BYK

micro-TRI-color

Type 345 000 015

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 VALUE-ADDED services:

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

BYK-Gardner is part of the Altana Group and a direct subsidiary of BYK, the worldwide leader of additives for coatings and plastics. Together we offer complete and unique solutions for you, our customer.

Thank you 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

www.byk-instruments.com

1.1 For Your Safety

⚠ CAUTION

Familiarization with safety instructions is 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

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.

1.2 Disclaimer

Exclusion of Liability

No claims of product liability or warranty can be honored if the device is not operated in accordance with the operating instructions.

1.3 Disposal

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

1.4 Copyright

Information on Copyright

Specific properties and structural characteristics of the instrument are intellectual property of BYK-Gardner. The copyright of this manual remains with BYK-Gardner.

This document must not be reproduced fully or in party, published or used for any other competitive purposes, no matter whether against payment or not, without prior written authorization from BYK-Gardner.

BYK-Gardner reserves the right to update the instrument, software and written documentation without prior notice.

1.5 Declarations

1.5.1 EU Declaration of Conformity

Hereby,

BYK Gardner GmbH
Lausitzer Strasse 8
D-82538 Geretsried

declares, that this instrument complies with the requirements of the following EU directives:

- 2014/30/EU - Electromagnetic Compatibility
- 2014/35/EU - Low Voltage
- 2014/53/EU - RED (R&TTE) Directive

The following harmonized standards were applied:

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

Geretsried, December 7, 2020

Frank R. Wagner
Managing Director

1.5.2 FCC Declaration (USA)

This equipment contains a radio module with FCC-ID:

- QPU8000 or
- 2ADHKATWINC1510.

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF exposure statement (portable devices)

This device complies with the RF exposure SAR test exclusion requirements for portable devices, if a minimum separation distance (2 cm) to the antenna is kept. If the device is used and held correctly, the distance to the antenna will be maintained and the risk of human contact during normal operation is minimized.

1.5.3 IC Declaration (Canada)

This equipment contains a radio module with IC-ID:

- 4523A-SN8000 or
- 20266-WINC1500PB.

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

This device complies with Industry Canada's license-exempt RSSs.

Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

1.5.4 Japanese Declaration

This equipment contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Japanese Radio Law. .

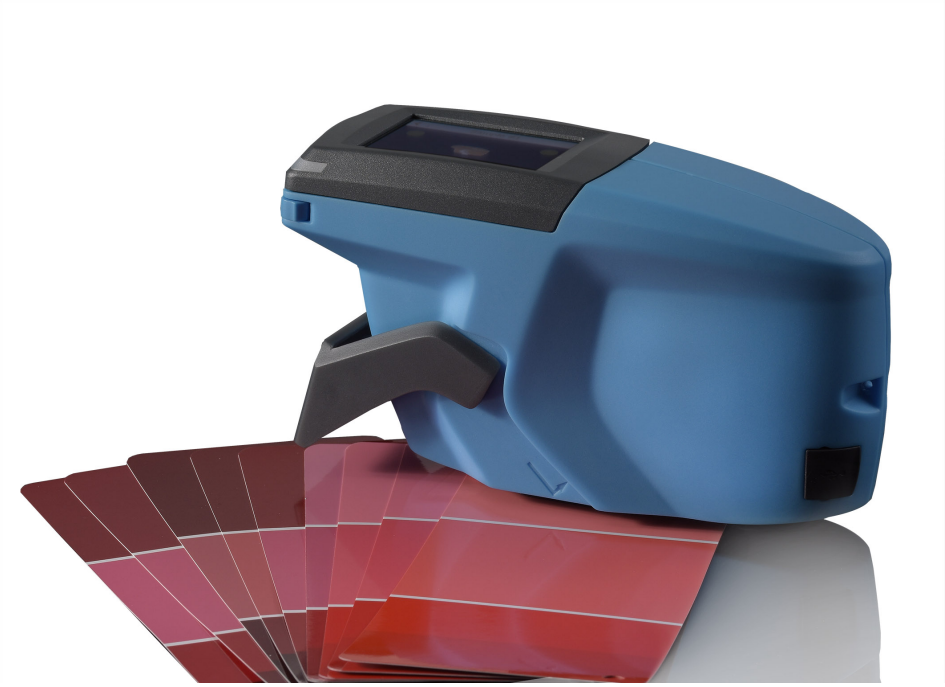
MIC ID: R 006-000497

MIC ID: R 204-A00009

1.6 Intended Use

The instrument is designed to measure color on different surfaces.

By placing the base plate of the unit onto a surface and pressing either the button **Operate** on the side of the instrument or triggering the measurement on the display, the instrument measures the surface and processes, displays and stores the measured values.



The instrument can be connected via USB or WiFi to a computer in order to read or write data.

It allows to download predefined worklists from a 3rd party software in order to organize the measurement process.

It stores the measured values in memory for upload to the respective software in order to search for the best matching color formulation.

A resistive display allows additional functionalities.

2 System Description

The micro-TRI-color is a portable, three angle spectrophotometer. It is operated by the button **Operate** and the touch screen display. The button **Operate** is used to switch on the instrument. On the touch screen display icons and functions can be selected directly.

2.1 Delivery Content

The items listed below are contained in the packaging:

1. Instrument with Docking Station [▶ 12]
2. Instrument without Docking Station [▶ 13]

Please contact BYK-Gardner if any item is missing or damaged.

