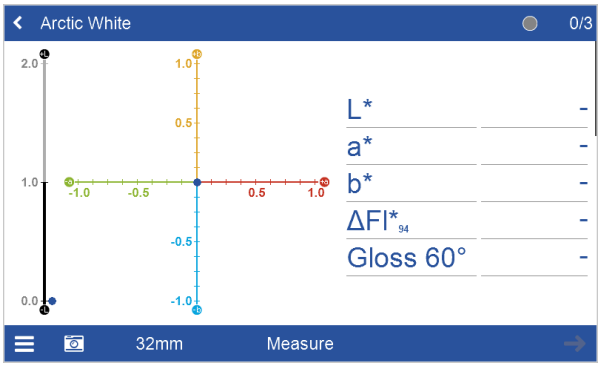
Enter the criteria for the filter - i.e. a part of the standard name. To change the filter criteria click the filter icon again.



To remove the filter click the cancel filter icon.

3.6.3.3 Camera Preview

In the measurement mode a small camera icon is displayed in the blue bar at the bottom.



Click the icon to switch the live preview on or off.

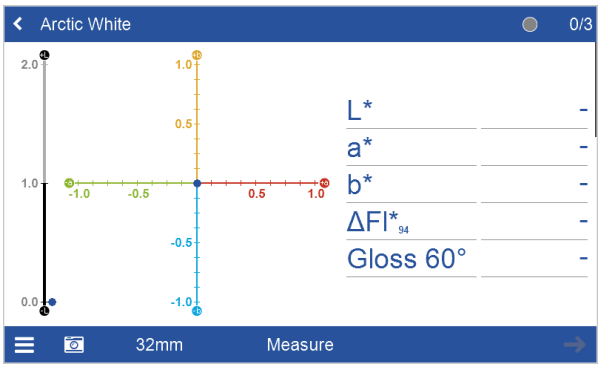
The camera image is shown on the touch screen display. The measurement can be triggered directly in this menu or the preview can be closed again using the function "Off".

NOTICE

Using the live preview of the measurement spot it prevents false readings on imperfections or scratches and ensures precise positioning of the sample.

3.6.3.4 Current Aperture

The **color2view** (#7600) and **color2view Pro** (#7610) comes with a 32 mm measurement aperture. This can be seen in the Main Menu[24] . The aperture is also shown in the measurement screen in the blue bar at the bottom - right to the camera icon.



The X models **color2view X** (#7604) and **color2view Pro X** (#7605) have a variable measurement aperture - the aperture can be exchanged on the instrument. Details see System Configuration[54] > Measurement Parameter[55] > Aperture[56] .

4

Perform Measurements

Following measurements are supported:

4.1 Difference Measurement

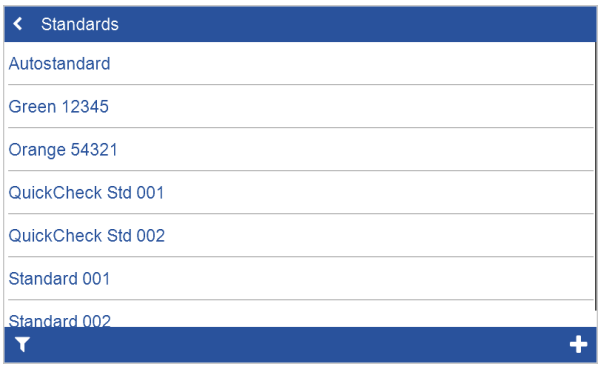
In the difference mode following measurements are supported:

- Load existing Standard 31 : Compare sample(s) to a standard.
- Search for closest Standard 33 : Search for best match in memory.
- Create new Standard 35 : Create standard based on current sample.

To start difference measurement mode click on icon **Difference**.

4.1.1 Load existing Standard

In case standards are already stored in the instrument - see Create new Standard 35 - or downloaded from smart-chart - the list with existing standards appears.

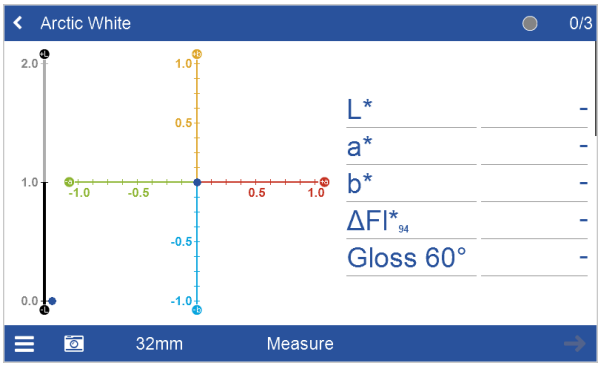


Select a standard to continue. The list with existing test series appears.

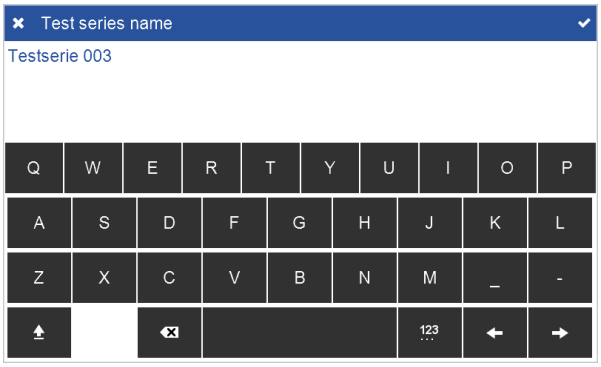
You have two options:

- To continue existing test serie select it from list.
- To add a new test serie click on item **New test series**; a new test serie will be created created.

The measurement screen is displayed.



Select **Rename test series** from context menu, if required.



Enter the name and confirm via the check mark in the upper right corner, the instrument is ready to measure. Proceed with following steps:

1. Place sample on instrument.
2. Click on **Measure** or press the **Operate** button.
3. Sample is measured and automatically saved.
4. Scroll down to see data table and statistics.
5. Continue with the next sample, if required.

To end difference mode select **End test series** from context menu.

NOTICE

There are various options to configure the display of the measurement results, e.g.:

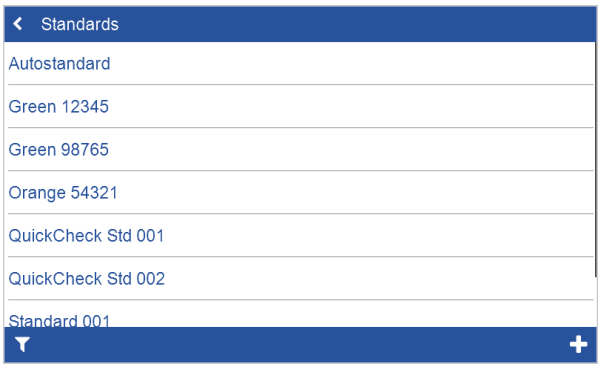
- Display absolute values for standard and sample
- Display differences between standard and sample
- Display statistical data with 1..3 columns
- Activate / inactivate fixed statistics etc.

Details see Measurement Parameter 55 > Measurement Screen 62.

4.1.2 Search for closest Standard

Using this function you can measure any sample - the system will automatically present the standard(s) in the instrument, which are closest to the current sample.

Click on icon **Difference**. The list with existing standards is displayed.

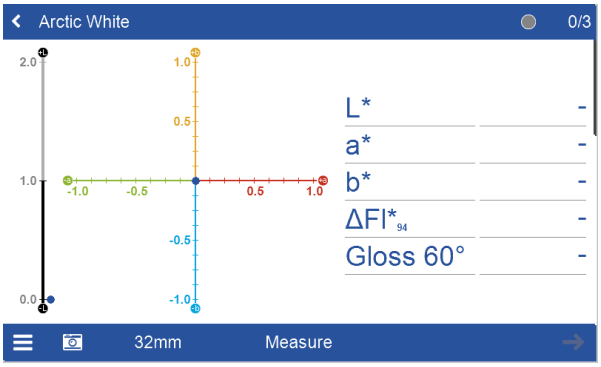


Click on item **Autostandard**.

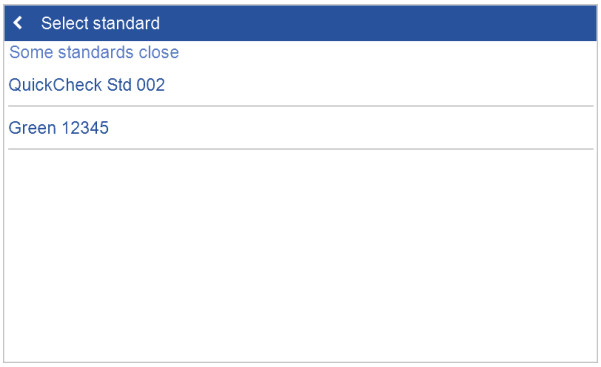
NOTICE

The option **Autostandard** only appears when at least one standard is stored in the instrument.

The measurement screen is displayed.



Measure your current sample **just one time**, the instrument measures the current sample and searches for the closest standard in the memory.



Following scenarios are supported:

- **Nearest standard found**: If matching standard is found in memory, it is selected automatically.
- **Some standards close**: If more than one matching standard is found in memory, a list for selection is displayed.
- **No good match**: No matching standard was found in the instrument.

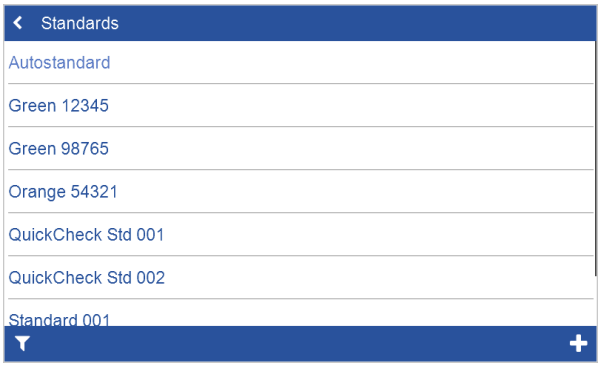
If a matching standard was found you can continue to measure samples and compare with this standard.

NOTICE

The option **Autostandard** can be set to always active. Details see Measurement Parameter 55 > Autostandard 68 .

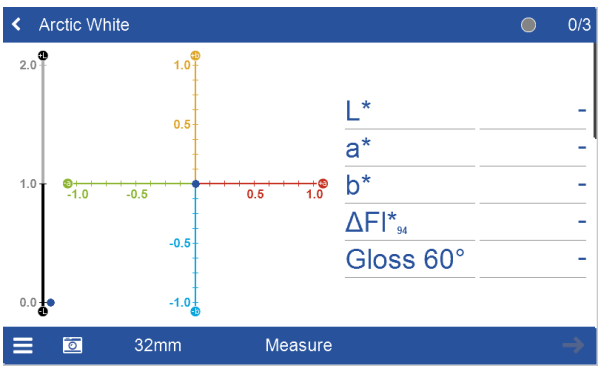
4.1.3 Create new Standard

Using this function you can create new standards. Click on icon **Difference**. The list with existing standards is displayed.



To add a new standard click on the **Plus** symbol **(+)**; a new standard is created and the input for the standard name appears.

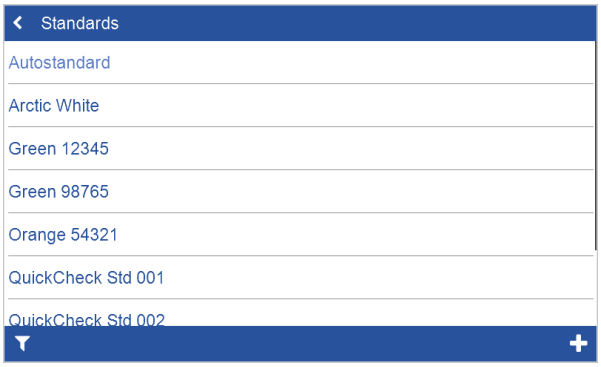
Accept the default name or enter a desired name and click on the check mark in the upper right corner. The instrument is now ready to measure the current standard.



Proceed with following steps:

1. Use the camera icon to switch the camera preview on or off.
2. Check the aperture currently selected in Measurement Parameter 55.
3. Place standard on instrument.
4. Click on **Measure** or press the **Operate** button.
5. Standard is measured and automatically saved.

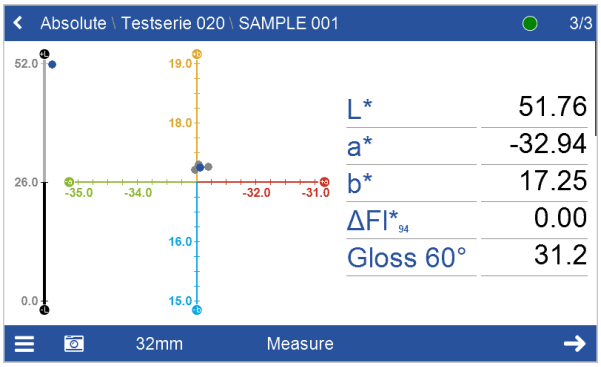
Now the measured sample exists as new digital standard in instrument memory.



Transfer the new data to smart-chart to import it into the measurement database. From here the new standard can be shared with all other locations in the world.

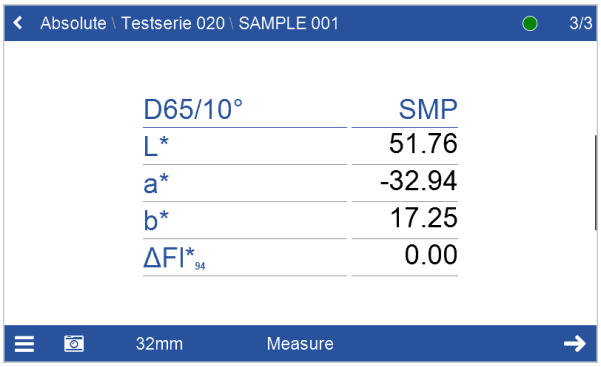
4.2 Absolute Measurement

Using this function you can take measurements without comparing to a standard. Click on icon **Absolute**.



Proceed with following steps:

1. Place sample on instrument.
2. Click on **Measure** or press the **Operate** button.
3. Sample is measured, results are automatically saved.
4. Scroll down to see data table and statistics.

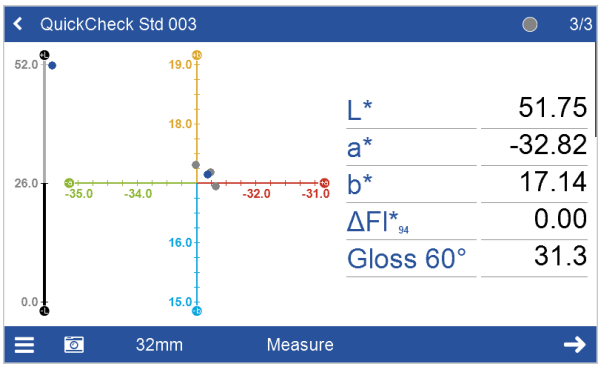


Continue with the next sample, if required. To end absolute mode select **End test series** from context menu.