2.1.1 Instrument with Docking Station

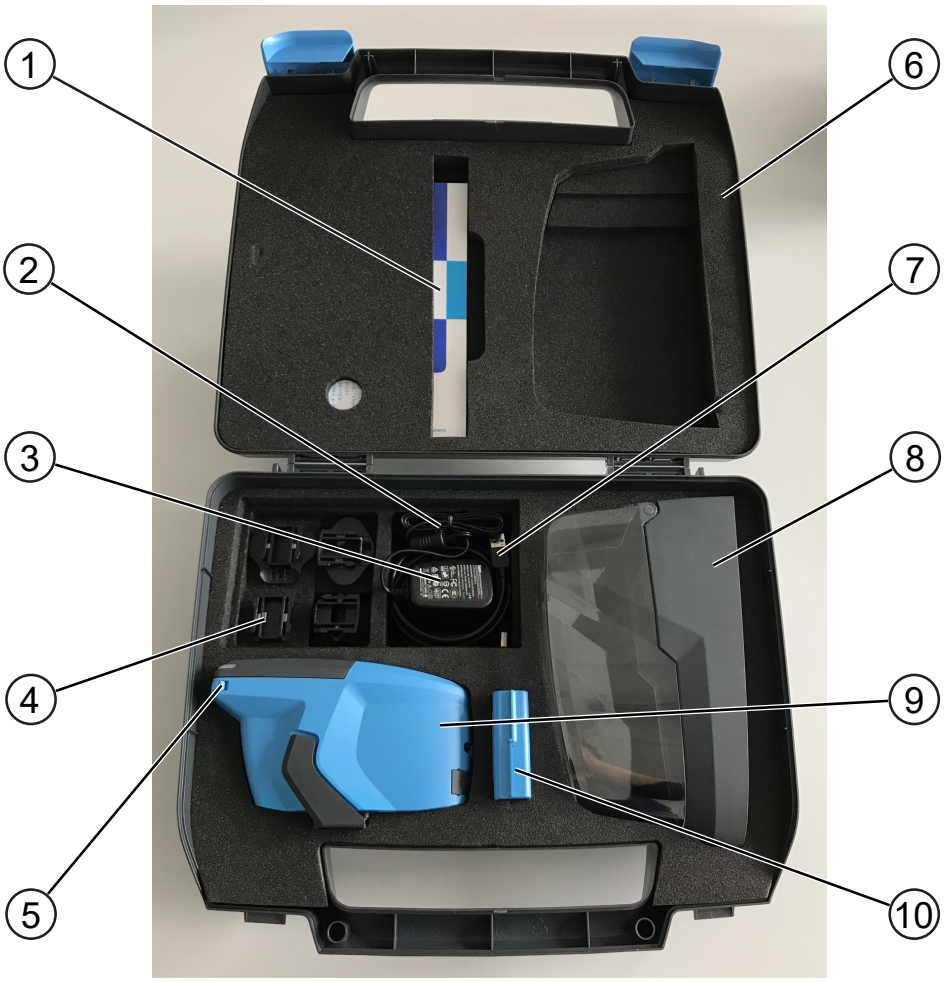


Illustration 1: Arrangement of parts in the case for instrument with docking station

1	Safety and short instructions	6	Instrument carrying case
2	Safety wrist strap	7	USB cables: Type A / B for docking station Type A / C for instrument
3	Power supply with proprietary plug for docking station	8	Docking station
4	Power supply plugs (US / JP, EU, UK, AU / CN)	9	Instrument
5	Stylus (inserted in instrument)	10	Combined white and green standard

2.1.2 Instrument without Docking Station

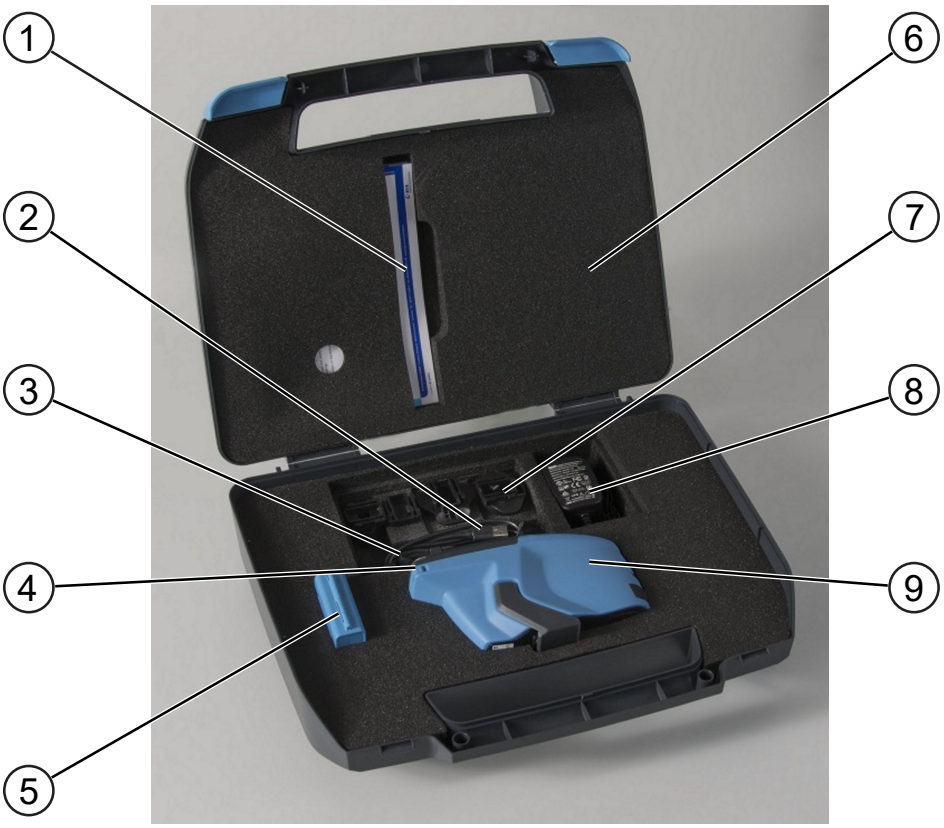


Illustration 2: Arrangement of parts in the case for instrument without docking station

1	Safety and short instructions	6	Instrument carrying case
2	USB cable type A / C	7	Plugs for power supply
3	Safety wrist strap	8	Power supply with USB C plug for instrument
4	Stylus (inserted in instrument)	9	Instrument
5	Combined white and green standard		

2.2 Names and Functions of Parts

2.2.1 Top View

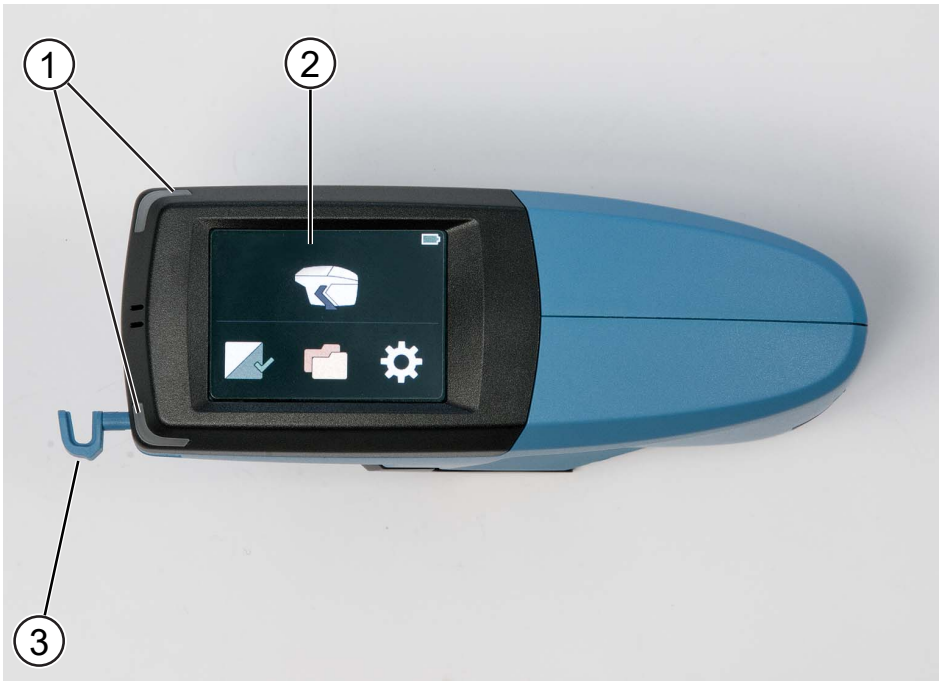


Illustration 3: Top view

1 Status-LEDs

Measure:

- Light up in blue during measurement.
- Light up in red in case of a measurement error.
- Light up in green if the measurement was successful.

Charge:

- Light up in red during charging.
- Light up in green when the instrument is fully charged.

2 Touch screen display:

Touch the icons on the screen with your finger or the stylus in order to operate the instrument.

3 Stylus:

Can be used for touching the icons on the screen.

2.2.2 Side View

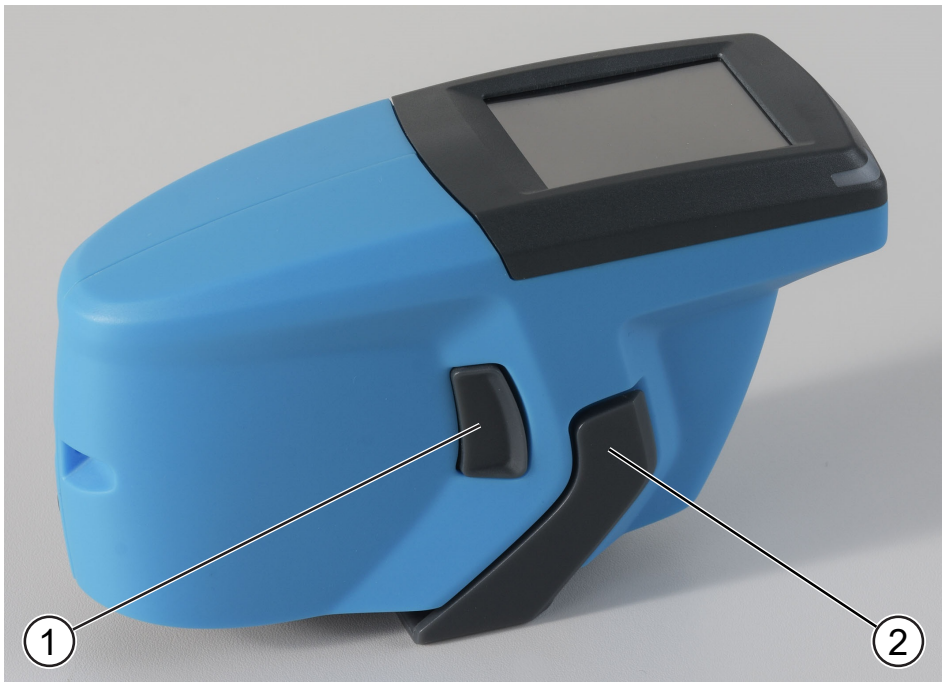


Illustration 4: Side view - right

1 Protective snap closure:

Protects the optics against foreign objects.

2 Button **Operate**:

- Turns the instrument on.
- Executes a measurement.

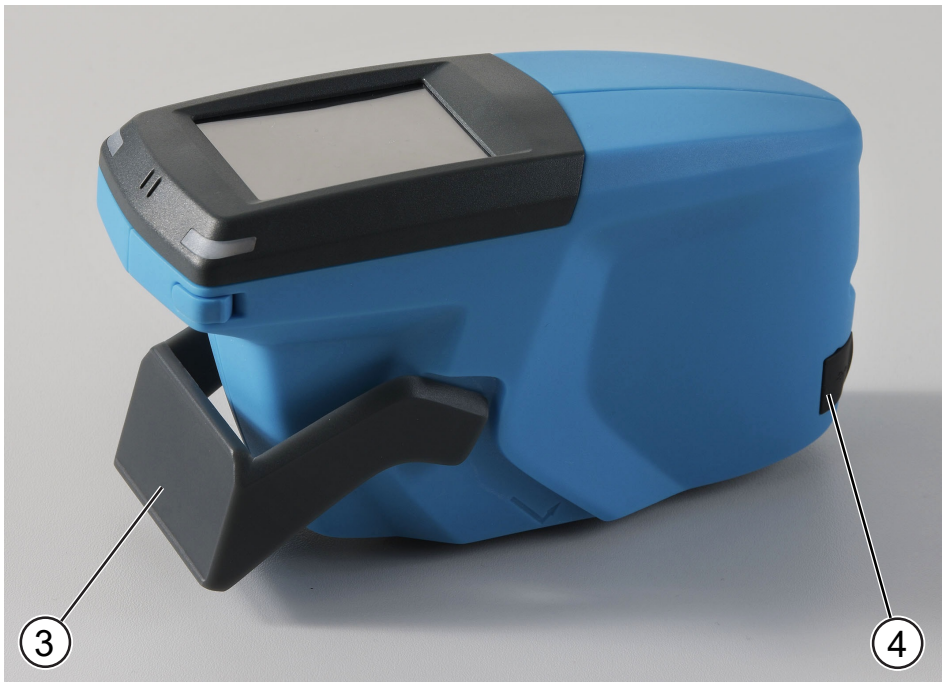


Illustration 5: Side view - left

3 Open protective snap closure.

4 USB type C plug:

- Is used for charging.
- Is used to transfer data between instrument and PC.