4.3 Quick Check

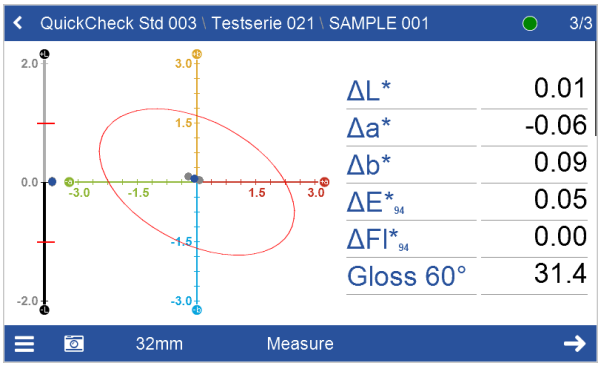
Using this function you can compare a standard with one or more samples without automatic saving - use it for the quick evaluation of your current samples.

Click on icon **Quick check**. The instrument is ready to measure the *standard*.



Proceed with following steps:

1. Place instrument on *standard*.
2. Click on **Measure** or press button **Operate** to measure the *standard*.
3. Continue with **Next** and place instrument on the *sample*.
4. Click on **Measure** or press button **Operate** to measure the *sample*.



Continue with the next sample, if required. To end quick check mode select **End test series** from context menu.

NOTICE

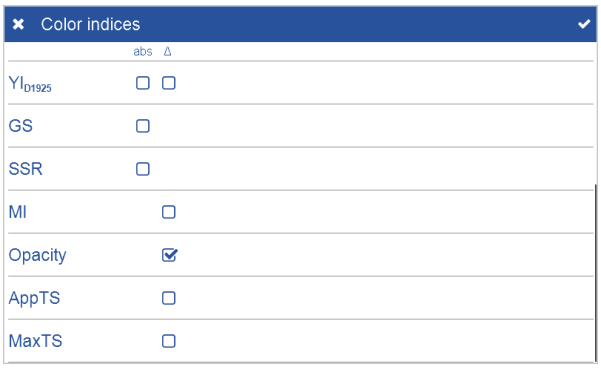
Measurements are not saved by default. To save the standards and samples measured select item **Save data** from the context menu.

4.4 Opacity Measurement

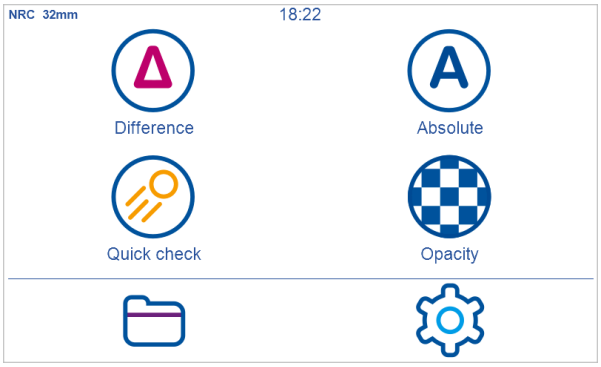
With this function the hiding power of a coating can be measured - using for example the BYK-Gardner **byko-charts**:

- https://www.byk-instruments.com/c/p-5916

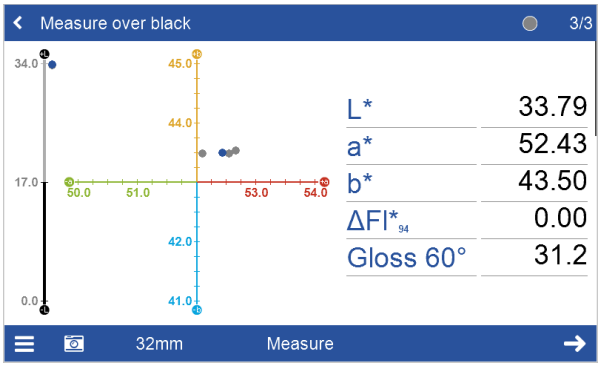
To display the measurement icon in the main menu, **Opacity** has to be selected as a color index, see Color Indices 60 .



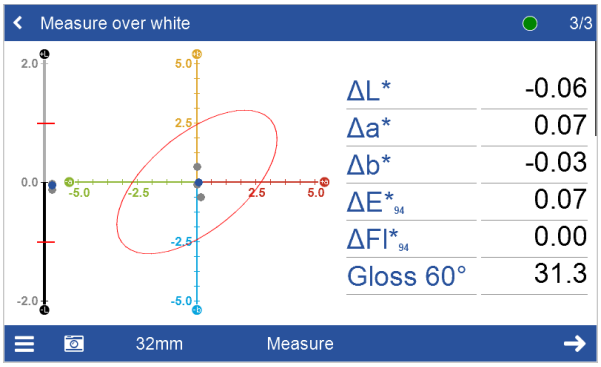
In the main menu click on icon **Opacity**; the measurement starts with the reading over *black* and finishes with the reading over *white*.



Place instrument on the *black* background and click on **Measure** or press the **Operate** button.

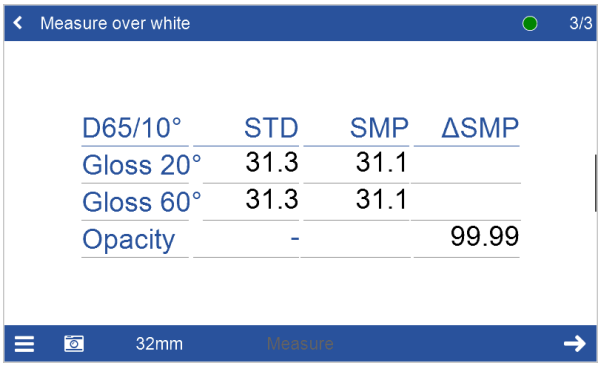


The sample is measured and automatically saved; continue with **Next** and place instrument on the *white* background.



Click on **Measure** or press the **Operate** button; the sample is measured again and automatically saved.

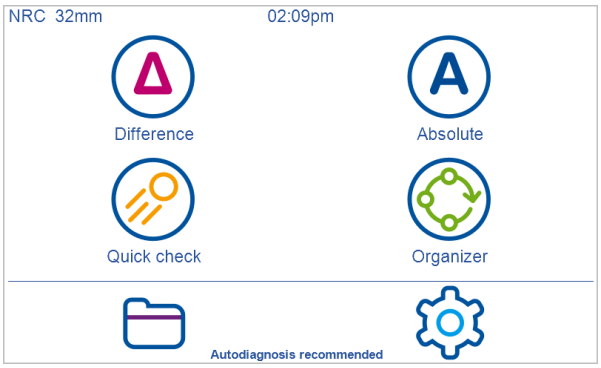
Scroll down to see the **Opacity** value in %. A higher value indicates that the hiding power of the coating is good.



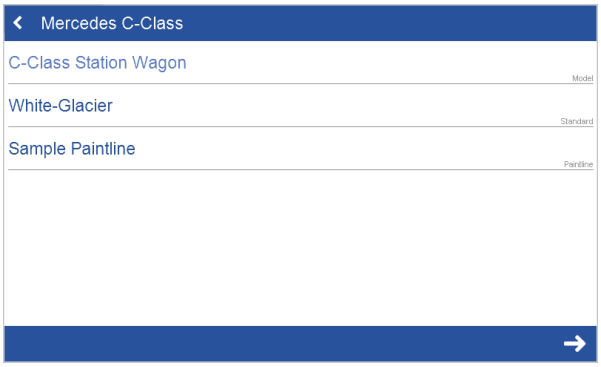
To end quick check mode select **End test series** from context menu.

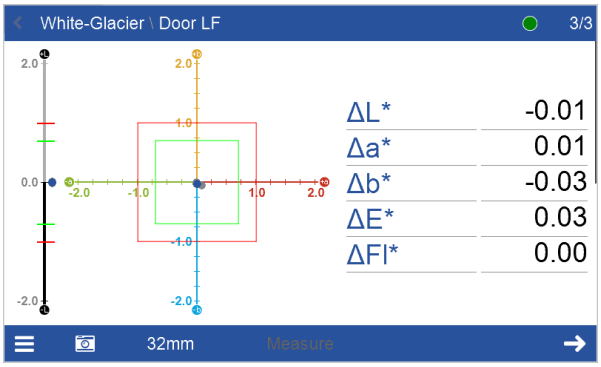
4.5 Organizer Measurement

It is possible to predefine the measurement sequence in the software smart-process with the so-called "organizer" - allowing a standardization of the measurement procedure. The organizer icon appears after downloading an organizer from smart-process into the instrument. Multiple organizers can be downloaded to the instrument. Select the organizer to be used from the list.



Afterward the objects in the organizer can be selected - for example car model, color / standard and the paint line in the production. Continue with **Next**; the organizer will guide step by step and check zone by check zone you through the whole measurement process.



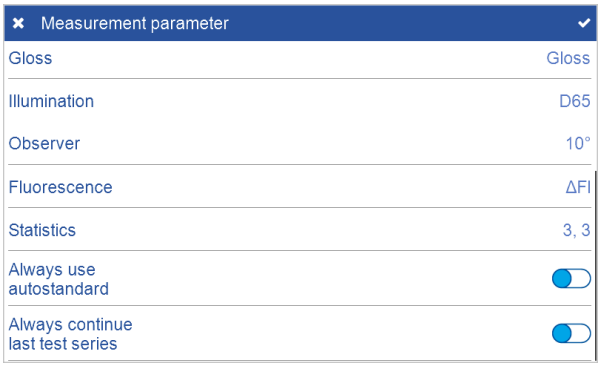


NOTICE

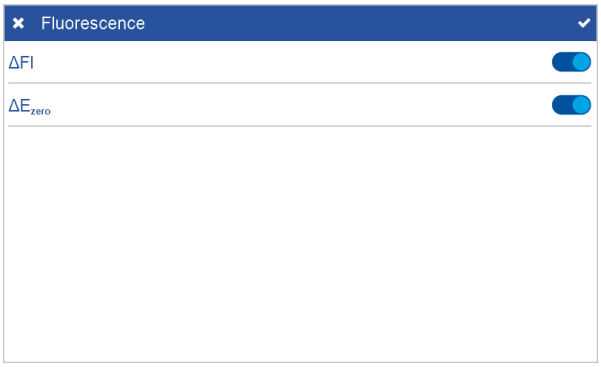
Details about smart-process can be found in the document "Guide-s2g-c2v-with-smart-process-225026146". This document describes how to operate smart-process with spectro2guide. The operation of smart-process with color2view is identical.

4.6 Fluorescence Measurement

The color2view can detect fluorescent light excited in UV and visible range. With this function you can predict the longterm color stability. Monochromatic illumination is used to excite fluorescent material in the sample. For this the instrument is equipped with additional monochromatic LEDs. To measure fluorescence, the corresponding indices have to be activated in the Measurement Parameter 55 .



Select the item **Fluorescence**; the list of fluorescent indices is displayed.



Following indices are available:

- **ΔFI**: Indicates whether and how much fluorescent energy is emitted. The original specimen are compared to the specimen after the estimated fluorescence degradation.
- **ΔE_{zero}**: Calculates the estimated color difference after the fluorescence of standard and sample has decayed.

Place instrument on flourescent sample and measure it, see for example Difference Measurement 31 .

The status of the fluorescence detection is signaled via an acoustic and a visual signal.

For the visual signal the status LED on the top of the instrument is used:

- **Status LED = Blue**: Fluorescence has been detected.
  - Emitted energy > 1% of excited energy.
  - This must apply to at least 1 of the 12 monochromatic LEDs.
- **Status LED = Pink**: Fluorescence exceeds predefined limit.
  - The difference has to be larger than 1/3 of the tolerance due to fluorescence.
  - This tolerance value can be customized in the software smart-chart.

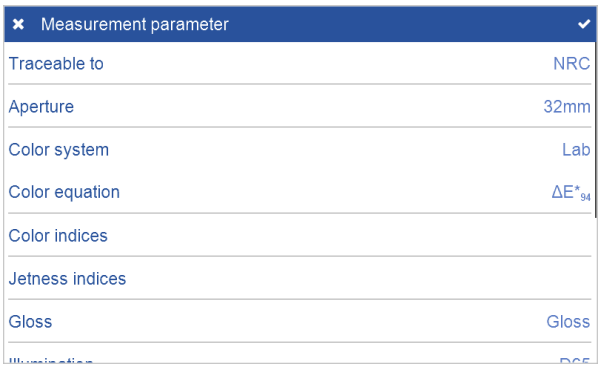
A quantification of the fluorescent light is possible with the "Fluorescence" slider in the software smart-chart.

A calculation is made for the color data after fluorescence has decayed - for example due to the impact of sunlight.

4.7 Jetnesss Measurement

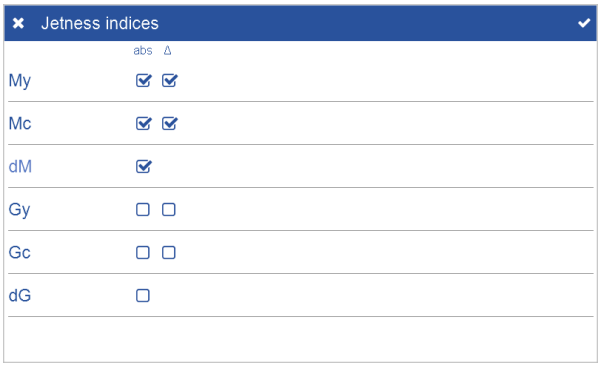
The color2view Pro and color2view Pro X can measure the jetness of deep black colors with special indices.

To switch the instrument into jetness measurement mode the corresponding indices have to be activated. Go to **Configuration** > **Measurement parameter** > **Jetness indices**.