2.2.3 Bottom View

2.2.3.1 Instrument with Docking Station

Illustration 6: Bottom view – instrument with contacts for docking station

1	Contact pins for docking station	2	Protective snap closure

2.2.3.2 Instrument without Docking Station

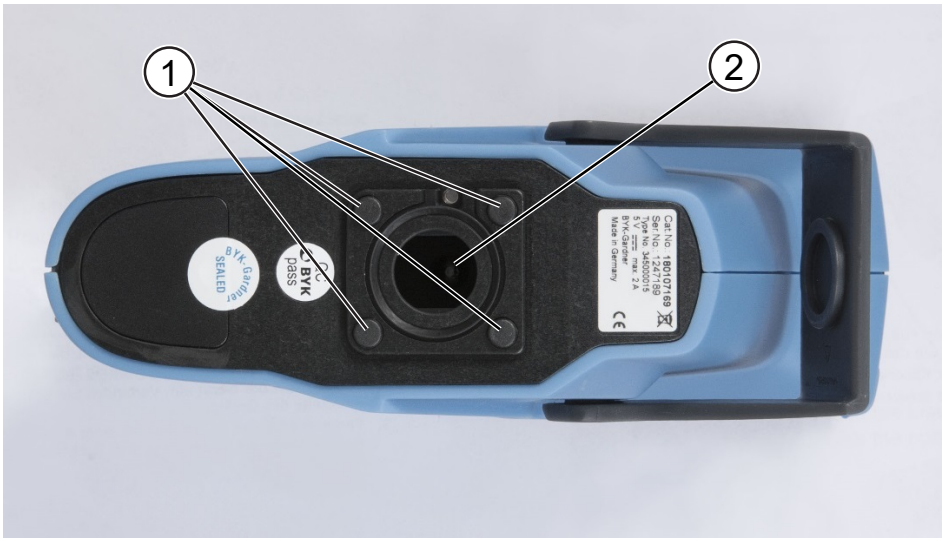


Illustration 7: Bottom view – instrument without docking station

1	Measurement pins: At least 3 of 4 have to be pressed to perform a measurement.	2	Measurement aperture

2.2.4 Power Supply

Illustration 8: Power plugs and supply

1 Power plugs: Can be clipped on the power supply.	2 Power supply: • USB C plug for instrument • Proprietary plug for docking station

2.2.5 Combined Standard

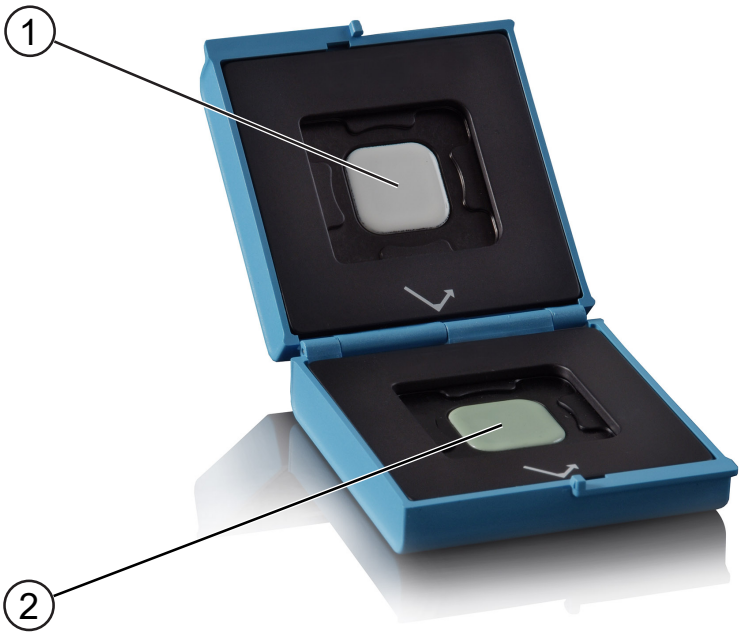


Illustration 9: Standards for calibration and check

1 White standard: Calibration	2 Green standard: Check

2.2.6 Safety Wrist Strap

The instruments provides a mounting option for the safety wrist strap. Use the hand strap as protection against dropping the instrument.

Illustration 10: Safety wrist strap

2.2.7 Docking Station

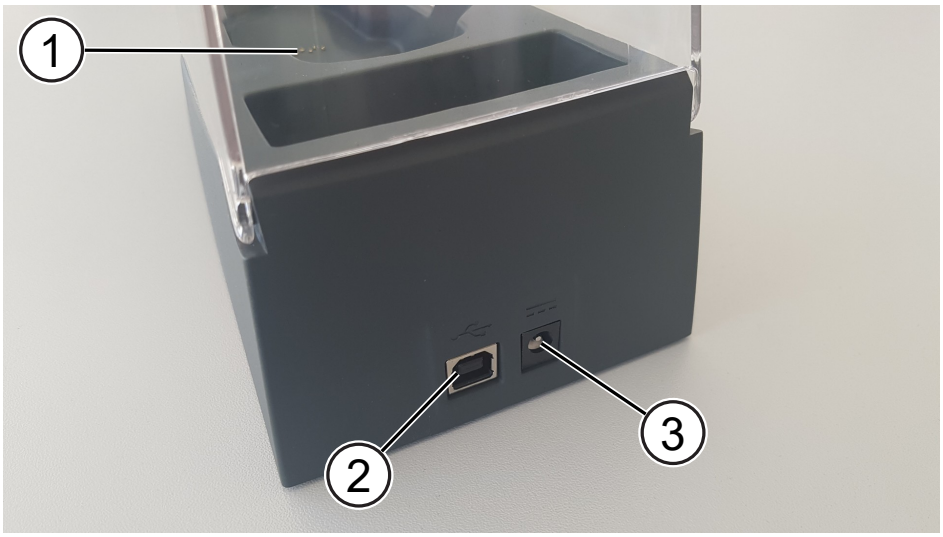


Illustration 11: Docking station

1 Contact pins for instrument	2 Socket for USB type A / B cable
3 Socket for power supply cable	

2.2.8 USB Docking Station Cable

This cable is used to connect the docking station with a PC for data exchange.