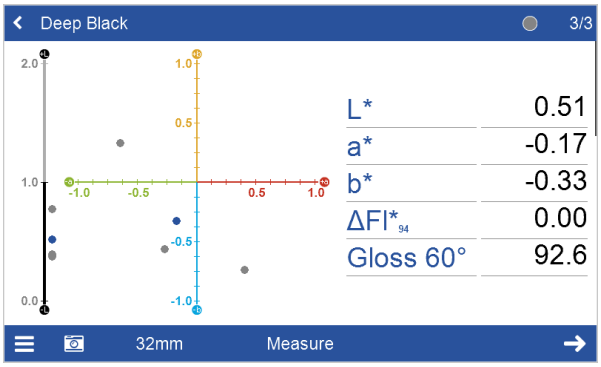


For blackness / jetness measurement following indices are available:

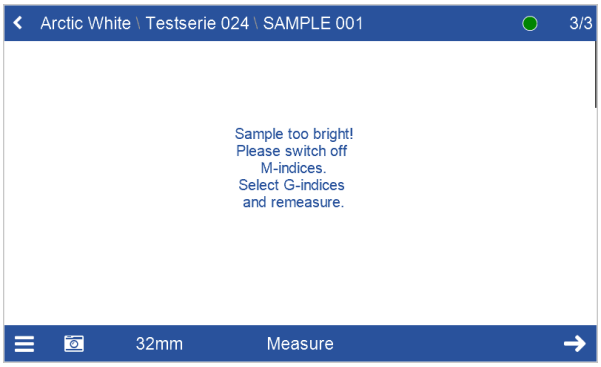
- **My**: Blackness determines the lightness of black without colored undertone.
- **Mc**: Jetness determines the color depending black value.
- **dM**: Undertone determines the absolute contribution of hue.



Place instrument on deep black sample and measure it, see for example Difference Measurement 31 .



Activating these indices changes to a different measuring mode in the instrument - which can be used for samples with deepest black only. If measuring other colors an error message will appear.



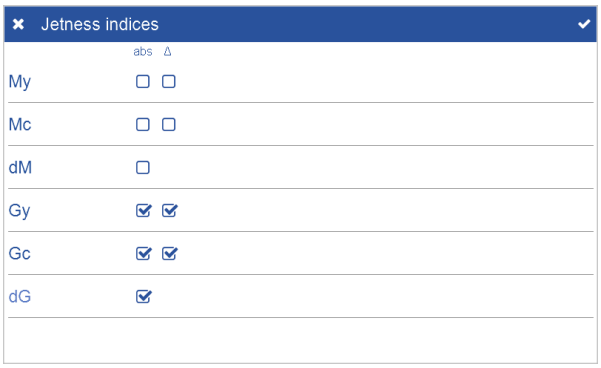
To measure all other colors, deactivate the jetness indices. This changes the instrument back to the default measuring mode.

NOTICE

An LED flashlight is included in delivery to check deep black samples and the separate jetness standards for cleanliness before use. For the best usage see Cleaning Jetness Standards (Pro Models) 86 .

4.8 Grayness Measurement

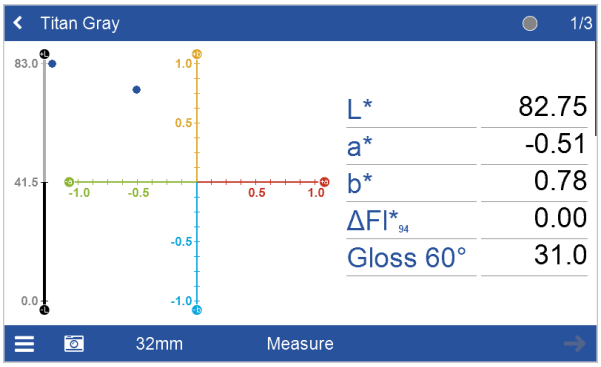
The color2view Pro and color2view Pro X provides additional indices for the measurement of gray colors. The same standardized calculations are used as for jetness, but lighter tones than jet black can also be measured. Go to **Configuration** > **Measurement Parameters** > **Jetness indices**.



For grayness measurement following indices are available:

- **Gy**: Indicates the gray value of a sample.
- **Gc**: Indicates the hue-dependent gray value of a sample.
- **dG**: Indicates the hue of a gray color.

Place instrument on gray sample and measure it, see for example "Difference Measurement[31] ".



The measurement of gray samples takes place in the normal color measurement mode.

NOTICE

To measure gray samples deactivate the jetness indices **My**, **Mc**, **dM** and just activate the grayness indices **Gy**, **Gc**, **dG**, see Jetnesss Measurement[42] .

4.9 Granules Measurement

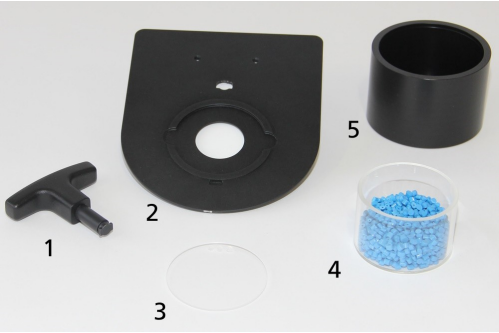
The measurement of plastic pellets can be done using the accessory "Granules Measurement Kit" or "Automatic Sample Rotator". Gloss is not measured for plastic pellets.

NOTICE

It must be ensured that granules are not measured (regardless of which kit is used) without first performing the appropriate calibration.

4.9.1 Granules Measurement Kit

For an affordable and easy manual measurement of pellets every color2view model can be extended by the “Granulate Measurement Kit” (#7607).



1 Plate Key (#7613)

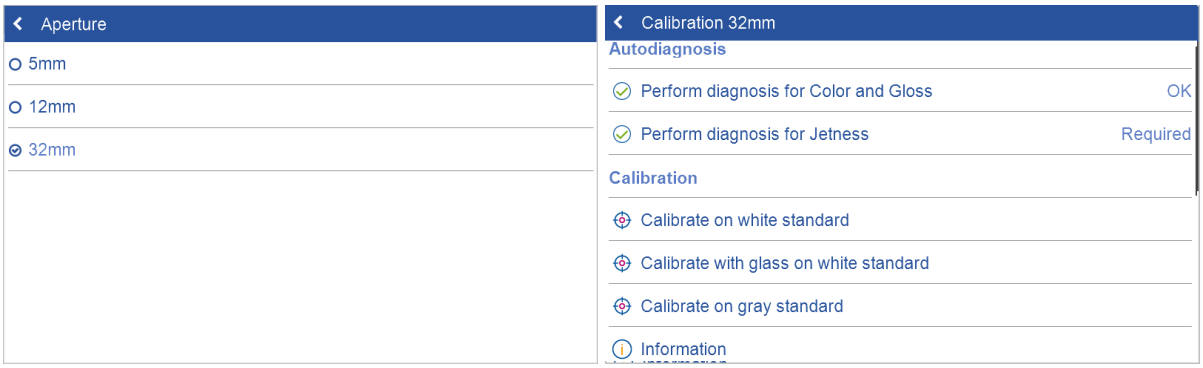
2 Aperture Plate for Glass Cuvette (#7614)

3 Glass Sample Plate (#6135)

4 Glass Sample Cup (#6136)

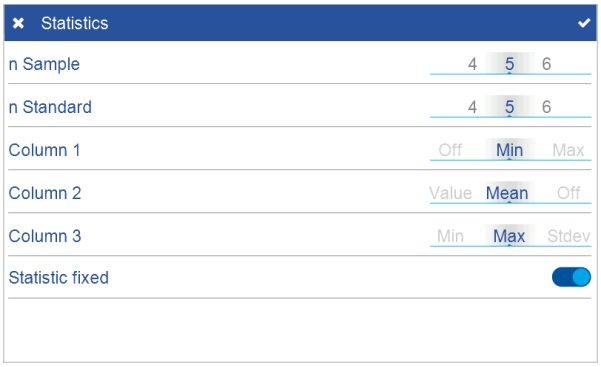
5 Sample Cup Cover (#7609)

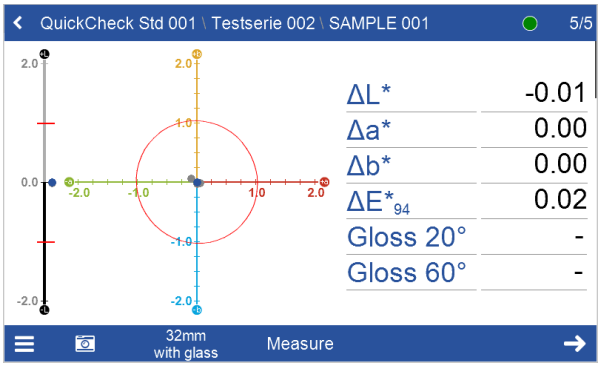
The measurement of plastic pellets takes place with the aperture "32 mm". This can be checked in **Configuration** > **Measurement Parameter** > **Aperture**.



1. Remove standard aperture plate 32 mm using the Plate Key **(1)**.
2. Attach the Aperture Plate for Glass Cuvette 32 mm **(2)**.
3. Insert the Glass Sample Plate **(3)** into the recess of the aperture plate.
4. Place White Calibration Standard on top of the Glass Sample Plate.
5. Go to **Configuration** > **Calibration** and select **Calibrate with glass on white standard** (available only if aperture is set to "32 mm").
6. The instrument will guide you through the calibration procedure.
7. Remove the Glass Sample Plate and the White Calibration Standard.
8. Fill the Sample Cup **(4)** with plastic pellets and attach black Cup Cover **(5)**.
9. Attach the Glass Sample Cup to the Aperture Plate for Glass Cuvette.

10. Go to **Configuration** > **Measurement Parameter** > **Statistics**.
11. Select the desired number of readings "n" per measurement.



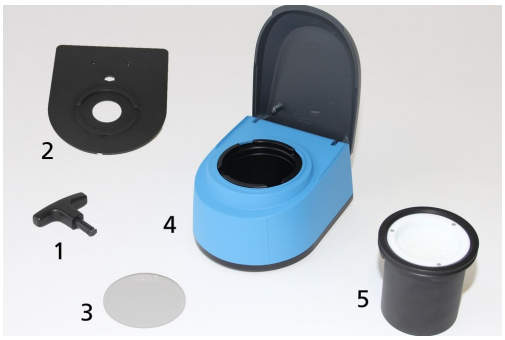


12. Go back to the main menu and perform a measurement.
13. Measure the granules standard first and then the sample(s).
14. Between readings empty the sample cup and fill it again.
15. Perform the required number of readings for each sample.
16. To end measurement mode, select **End test series** from menu.

For normal measurement mode exchange the aperture and perform white calibration again.

4.9.2 Automatic Sample Rotator

For a repeatable and reliable measurement of pellets with minimal operator influence every color2view model can be extended by the “Automatic Sample Rotator” (#7603).



1 Plate Key (#7613)

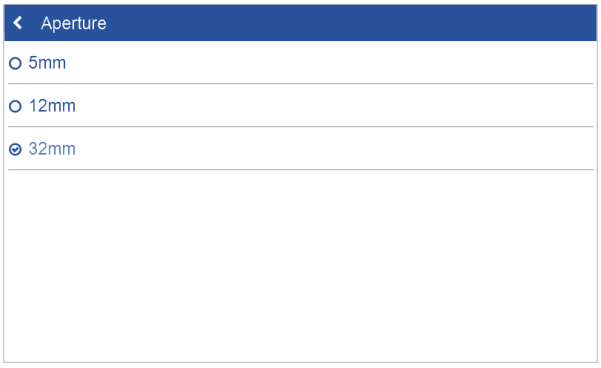
2 Aperture Plate for Glass Cuvette (#7614)

3 Glass Sample Plate (#6135)

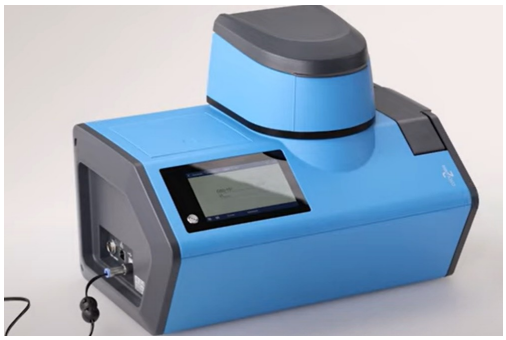
4 Sample Rotator (#7603)

5 Sample Cup (comes with rotator)

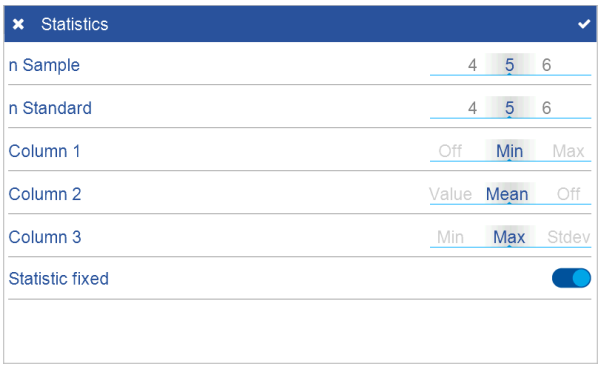
The measurement of plastic pellets takes place with the aperture "32 mm". This can be checked in **Configuration** > **Measurement Parameter** > **Aperture**.

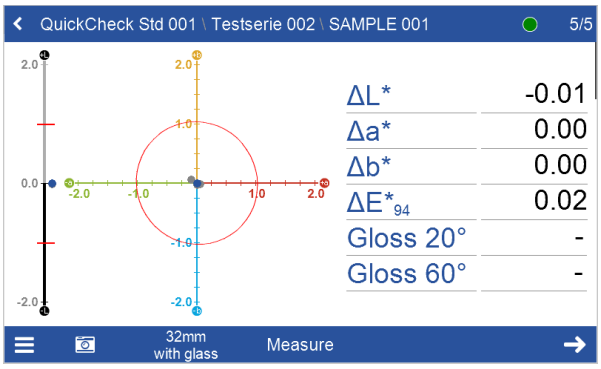


1. Remove standard aperture plate 32 mm using the Plate Key **(1)**.
2. Attach the Aperture Plate for Glass Cuvette 32 mm **(2)**.
3. Insert the Glass Sample Plate **(3)** into the recess of the aperture plate.
4. Place White Calibration Standard on top of the Glass Sample Plate.
5. Go to **Configuration** > **Calibration** and select **Calibrate with glass on white standard** (available only if aperture is set to "32 mm").
6. The instrument will guide you through the calibration procedure.



7. Remove the Glass Sample Plate and the White Calibration Standard.
8. Remove the Aperture Plate for Glass Cuvette using the Plate Key.
9. Attach the Automatic Sample Rotator **(4)** on top of the color2view.
10. Fill the Sample Cup **(5)** with the plastic pellets to be measured.
11. Insert the cup into the rotator and close the rotators cover.
12. Go to **Configuration** > **Measurement Parameter** > **Statistics**.
13. Select the desired number of readings "n" per measurement.





14. Go to the main menu and perform for a measurement.
15. Measure the granules standard first and then the sample(s).
16. The rotator turns the internal sample cup automatically.
17. Several readings are performed per rotation (ca. five).
18. The rotator stops after the required number of readings.
19. To end measurement mode, select **End test series** from menu.