Illustration 12: USB cable type A / B for docking station

2.2.9 USB Interface Cable

This cable is used to connect the instrument with a PC for data exchange.

Illustration 13: USB cable type A / C for instrument

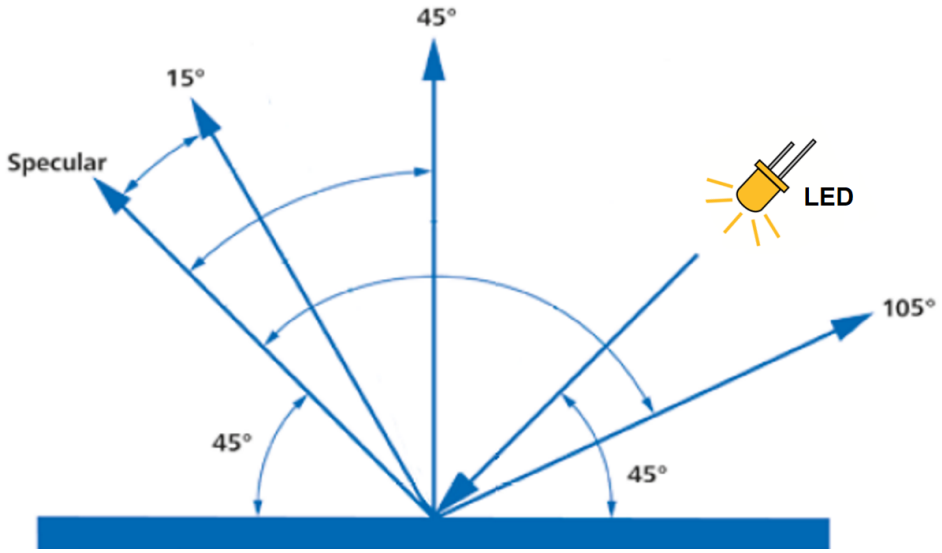
2.3 Measurement Principle

The micro-TRI-color illuminates the sample at an angle of 45° to the sample surface. The reflected light is detected at three different angles, calculated from the specular direction in the illumination plane.

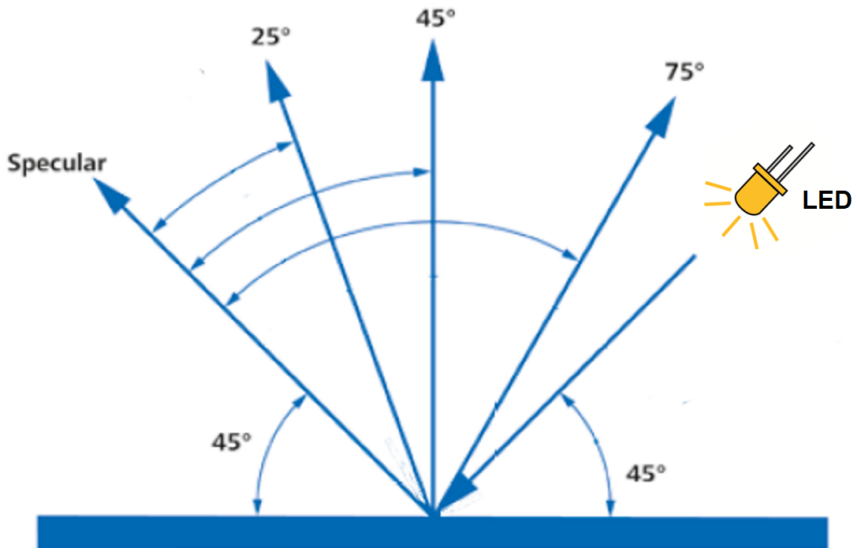
The instrument is available with following measurement angles:

- 15° - 45° - 105° or
- 25° - 45° - 75°.

2.3.1 Measurement Angles 15° - 45° - 105°



2.3.2 Measurement Angles 25° - 45° - 75°



3 Getting Started

The instrument comes ready to use and no major assembly activities are necessary. Please observe following notes.

- Charge the instrument fully before you put it in operation. Consult Charging the Instrument [▶ 21] for more information.
- Press the button **Operate** in order to turn the instrument on.
- Become familiar with the main menu for a quick navigation. Consult Main Menu [▶ 22] for more information.
- Press the displayed icons on the touch screen with your finger or the stylus in order to navigate through the menu and perform functions.
- Use the hand strap as protection against dropping the instrument.

3.1 Charging the Instrument

3.1.1 Charge via Power Supply

Connect the instrument with the power supply to the power supply grid.

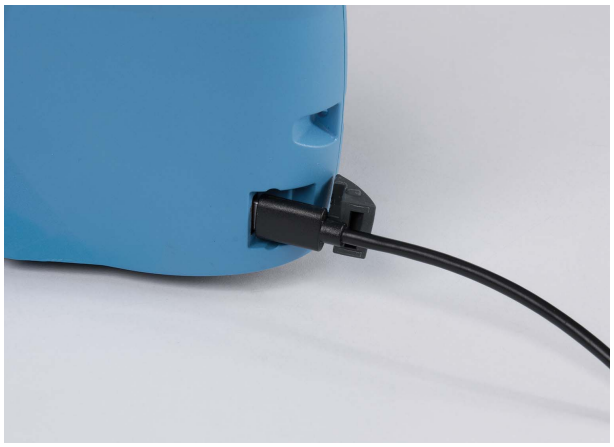


Illustration 14: Charging via USB cable

The LEDs on the instrument indicate the following states:

- Red: The instrument is charged.
- Green: Instrument is fully charged.