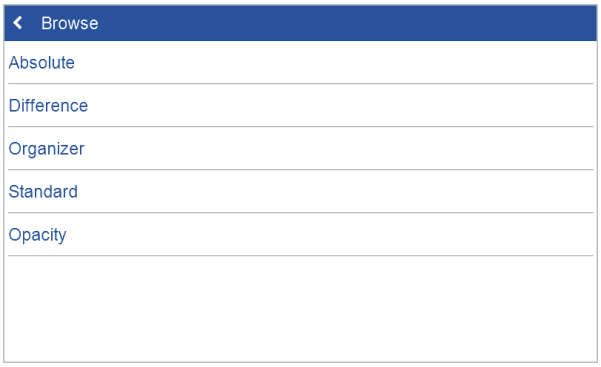
To switch back to standard measurement mode, exchange aperture plate and perform white calibration (without glass plate).

5

Browse Measurements

Using this function you can view measured data and / or delete existing standards or test series.

Click on icon **Browse**. The list with all types of measurements is displayed.



You can browse through the list in order to view or delete the data. Following operations are supported:

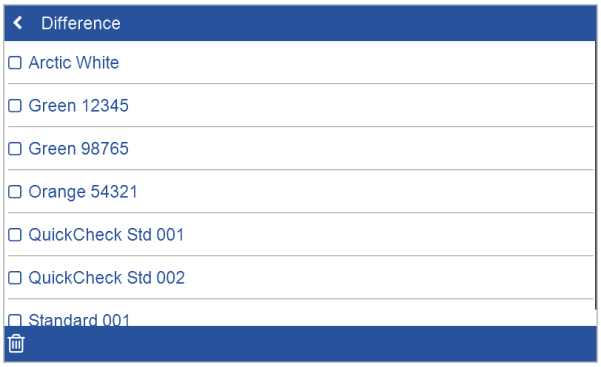
- View Measurement Data 49
- Delete Test Series 50
- Delete Standard 52

NOTICE

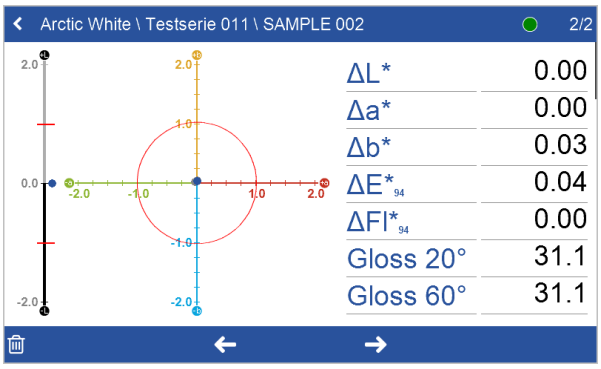
You can also use the software smart-chart in order to delete stored measurement values or complete standards from instrument memory.

5.1 View Measurement Data

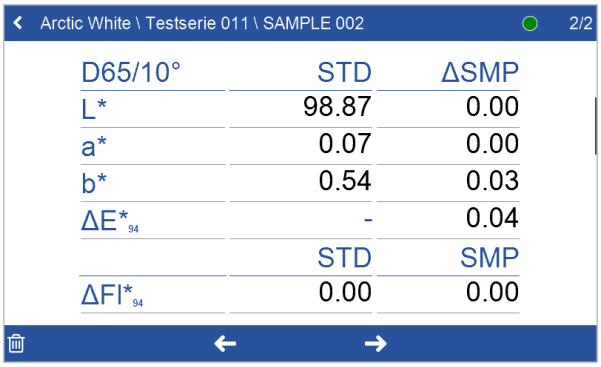
In the list of measurement types open the object for which you want to view the measured data - for example **Difference**. The standards for which test series were measured are displayed.



Open the desired object to view the measurement data.



Scroll down to view data values and statistics.



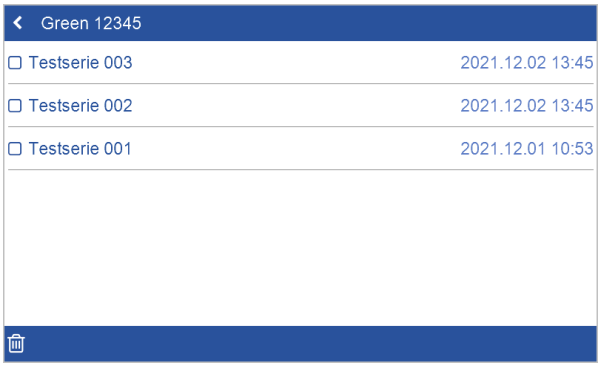
Use the **Previous** / **Next** icons to navigate through the different samples measured.

NOTICE

The values show are the average values for all measurements on this sample.

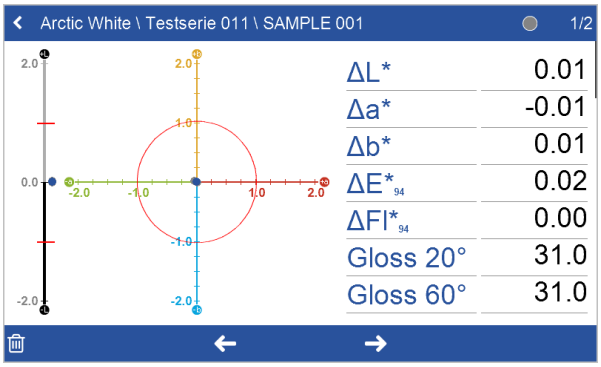
5.2 Delete Test Series

To delete a single test series from a standard select **Difference** in the Browse 49 menu, click on the standard to open it and select the test series to be deleted in the list.



Click on the **Trashcan** icon. A confirmation dialog is displayed.

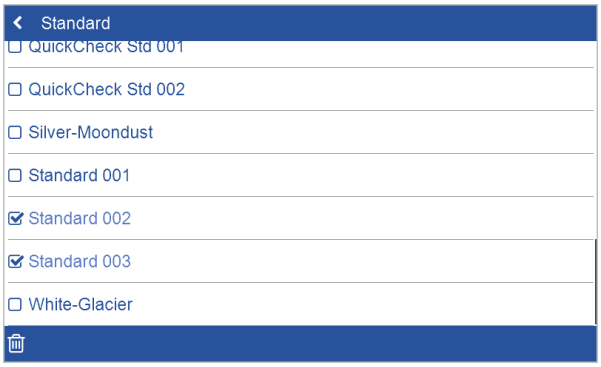
Confirm with the check mark in the upper right corner. The selected objects are deleted. To abort the deletion click on the cross icon to leave the dialog.



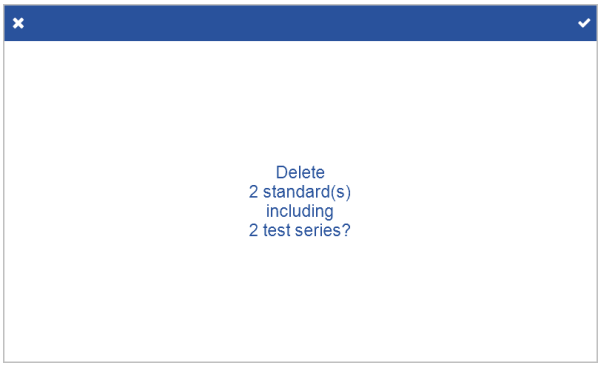
If only on single test series exists in the standard, it can also be deleted directly from the measurement screen using the **Trashcan** icon.

5.3 Delete Standard

You can delete complete standards with all their test series stored from instrument memory. In the Browse 49 menu click on **Standard** and select the standard(s) to be deleted in the list.



Click on the **Trashcan** icon. A confirmation dialog is displayed.



Confirm with the check mark in the upper right corner. The selected objects are deleted. To abort the deletion click on the cross icon to leave the dialog.

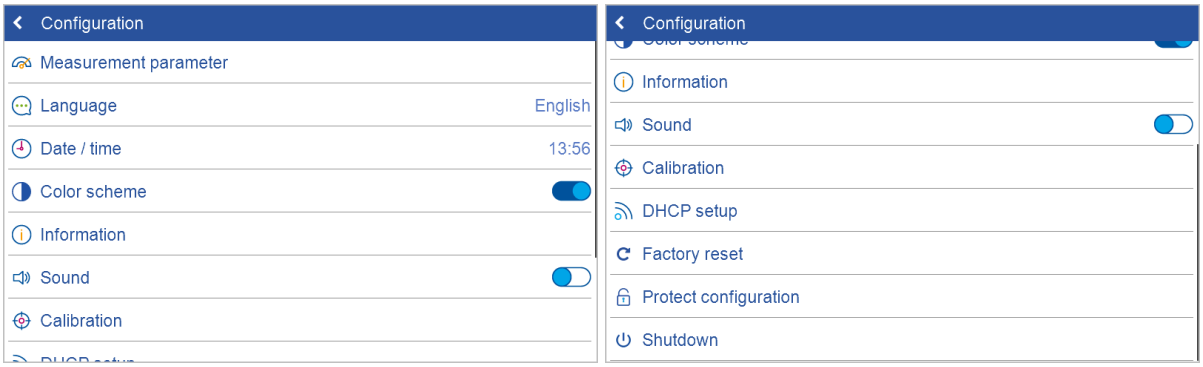
NOTICE

Standards (and organizers) received from smart-process can not be deleted on the instrument - use smart-process to delete these objects.

6

System Configuration

With this function you can configure the instrument according to your needs.

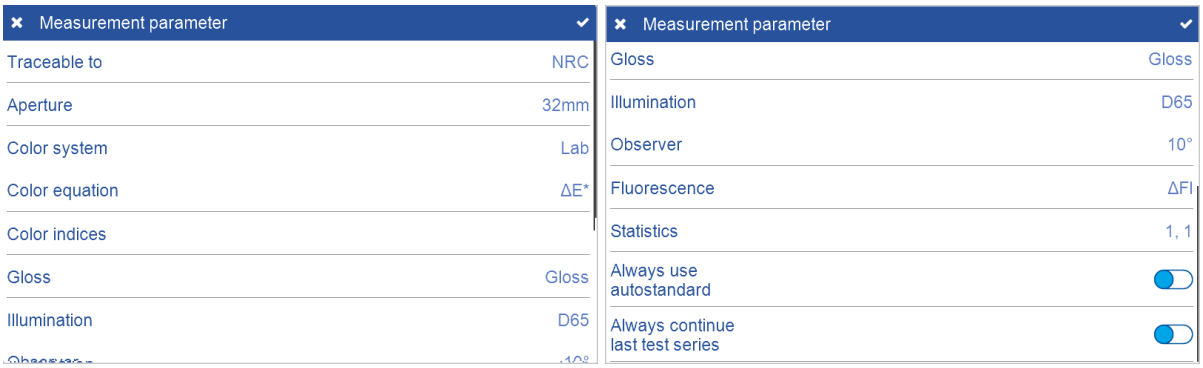


The configuration menu comprises following options:

- Measurement Parameter 55
- Language 71
- Date / Time 71
- Color Scheme 73
- Information 73
- Sound 74
- Calibration 74
- DHCP Setup 80
- Factory Reset 81
- Config Protect 81
- Shutdown 82

6.1 Measurement Parameter

The default values for the measurement parameter are as shown in System Operation 24 > Parameters 25.



Following measurement parameter can be set:

- Traceability 56
- Aperture 56
- Color System 60
- Color Equation 61
- Measurement Screen 62
- Color Indices 63
- Jetness 63
- Gloss 64
- Illumination 65
- Observer 66
- Fluorescence 66
- Statistics 67
- Autostandard 68
- Test Series 70

NOTICE

Save your settings with the check mark in the upper right corner. To leave a settings dialog without saving go back to the previous level with the back arrow icon in the upper left corner.

6.1.1 Traceability

Here the measurement mode of the instrument is selected. This has impact on the results retrieved during the measurements.

Following modes are supported:

- Traceable to **NRC**: The measurement results are in accordance with the calibration traceable to the National Research of Canada. In this mode, digital standards can be exchanged with instruments of spectro2guide family.
- Traceable to **color-view**: Select this mode if the measurement results should be compared to the color-view, the predecessor of the color2view.

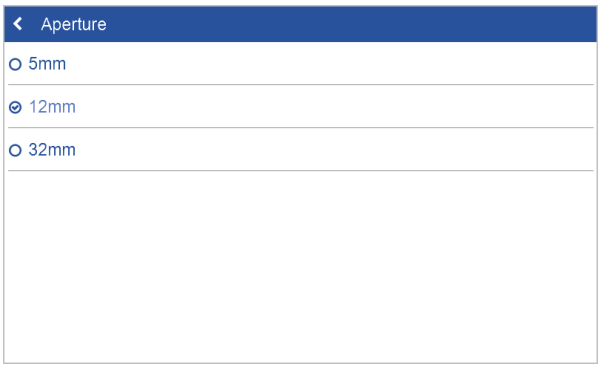
The measurement mode currently selected is shown in the main menu, see Display Unit 24.

6.1.2 Aperture

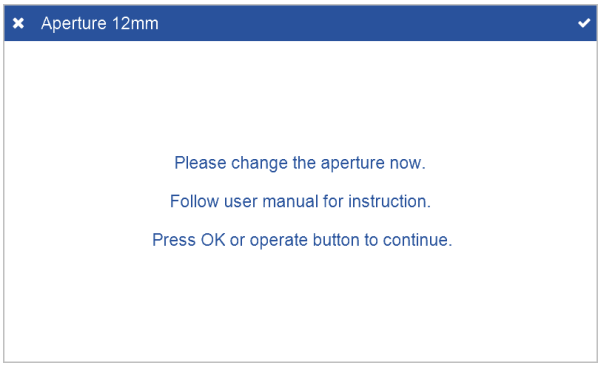
Select the measurement aperture to be installed on the instrument. Default is 32 mm:

- color2view (#7600) > 32 mm (standard)
- color2view Pro (#7610) > 32 mm (standard)
- color2view X (#7604) > 32 + 12 mm (standard + medium)
- color2view Pro X (#7605) > 32 + 12 + 5 mm (standard + medium + small)

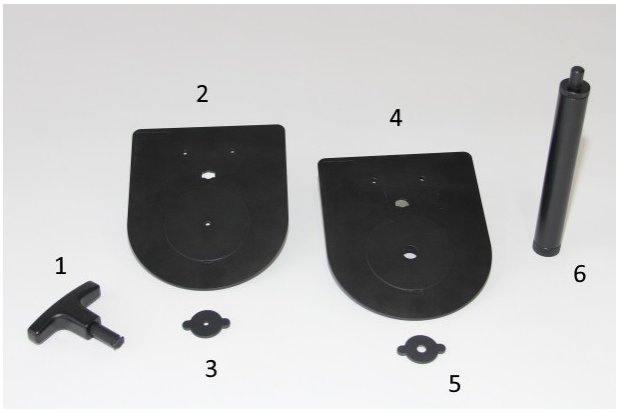
Select the required aperture and confirm with the check mark.



The shutter opens automatically. You can change the aperture on the instrument now.

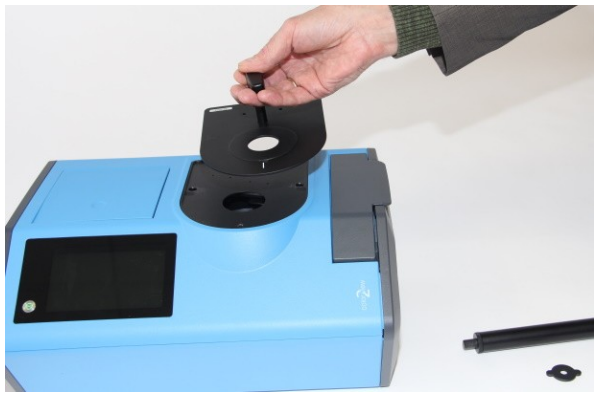


For the aperture exchange a specific accessory set is included.



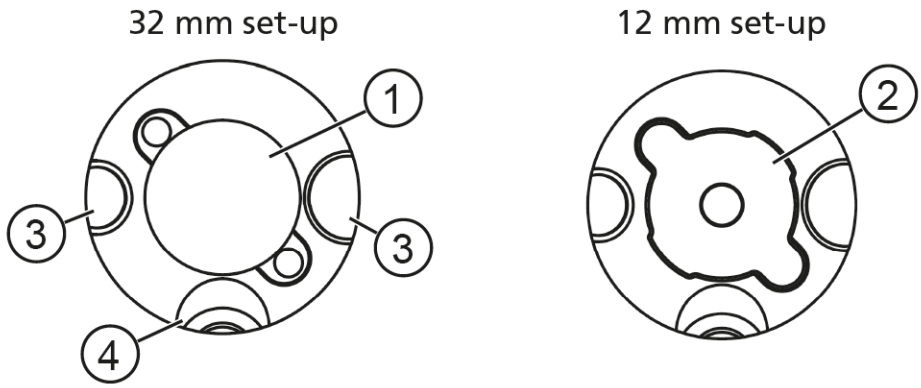
1. Plate Key
2. Aperture Plate - Small (5 mm)
3. Aperture for Illumination Adjustment - Small (5 mm)
4. Aperture Plate - Medium (12 mm)
5. Aperture for Illumination Adjustment - Medium (12 mm)
6. Magnetic Lifter

To exchange the aperture use the Plate Key **(1)** to remove the existing aperture plate.



Attach the Aperture for Illumination Adjustment (**3** or **5**) to the Magnetic Lifter **(6)** and insert lifter into aperture opening.

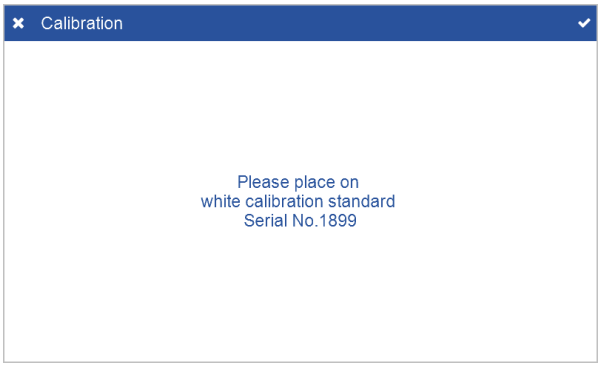
Place the lifter over the detector lens (32 mm) in the middle and press the button on the lifter's top to release the ring.



1	Dectector Lens 32 mm	2	Adjustment Ring 12 mm
3	20° Gloss Illumination	4	Camera/Sample Viewer Aperture

Once the ring is in the correct position, the corresponding exchangeable aperture plate can be attached (no tool required).

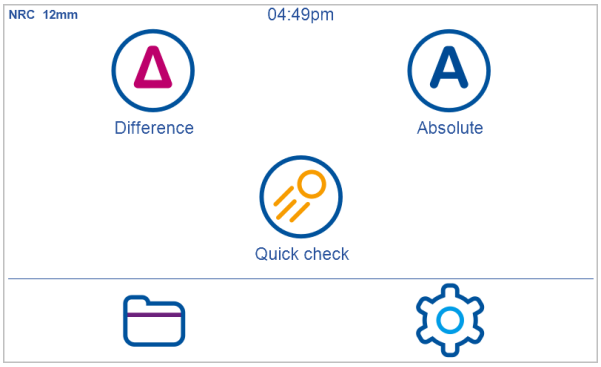
Confirm with the check mark in the upper right corner. The system requires a calibration now. Follow the instructions on the display.



If calibration procedure fails:

- Cancel calibration routine using "x" in the upper left corner.
- Back in the **Aperture** dialog select the desired aperture to restart again.
- The shutter opens automatically.
- Now check if aperture plate and adjustment ring fit to the selected aperture size.
- Correct the chosen combination and fit if necessary.
- Confirm and repeat the calibration procedure.
- If calibration procedure fails again, follow the instructions on the display.

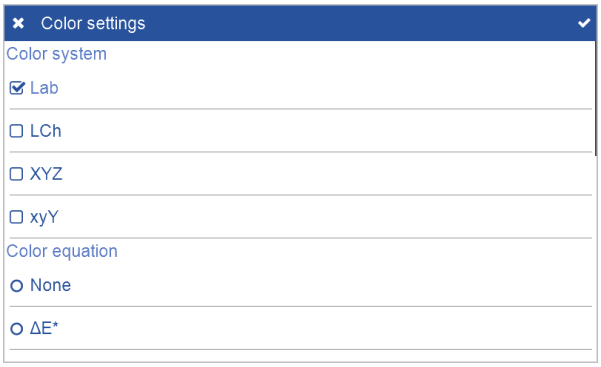
After successful calibration you can start measuring using the new aperture.



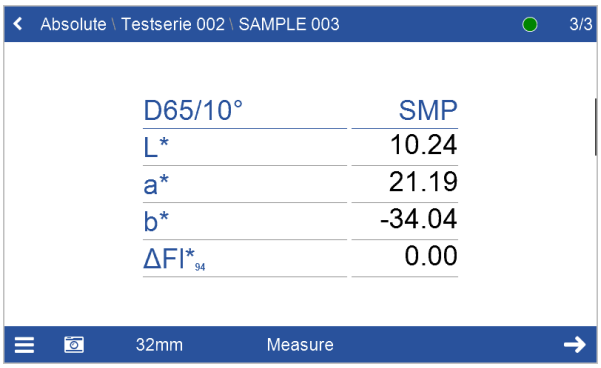
The current aperture selection is shown in the main menu (see Display Unit) 24 and in the measurement screen (see Measurement Aperture 29).

6.1.3 Color System

The instrument can measure multiple color indices and display the results. Go to **Measurement parameter** > **Color system** and select the color system(s) you want to use for measurements.



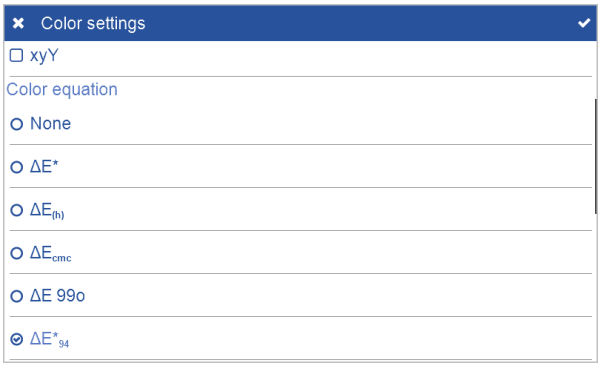
These color systems are visible in the measurements results.



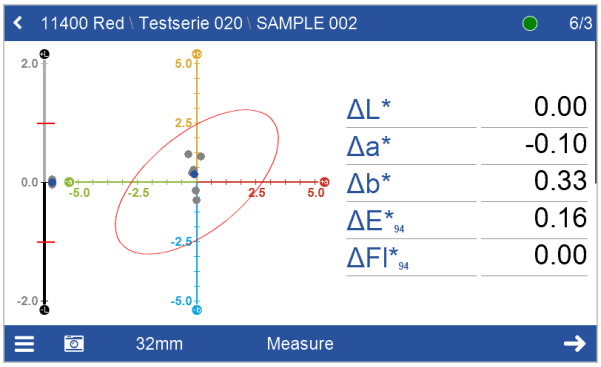
If the graph with the tolerances is shown, scroll down to see results in the first color system. Scroll more down to see the results in the next color system.

6.1.4 Color Equation

Go to **Measurement parameter** > **Color equation** and select the color equation you want to use for measurements.



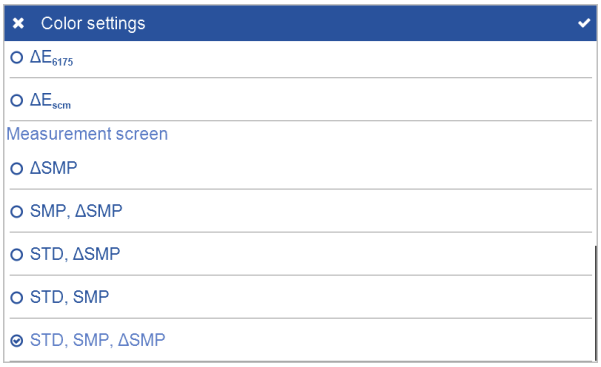
The selected color equation is visible in the measurements results.



If the graph with the tolerances is shown, scroll down to see data table and statistics.

6.1.5 Measurement Screen

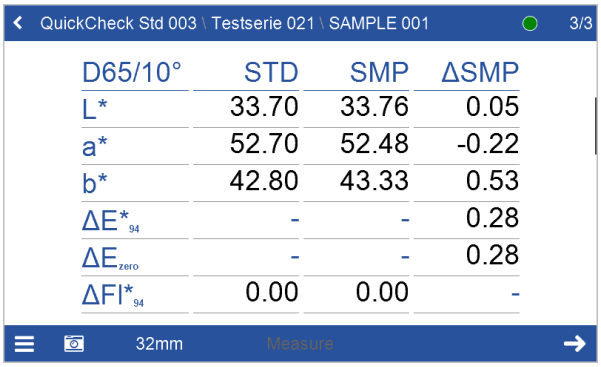
Go to **Measurement parameter** > **Color equation** and scroll down to **Measurement screen**. Select the data to be displayed in the measurement results.



Following data can be selected:

- STD = Standard
- SMP = Sample
- Δ = Difference (Delta) between Standard and Sample.

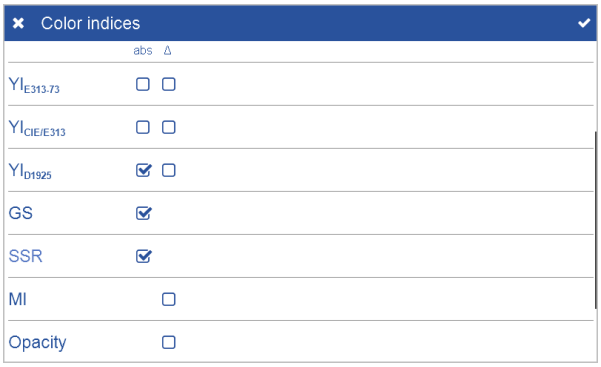
These data are visible in the measurements results.



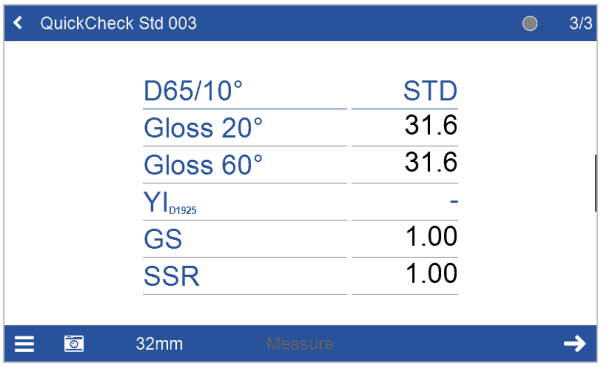
The default setting is **SMP, ΔSMP**. In the example shown above the value for **STD** is displayed too.

6.1.6 Color Indices

The instrument can measure multiple color indices and display the results. Go to **Measurement parameter** > **Color indices** and select color indices you want to use for measurements. You can decide to display absolute and / or difference values.



These color indices are visible in the measurements results.



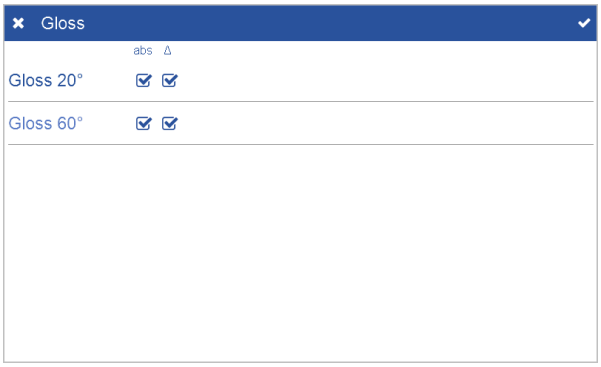
Another example can be found in Opacity Measurement 38 .

6.1.7 Jetness

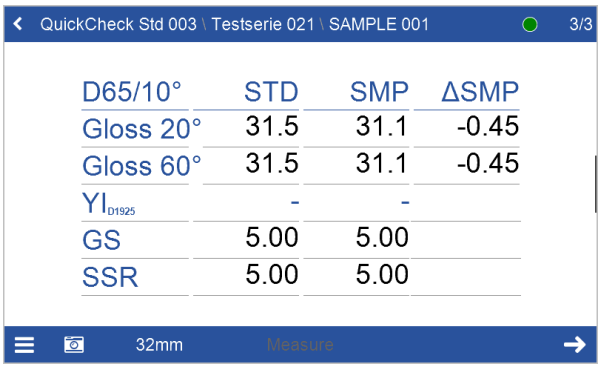
Details see Jetnesss Measurement 42 .

6.1.8 Gloss

The color2view can measure gloss under two different angles. Go to **Measurement parameter** > **Gloss** and select angles you want to use for measurements.