Disconnect the instrument from the power supply when the LEDs light up in green – it can be put in operation.

3.1.2 Charge via Docking Station

Connect the docking station with the power supply to the power supply grid. Put the instrument into the docking station.

Illustration 15: Charging via docking station

The charge LED on the docking station indicates the following states:

- Blue: Docking station is power supplied.
- Red: Docking station is charging the instrument.
- Green: Instrument is fully charged.

Keep the instrument in the docking station as long as the instrument is not in use.

3.2 Main Menu

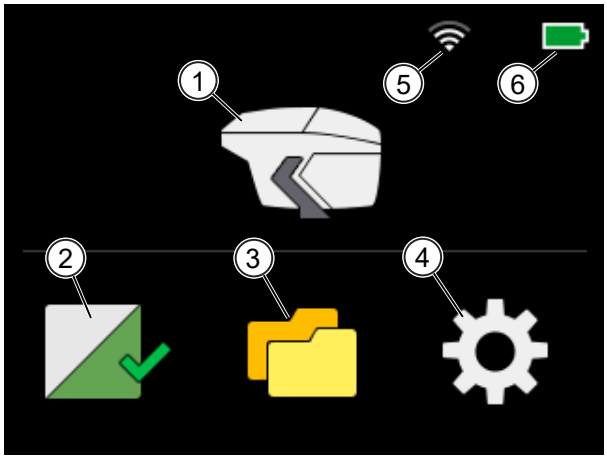


Illustration 16: Main menu of the instrument

1 Measure [▶ 27]: • You can perform measurements here.	4 Configuration [▶ 34]: • You can change settings or get instrument information here.
2 Calibration and Check [▶ 23]: • Shows status of white calibration. • You can perform calibration and color check here.	5 WiFi Connection [▶ 35]: • Indicates active WiFi connection and field strength.
3 Browse [▶ 32]: • You can view and delete measurement data here.	6 Battery Status [▶ 42]: • Shows current charge status of the Lithium battery.

4 Calibration and Check

In order to work properly, the instrument needs to be calibrated on a white standard and should be frequently monitored on a green checking standard:

- **White calibration:** Necessary every **30** days.
- **Green check:** Recommended every **7** days.

As long as the white calibration is valid, the instrument displays a green checkmark. The green checkmark is placed on the calibration icon in the main menu.

The instrument automatically indicates when white calibration is necessary. The indication is a red cross instead of a green checkmark.

See also

Get Calibration Information [▸ 42]

4.1 Perform White Calibration

A white calibration is necessary. This is indicated by a red cross, placed on the calibration icon in the main menu.

1. Open the snap closure.
2. Click on the calibration icon  in the main menu and place the instrument on the **white** tile as you see below.

Illustration 17: Instrument placed on white calibration tile

3. The screen below is displayed.

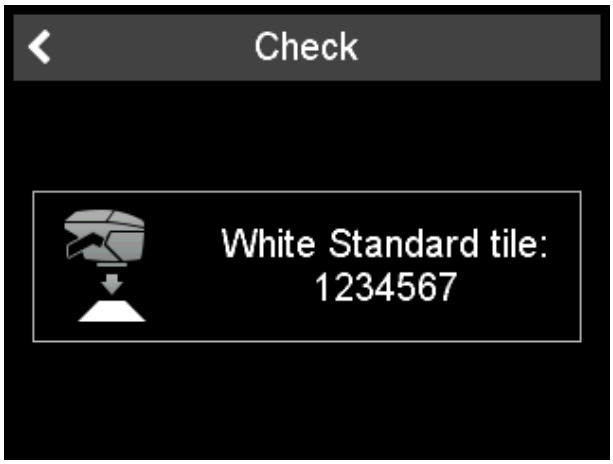


Illustration 18: Instrument to be placed on white calibration tile

4. Click on the instrument icon or press the button **Operate**.
5. White calibration is performed, first a color measurement is performed.

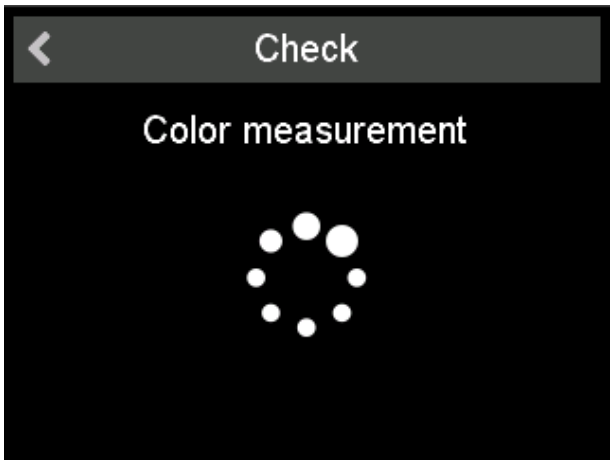


Illustration 19: White calibration – color measurement

6. The instrument asks you to Perform Green Check [▶ 24].
7. After successful green check click on the checkmark in the upper right corner.

The instrument is calibrated for the next 30 days.

4.2 Perform Green Check

A green check is recommended every 7 days. The indication of the green tile check interval is optional and depends on the specified firmware settings.

1. Open the snap closure.
2. Click on the calibration icon in the main menu and place the instrument on the green tile as you see below.