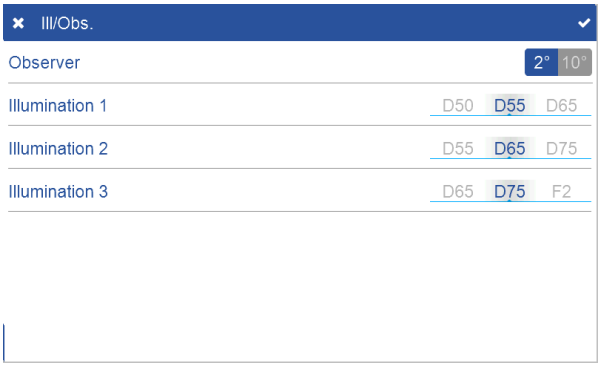
The selected gloss angles are visible in the measurements results.



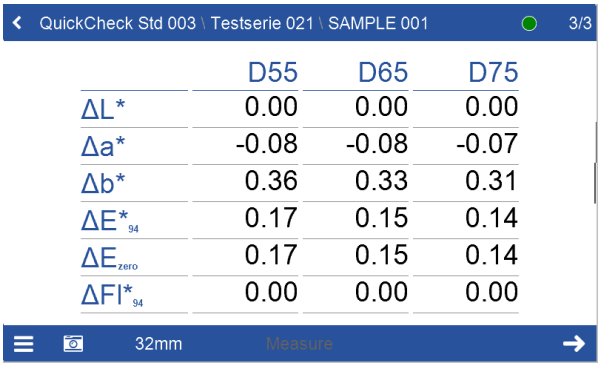
Use 20° for surfaces with medium gloss (10 to 70 Gloss Units) and 60° for surfaces with high gloss (more than 70 Gloss Units).

6.1.9 Illumination

The color2view can calculate the measurement results under up to three different standard illuminants. Go to **Measurement parameter** > **Illumination** and select the illuminations you want to get displayed.



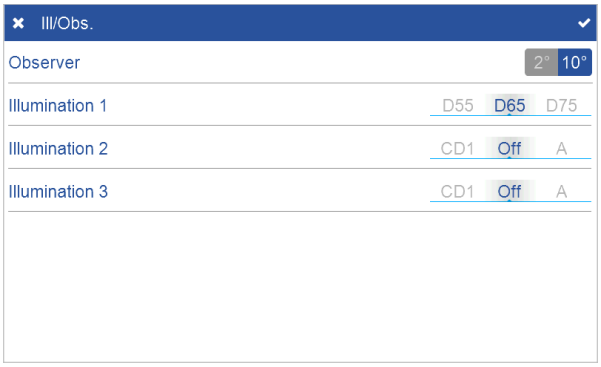
The selected standard illuminants are visible in the measurements results, scroll down to see the results for each illumination.



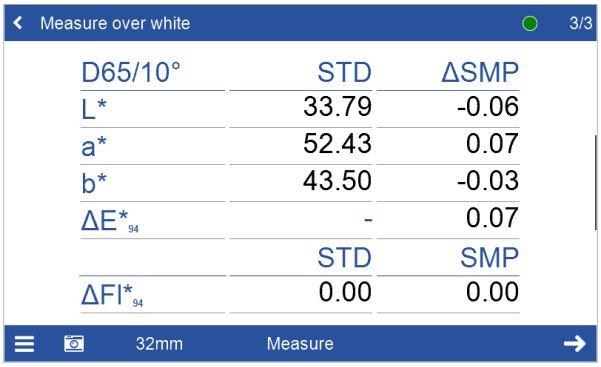
Three different illuminants are used to check if sample and standard show metamersim.

6.1.10 Observer

It is possible to choose between the 2° or 10° standard observer. Go to **Measurement parameter** > **Observer** and select the option you want to use for measurements.



The selected standard observer is visible in the measurements results - along with the Illumination 65. Scroll down to see the current value.



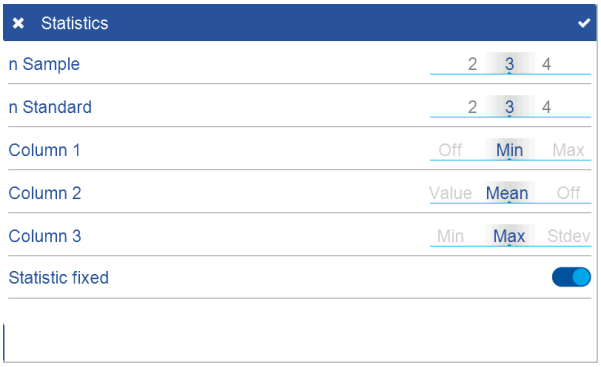
It is possible to choose between the 2° or 10° standard observer.

6.1.11 Fluorescence

Details see Fluorescence Measurement 41.

6.1.12 Statistics

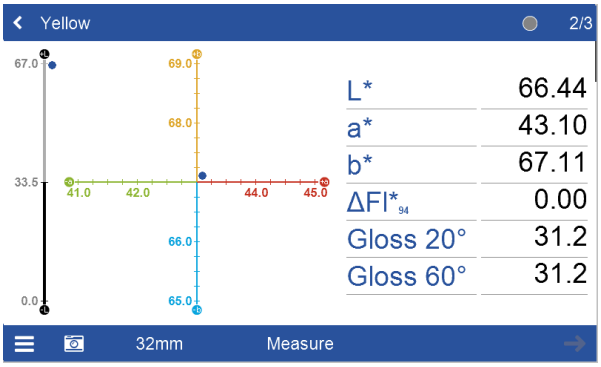
Go to **Measurement parameter** > **Statistics** and select the statistic options to be used during measurement: The number of measurements required on standard and on sample and statistic data to be displayed.



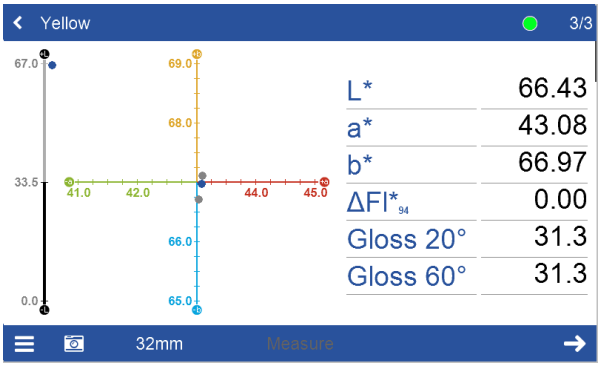
You can also select the statistic data to be displayed:

- Min: The minimum value for all measurements.
- Max: The maximum value for all measurements.
- Mean: The average value for all measurements.

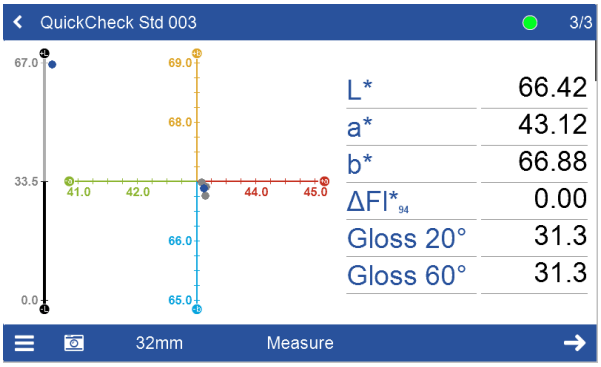
The number of measurements required is visible in the measurements results in the upper right of the screen, e.g. “2/3” means: 3 measurements are required and 2 measurements are already done. The status indicator remains gray for "not complete".



If the no. of measurements is e.g. “3”, the icon for **Next** becomes active after the 3rd measurement. The status indicator lights up in green for "complete".



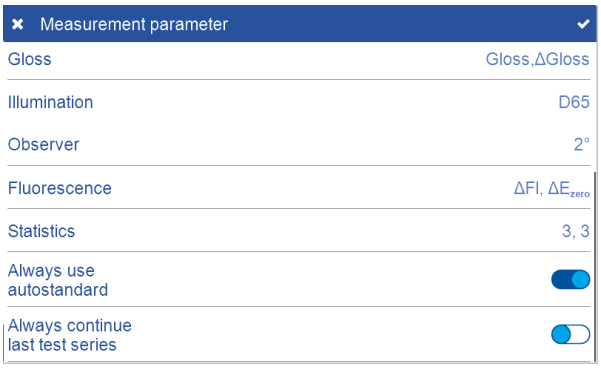
The option **Statistic fixed** means: The exact no. of measurements is to be made. It is not possible to make more measurements than defined.



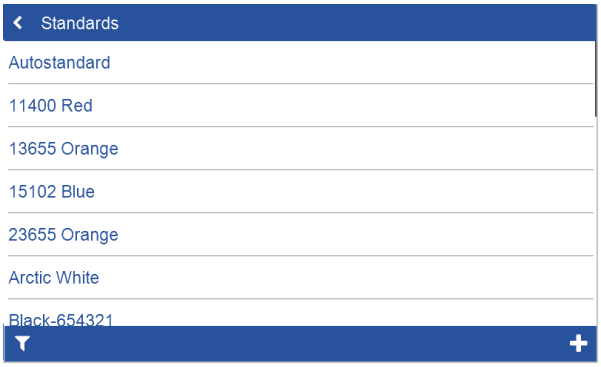
If this options is inactive, the minimum no. is required, but additional measurements can be made - both **Measure** and **Next** are active.

6.1.13 Autostandard

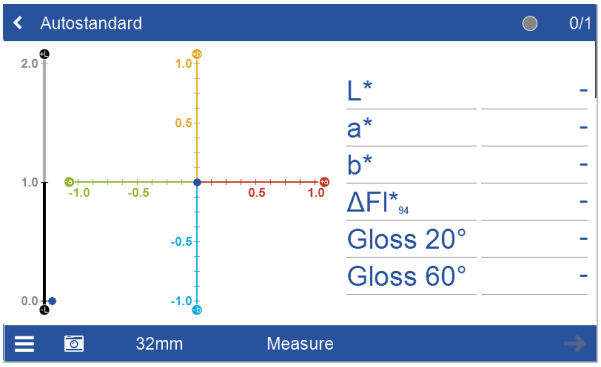
The option **Always use autostandard** is a comfort function.



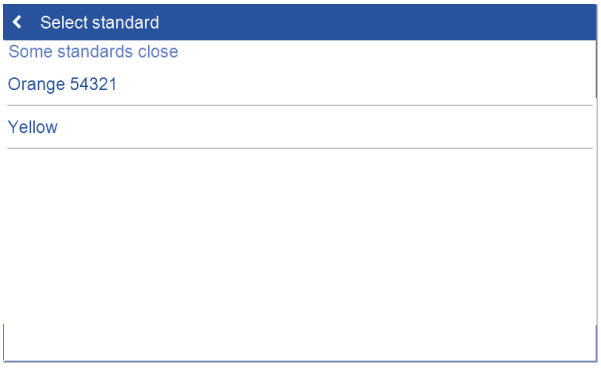
If the option is inactive, the **Standards** dialog displayed when starting the **Difference** mode.



If the option is active, the search for the nearest standard is always active, the measurement screen is displayed immediately.



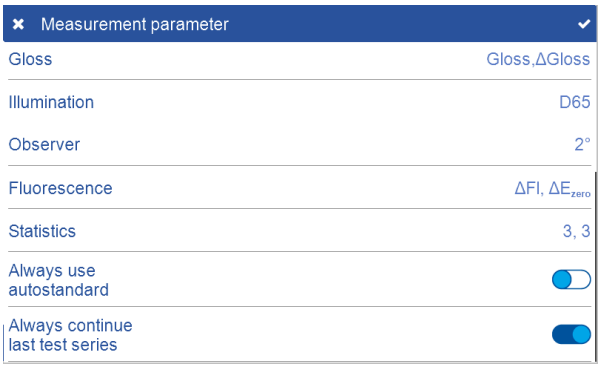
Place the instrument on the sample and click on **Measure**, the sample is measured and the nearest standards in system memory will be displayed.



More details see Difference Measurement 31 > Search for closest Standard 33.

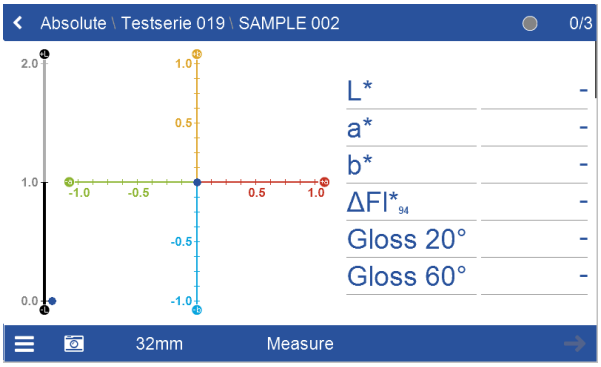
6.1.14 Test Series

The option **Always continue last test series** is a comfort function.



If the option is inactive, the **Select test series** dialog displayed when starting a measurement.

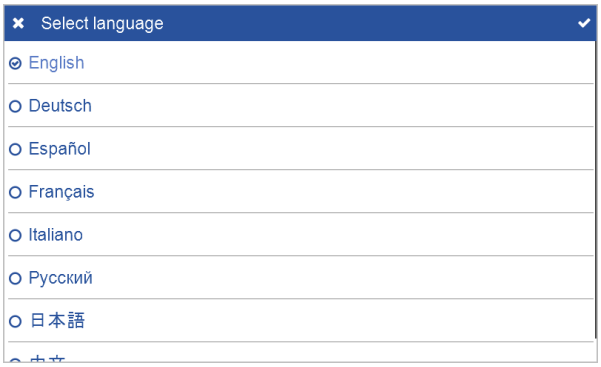
If the option is active, the latest series in the current measurement mode is opened automatically.



More details see Perform Measurements 31 > Context Menu 26.

6.2 Language

Select the language of the user interface.

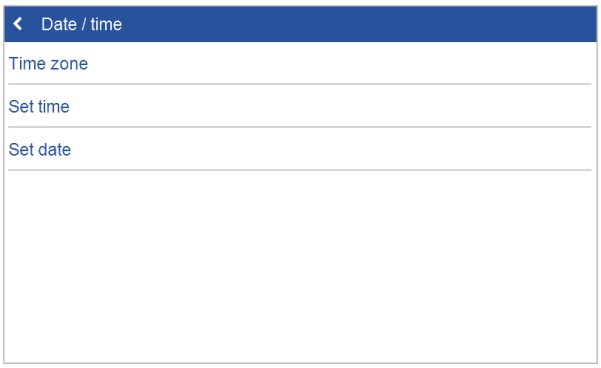


Following languages are supported:

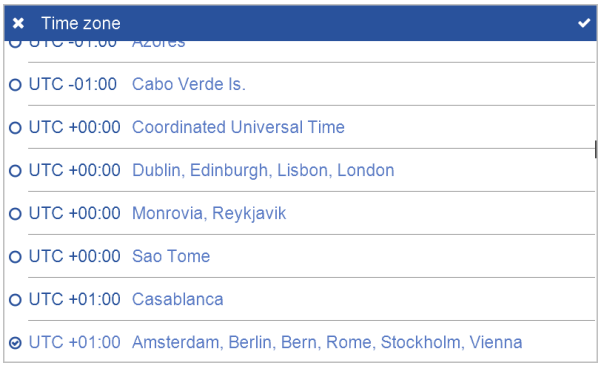
- English (English)
- Deutsch (German)
- Español (Spanish)
- Français (French)
- Русский (Russian)
- 日本語 (Japanese)
- 中国 (Chinese)

6.3 Date / Time

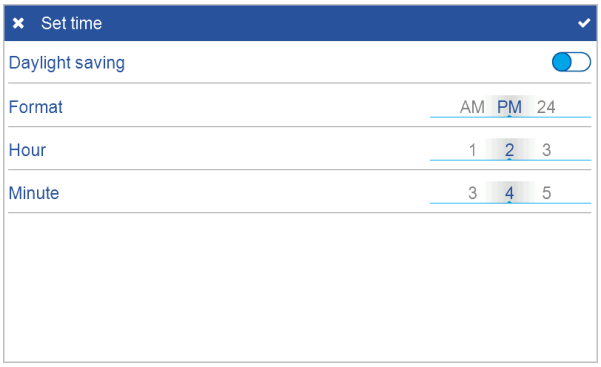
Here you can enter date, time and time zone for your current location.



The time zone is the difference of your location in hours compared to the Universal Time Code (UTC): London is UTC +00:00, Berlin is UTC +01:00 and so on.



The time can be entered in hours and minute, during summer time activate **Daylight saving**.



The date is entered with day, month and year.

For **Date** and **Time** the **Format** to be displayed can be selected.

6.4 Color Scheme

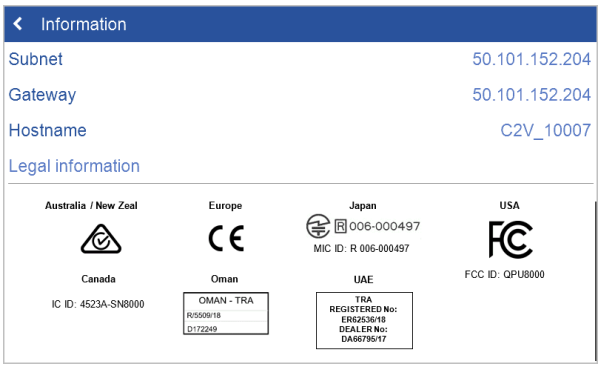
If this option is activated the white background of the display turns to red. This option is preferred in case of darker surroundings.

If this option is deactivated the background turns back to white.

6.5 Information

Under this option the details about instrument, firmware and certification can be retrieved.

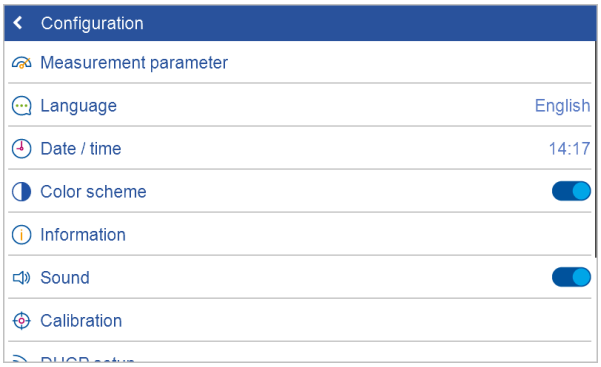
In the middle the network information is available. At the bottom the legal information is provided.



For the IP details see DHCP Setup 80 .

6.6 Sound

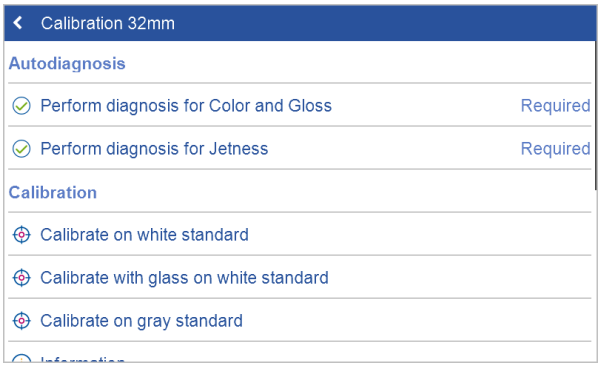
If this option is activated the internal speaker is used to indicate the measurement progress.



If this option is deactivated the measurements take place in silent mode.

6.7 Calibration

The system delivery comprises test and calibration standards, see Calibration and Test Standards 21 . Test tiles are used for autodiagnosis to check whether the color2view needs to be calibrated. Standard tiles are used to calibrate the instrument. Each standard tile comes with a dedicated serial number matching your instrument. In the configuration menu select **Calibration**.



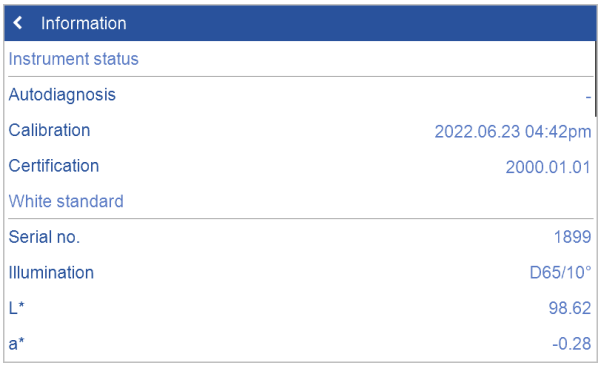
The instrument calibration comprises following functions:

- Calibration Information 75
- Diagnosis Color / Gloss 75
- Diagnosis for Jetness 76
- Calibration on White 77
- Calibration with Glass 78
- Calibration on Gray 78
- Saving Standards 79

When using these tiles take care for correct alignment of instrument.

6.7.1 Calibration Information

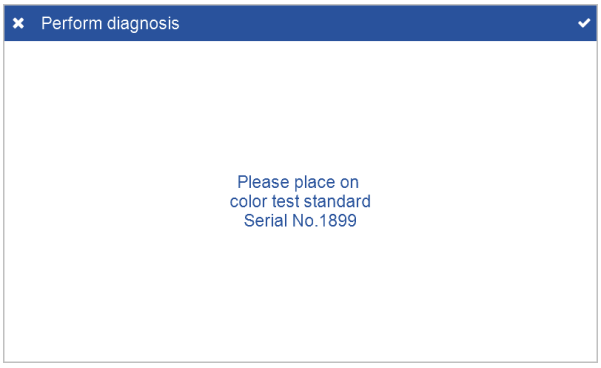
Use the information screen to check the current status of diagnosis and calibration.



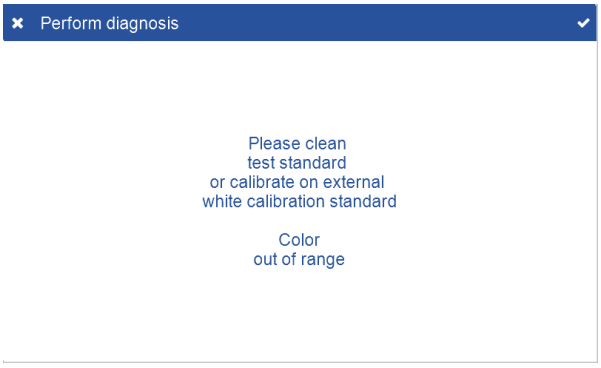
The screen shows the details for instrument status and for calibration and test standards.

6.7.2 Diagnosis Color / Gloss

After 28 days autodiagnosis is requested. Use the **green color test standard** and **black gloss test standard** for this check. Click on **Perform diagnosis for Color and Gloss**. The instrument will guide you through the diagnosis procedure.



If the diagnosis passes, you can use the instruments to measure. If the diagnosis fails, following message appears: “Please clean test standard or calibrate on external **white** calibration standard”.

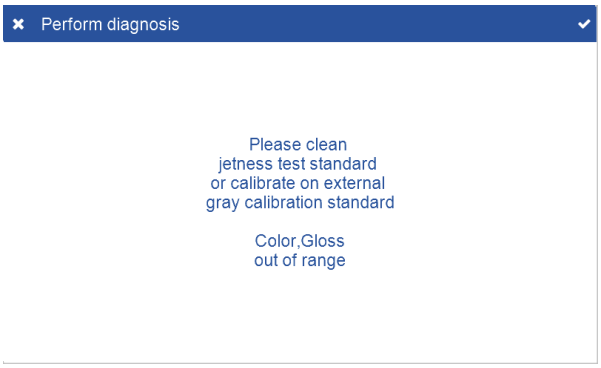


Clean the test standard and repeat. If diagnosis still fails, calibrate the instrument on the **white** standard, see Calibration on White 77 .

6.7.3 Diagnosis for Jetness

The "Pro" models can also measure jetness. In regular intervals a diagnosis is requested. Use the **deep black standard** for this check. Click on **Perform diagnosis for Jetness**. The instrument will guide you through the diagnosis procedure.

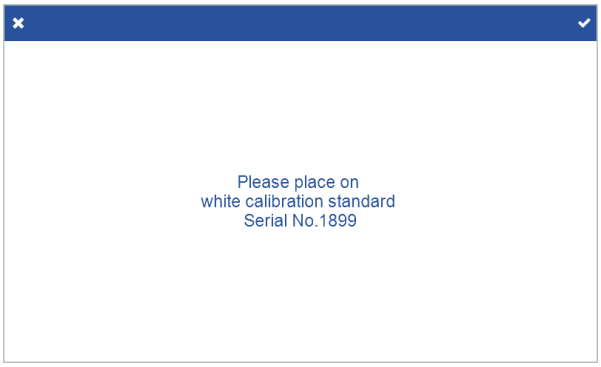
If the diagnosis passes, you can use the instruments to measure. If the diagnosis fails, following message appears: “Please clean **jetness** test standard or calibrate on external **gray** calibration standard”.



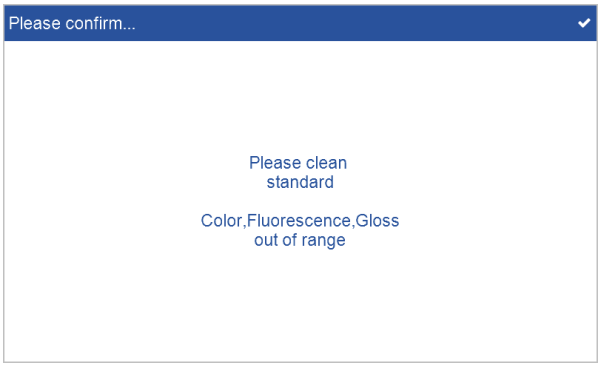
Clean the test standard and repeat. If diagnosis still fails, calibrate the instrument on the **gray** standard, see Calibration on Gray 78 .

6.7.4 Calibration on White

Calibration on **white** is required if the diagnosis for **color** or **gloss** fails. Click on **Calibrate on white standard**. The instrument will guide you through the calibration procedure.



If the calibration passes, repeat the diagnosis, see Diagnosis Color / Gloss 75 . If the calibration fails, following message appears: “Please clean standard / Color, Fluorescence, Gloss out of range”.



Clean the standards and repeat. If calibration still fails, contact the BYK-Gardner service team.

NOTICE

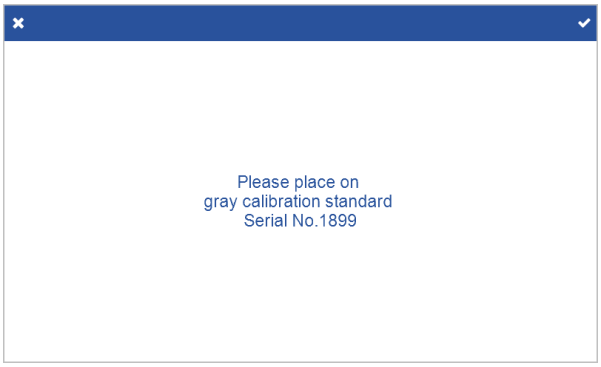
Perform calibration only, if required in order to ensure correct status of your calibration standard.

6.7.5 Calibration with Glass

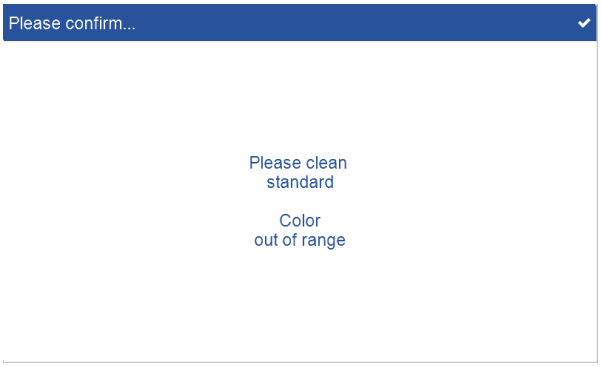
Calibration with glass on white is required when the color2view is used together with the "Granules Measurement Kit[45] " (#7607) or the "Automatic Sample Rotator[46] " (#7603) to minimize the influence of the bottom of the cuvette or cup on the measurement results.

6.7.6 Calibration on Gray

Calibration on **gray** is required if the diagnosis for **jetness** fails. Click on **Calibrate on white standard**. The instrument will guide you through the calibration procedure.



If the calibration passes, repeat the diagnosis, see Diagnosis for Jetness[76] . If the calibration fails, following message appears: “Please clean standard / Color out of range”.



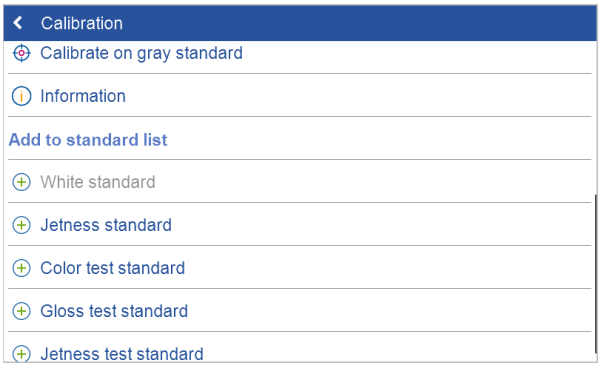
Clean the standard and repeat. If calibration still fails, contact the BYK-Gardner service team.

NOTICE

Perform calibration only, if required in order to ensure correct status of your calibration standard.