Illustration 20: Instrument placed on green checking tile

3. The screen below is displayed.

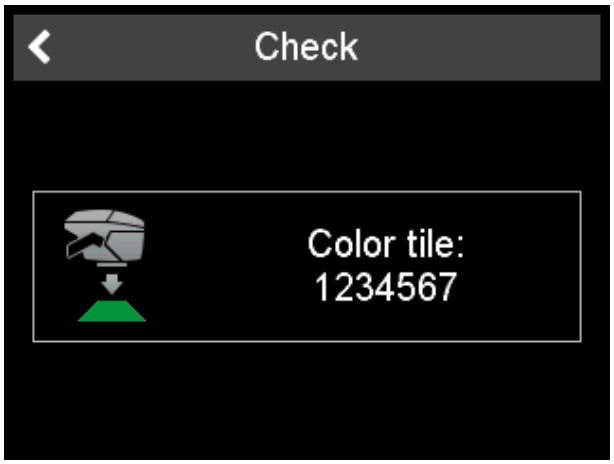


Illustration 21: Instrument to be placed on green checking tile

4. Click on the instrument icon or press the button **Operate**.
5. The color measurement is performed.

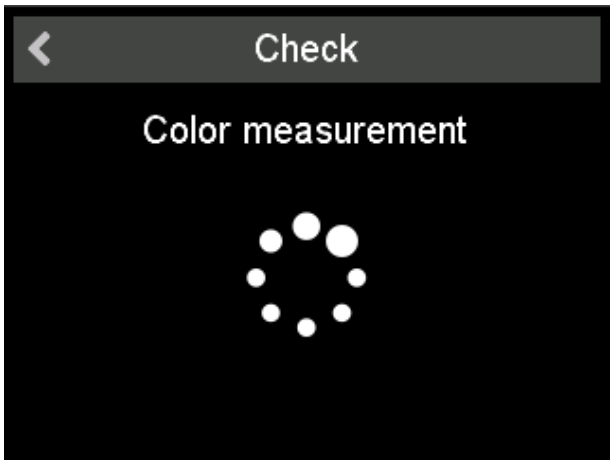


Illustration 22: Green check – color measurement

6. Afterwards the screen below is displayed.

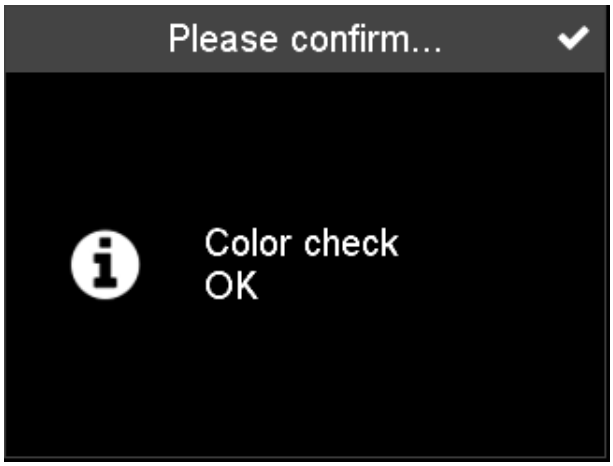


Illustration 23: Color check on green tile successful

7. Click on the checkmark in the upper right corner.

Repeat the green check every seven days.

Green Check Failed

In case of an unsuccessful green check, consult section Troubleshooting [▶ 47].

5 Measure

The measure function is accessible via the **Measurement** icon in the main menu.

The instrument provides two ways to perform measurements.

- Measure without Worklist [▶ 27]
- Measure with Worklist [▶ 28]

Both scenarios are explained below.

The instrument is available in two variants:

- With display of values after each measurement, see Displayed Values [▶ 31]
- Without display of values after each measurement

In both cases, the measurement values are stored in the instrument memory.

You can browse and delete measurement values using the **Browse** icon accessible via the main menu, see Browse [▶ 32].

Number of Measurements

The number of single measurements during a sample reading depends on your customization of the firmware. Default number of single measurements is three. Measurement results are average values of single measurements.

5.1 Measure without Worklist

1. Open the snap closure.
2. Click on the **Measurement** icon in the main menu and place the instrument on the sample.
3. The screen below is displayed. The four circles in the corners represent the four pins on the bottom of the instrument. Green colored circles indicate pressed pins, while red colored circles indicate not pressed pins. At least three circles needs to be green (three pins must be pressed).

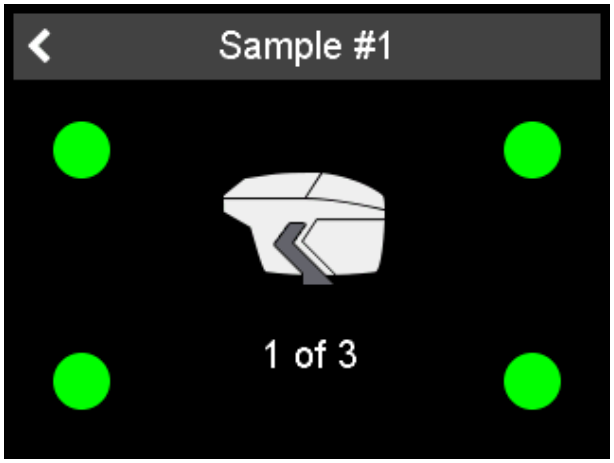


Illustration 24: Green colored circles indicating pressed pins

4. Click on the instrument icon in the middle of the screen or press the button **Operate** to start the measurement.
5. The measurement is carried out. In order to go on with the next measurement, lift the instrument and replace it on the sample again. Again, at least three circles needs to be green (three pins must be pressed).

6. Repeat step two as many times as you customized the number of single measurements for the sample measurement. Default number of measurements is three.
7. The screen below is displayed.

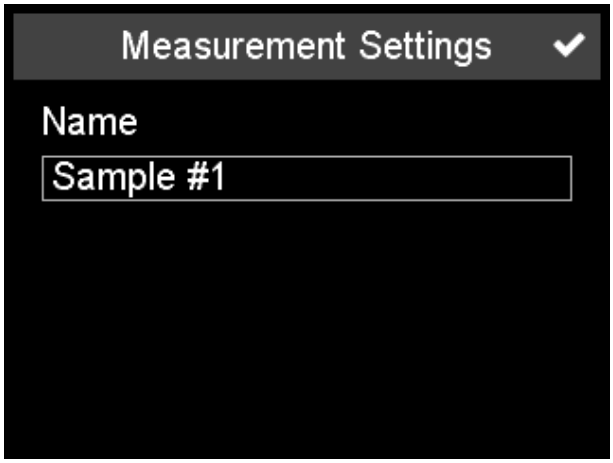


Illustration 25: Allocation of a desired name or usage of predefined name

8. Allocate a name for the measurement by clicking on the name field and enter the desired name. You can also accept the predefined name ("Sample" and an incrementing number) by clicking on the checkmark in the upper right corner.