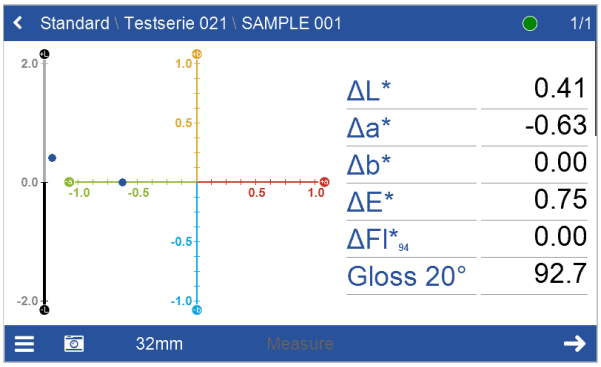
6.7.7 Saving Standards

In order to document the correct measurement status of your instrument you can save the test standards in the system memory. Select the option **Add standard to list**.



The standard is added to the list of standards in the instrument memory.

Use Difference Measurement[31] > Load existing Standard[31] to frequently monitor instrument performance. If the differences are within your tolerances you can continue to measure with your instrument. Otherwise calibrate your instrument.



The option **Add to standard list** will be inactive next time when this standard has already been added to the instrument memory. To delete the item from the memory use the function Browse Measurements[49] > Delete Standard[52] .

NOTICE

Every difference measurement is stored in the instrument. Transfer the measurement data to “smart-chart” to document each test case.

6.8 DHCP Setup

The instrument is equipped with a network adapter to connect to a local Area Network (LAN). You can use the LAN connection alternatively to the USB connection to transfer data between instrument and computer. Select **DHCP setup** and activate or deactivate the option **DHCP Off / On**.

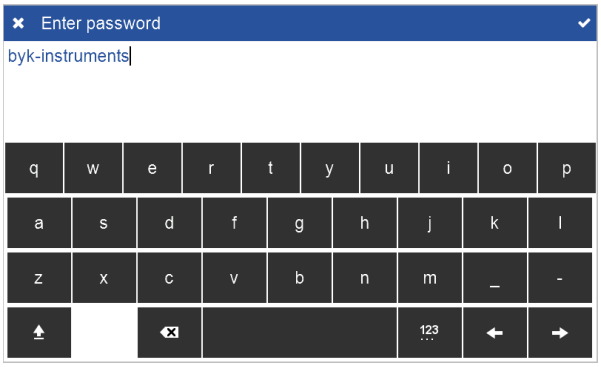
If DHCP is active, the IP address will be be automatically retrieved from the Domain Name Server (DNS). If DHCP is inactive, you can enter the IP details required for the LAN connection manually. Click a line to enter the corresponding data.

See Information 73 to check the network details / connection.

6.9 Factory Reset

If you are having technical problems with your instrument, you can perform a fallback to the factory settings. In the configuration menu select **Factory reset**.

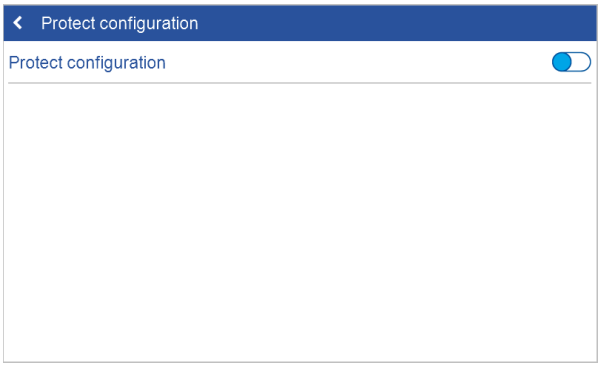
Confirm the security message to perform the fallback. You have to enter a password - details see Technical Data 87 > General Data 88.



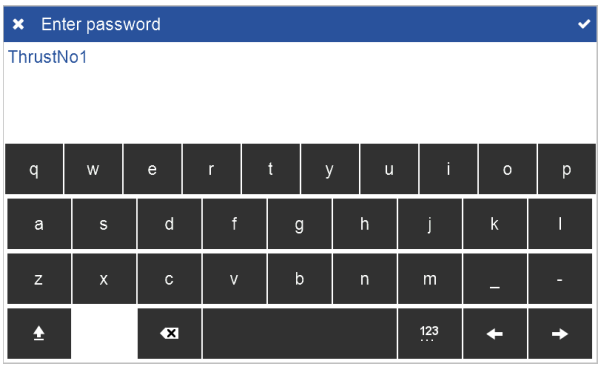
After fallback all your personal configuration and measurement data in the device will be lost. The instrument is set back to original state.

6.10 Config Protect

You can protect the current configuration of your instrument via password against accidental or intentional changes. In the configuration menu select **Protect configuration**.



Activate the option. You have to enter a password. The password is shown in clear text during input. There is no 2nd confirmation input of password required.



If the option is activated the configuration menu can only be accessed from the main menu by entering the password.

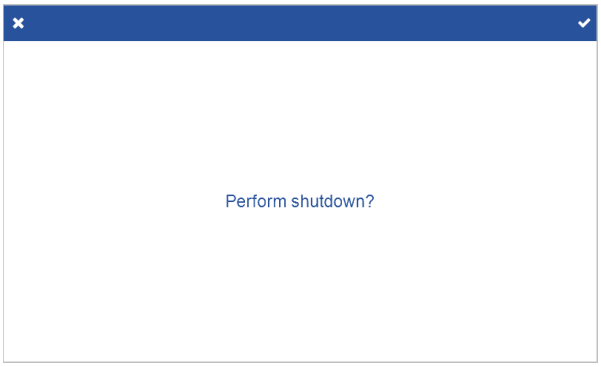
To remove the password, deactivate the option **Protect configuration**. This will delete the password from instrument memory. After reactivation to enter a new password.

NOTICE

Store the password on a secure place. If you do not remember, you will have to contact your local BYK-Gardner certified service center to get the master password.

6.11 Shutdown

If the instrument is not used or before removing the power supply the instrument is to be switched off Select the option **Shutdown**.



The instrument switches off after confirmation. Now the external power supply can be disconnected, if required.

CAUTION!

In order to save the data in the system memory do not switch of the instrument before the shutdown has finished.

7
Appendix

7.1 Abbreviations

The following abbreviations are used in this documentation.

CV	color-view
C2V	color2view
GU	Gloss Units
LAN	Local Area Network
LED	Light Emitting Diode
NIC	Network Interface Card
NRC	National Research of Canada
PC	Personal Computer
USB	Universal Serial Bus
UTC	Universal Time Code
UV	Ultra Violett
WLAN	Wireless Local Area Network

7.2 Cleaning

7.2.1 Cleaning the Instrument

Before cleaning, the instrument and accessories must be disconnected from the power supply as described in the safety instructions.

Do not insert any objects into the measurement aperture for cleaning. The instrument could get damaged - affecting a proper and safe operation.

Do not use any acetone! The instrument housing is resistant to a number of solvents, but cannot be guaranteed to withstand all chemicals. You should therefore use a soft, moist cloth for cleaning. For cleaning excessive dirt, use propanol.

A cleaning mat to clean the unit's wheels is situated on top of the reference tile's cover. Therefore, roll the wheels several times over the mat and then over a clean sheet of paper.

Dirt will stick to the mat and can be removed with clear water.

7.2.2 Cleaning Standards (All Models)

Since the surfaces of the standards are highly sensitive, cleaning must be undertaken with great care. Make sure to observe the following rules.

CAUTION: Do not use any acetone!

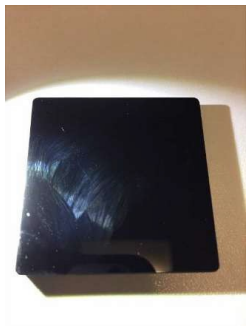
- To clean standards, use a new lint-free cloth, dust-free lens paper or an optical cloth.
- Apply only slight pressure as you clean and make certain there are no large particles stuck in the cloth that could damage the surface.
- For dirt that is difficult to remove, use an optical cloth dipped in propanol.Then wipe the surface with a dry optical cloth.
- It is highly recommended to handle the standards with great care. They should always be stored enclosed.
- Exact calibration is not possible unless the standard is in perfect condition. If the condition of the standard seems doubtful because of its appearance or measurement errors, we will be happy to check it for you.

7.2.3 Cleaning Jetness Standards (Pro Models)

The accuracy of the Jetnesss Measurement 42 (Pro models) can be significantly impacted by using dirty or damaged standards and samples. An LED flashlight is provided to check the cleanliness.

Use the flashlight on black samples and on the jetness standards:

- An angle of 0° ... 15° is good to detect dust on the surface.
- An angle of 75° ... 90° is good to detect streaks on the surface.



Since the surfaces of the standards are highly sensitive, cleaning must be undertaken with great care. Make sure to observe the following rules given in Cleaning Standards (All Models) 85 .

7.3 Technical Data

7.3.1 Color Measurement

Model	color2view	color2view X	color2view Pro	color2view Pro X
Measuring capability	Color, Gloss, Fluorescence		Color, Gloss, Fluorescence, Jetness	
Aperture size / Measurement spot	Ø 32 / 22 mm	Ø 32 / 22 mm Ø 12 / 08 mm	Ø 32 / 22 mm	Ø 32 / 22 mm Ø 12 / 08 mm Ø 05 / 04 mm **(*)**
Measurement geometry	45°c:0°			
Measurement range color	400 - 700 nm, 10 nm resolution			
Measurement range fluorescence	300 - 760 nm, 10 nm resolution			
Repeatability	0.01 ΔE94 (10 readings on white)			
Reproducibility	0.1 ΔE94 (average of 12 BCRA tiles)			
Color systems	CIELab/Ch, Lab (h), XYZ, Yxy			
Color differences	ΔE*, ΔE(h), ΔE94, ΔE99, ΔECMC, ΔE2000, ΔE2000PF			
Illuminants	A, C, D50, D55, D65, D75, F2, F6, F7, F8, F10, F11,UL30			
Color indices	YIE313, YID1925, WIE313, CIE, Berger, Color Strength, Opacity, Metamerism, Grayscale			
Fluorescent indices	ΔFl, ΔE_{zero}			
Observer	2°, 10°			

(*) Gloss measurement not possible / exchange of digital standards not possible

7.3.2 Jetness Measurement

Jetness indices	My, Mc, dM, Gy, Gc, dG
Repeatability	Y ≤ ± 0.0005 (for Y < 0.5)
Reproducibility	Y ≤ ± 0.003 (for Y < 0.5)

7.3.3 Gloss Measurement

20° Geometry

Aperture size	9 x 10 mm
Repeatability	Measurement range 0 - 100 GU: ± 0.2 GU
Reproducibility	Measurement range 0 - 100 GU: ± 1.0 GU

60° Geometry

Aperture size	9 x 16 mm
Repeatability	Measurement range 0 - 20 GU: ± 0.1 GU Measurement range 20 - 100 GU: ± 0.2 GU
Reproducibility	Measurement range 0 - 20 GU: ± 0.5 GU Measurement range 20 - 100 GU: ± 1.0 GU

GU = Gloss Unit

7.3.4 General Data

Temperature range	10°C to 40°C (50° to 104°F) for operation 0°C to 60°C (32°F to 140°F) for storage
Relative humidity	Up to 85% non-condensing at 35° C (95° F)
Operation altitude	Up to 2000 m (6561 ft)
Dimensions(LxWxH)	26 x 39 x 19 cm (10.2 x 15.35 x 7.5 in)
Weight	Approx. 7 kg (15.5 lbs)
Interface	USB Type B (USB 2.0) LAN (Fast Ethernet)
Memory	4.000 standards 10.000 samples
Languages	English, German, French, Italian, Spanish, Russian, Japanese, Chinese
Power supply	Input: 12 V ⎓, max. 2.5 A
External power supply	Input: 100 - 240 V ∿, 50 - 60 Hz, max. 1 A Output: 12 V ⎓, max. 3 A
Password for factory reset	byk-instruments

All technical data are subject to change without notice.

7.4 Troubleshooting

Message	Solution
Calibration invalid. Please perform calibration.	Perform calibration the external white calibration standard.
Measurement failed! Please repeat. Ambient light.	Appears if an error occurs during measurement. Make sure to completely cover measurement aperture. Make sure to hold the instrument stable during measurement. Repeat measurement.
Instrument temperature too high!	Instrument temperature is > 45°C. Allow the instrument to cool down.
Instrument temperature too low!	Instrument temperature is < 5°C. Allow the instrument to warm up.
Memory full! Please delete stored measurements.	Delete stored measurements.
Sample to bright! Please switch off M-indices …	Disable the jetness indices and repeat.
Gloss and temperature out of range.	Allow instrument to cool down and repeat.
Temperature out of range.	Allow instrument to cool down and repeat.
Gloss out of range.	Repeat measurement on a different spot.

7.5 Service Points

List of global service centers with ISO / IEC 17025 accredited laboratories		
Headquarter Germany c/o BYK-Gardner GmbH Lausitzer Strasse 8 82538 Geretsried / Germany	**Headquarter USA** c/o BYK-Gardner USA 9104 Guilford Road Columbia, MD 21046 / USA	**Headquarter PTE** c/o BYK USA dba Paul N. Gardner 316 N.E. First Street, Pompano Beach, FL 33060 - 6608 / USA
BYK-Gardner Service Point Austria, Hungary, Slovenia c/o Friedrich W. Bloch GmbH Wagramerstrasse 201 1210 Vienna / Austria	**BYK-Gardner Service Point France** c/o Eckart France S.A.S. 31 Rue Amilcar Cipriani 93400 Saint Ouen / France	**BYK-Gardner Service Point Spain** c/o Actega Artística S.A.U. Calle Balmes 8, Suite: 3º2ª 08291 Ripollet / Spain
BYK-Gardner Service Point China c/o BYK (Tongling) Co. Ltd. Shanghai Branch Block 6A, Building A, No 88 Hong Cao Road, Xuhui District, Shanghai 200233 / P.R. China	**BYK-Gardner Service Point India** c/o IMCD India Private Limited 1101-03, B-Wing, ONE BKC, Bandra Kurla Complex, Bandra East, Mumbai, MH. Pin.:400 051. India	**BYK-Gardner Service Point Japan** c/o Tetsutani Co. Ltd. Chuo-ku, Osaka Tokuicho 2-2-2 / Japan
BYK-Gardner Service Point South Latin America c/o MAST Comercial e Importadora LTDA Rua Itaporanga, 340-B, Bairro Paraiso, Santo André - SP, 09190-640 / Brazil		
Complete list: https://www.byk-instruments.com/global-service-centers List of authorized agents: https://www.byk-instruments.com/contact-infos		

Notes

A member of ALTANA

Download your manuals from:
https://www.byk-instruments.com/p/7600

Download your software from:
https://www.byk-instruments.com/software

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