Illustration 26: Input of a desired name

9. Click on the checkmark in the upper right corner**.**

The measurements are finished. The average values are stored in the instrument memory.

5.2 Measure with Worklist

In order to organize the working procedure, you can predefine a worklist in your individual software and download it to the instrument. A worklist consists the names of samples you want to measure – for example "Car 1" or "Red Audi".

Once a worklist is downloaded to the instrument, you can select the appropriate name of the sample you want to measure. The instrument will link the measured values with the predefined names.

Prerequisite: You are familiar with Measure without Worklist [▶ 27].

5.2.1 Load Worklist

You cannot create a worklist directly on the instrument. In order to create a worklist, you have to use your individual software.

The instrument needs to be connected with the PC via USB cable or WiFi. The procedure for loading a worklist into the instrument depends on your individual software. Proceed accordingly.

5.2.2 Delete Worklist

You cannot delete a worklist directly on the instrument. In order to delete a worklist, you have to use your individual software.

The instrument needs to be connected with the PC via USB cable or WiFi. The procedure for deleting a worklist in the instrument depends on your individual software. Proceed accordingly.

5.2.3 Measure Worklist

1. Open the snap closure.
2. Click on the **Measurement** icon in the main menu.
3. The screen below is displayed. It indicates the predefined names. Measurements that are not associated with the worklist can be done by selecting the first list item – for example "Sample #1".

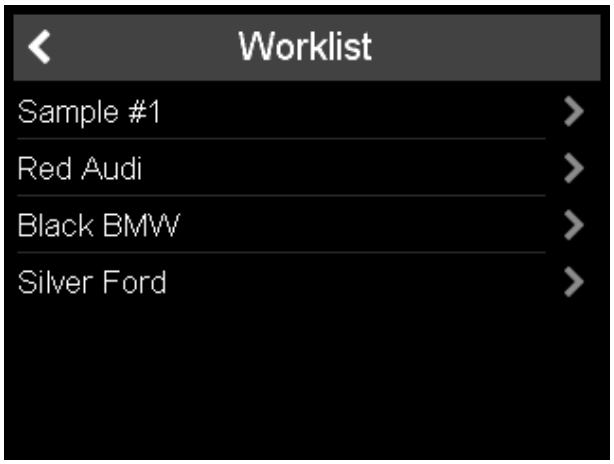


Illustration 27: Measure with worklist – initial worklist

4. Place the instrument on the sample and select the appropriate worklist item by clicking on the arrow behind the name.
5. The screen below is displayed.

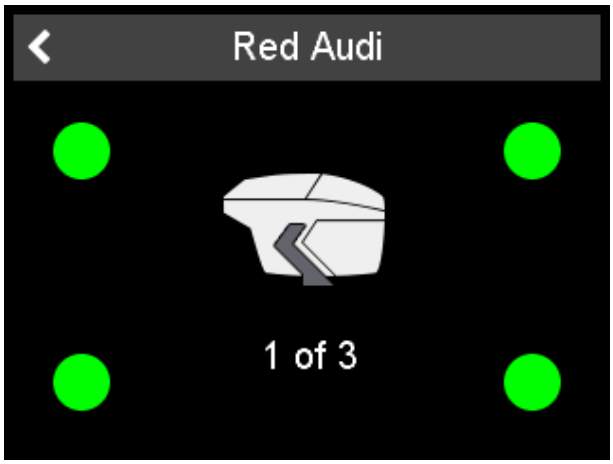


Illustration 28: Measure with worklist –worklist item

6. Click on the **Measurement** icon in the middle of the screen or press the button **Operate** - analog to Measure without Worklist [▸ 27].
7. Perform the requested number of measurements.
8. This worklist item is removed from the worklist.

Illustration 29: Measure with worklist – final worklist

The measurements are finished. The average values are stored in the instrument memory.

5.2.4 Store Worklist

The measured values are linked to the corresponding items in the worklist. In order to evaluate the items in the worklist, you have to use your individual software.

The instrument needs to be connected with the PC via USB cable or WiFi. The procedure for storing a worklist on the PC depends on your individual software. Proceed accordingly.

5.3 Displayed Values

The instrument variant that displays values after each measurement shows following screen after each measurement.

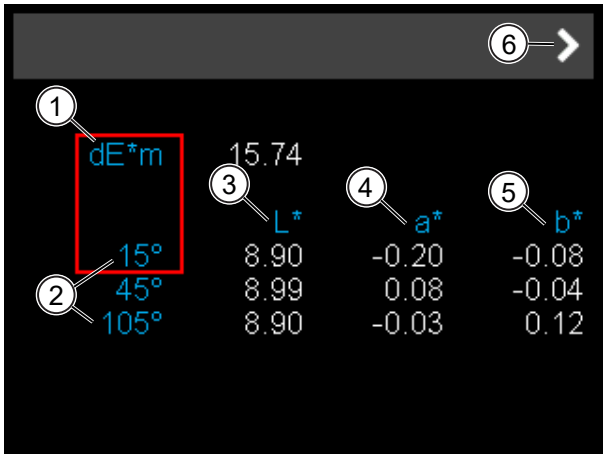


Illustration 30: Output of measurement values

1	**dE*m**: Difference of current reading to the average value for the 15° measurement angle.	2	Measurement angles
3	**L***: Lightness	4	**a***: Red/green axis
5	**b***: Yellow/blue axis	6	Continue with next measurement

Check the difference value to the 15° angle value. If the difference is to large, delete the measurement – see Delete Measurement Values [▶ 33] – and repeat.

6 Browse

Measurement values are stored in the instrument memory. The instrument memory is accessible via the **Browse** icon in the main menu. Stored values are the average values of the measured sample.

6.1 View Measurement Values

1. Click on the **Browse** icon in the main menu.
2. A list with all stored sample measurements appears.

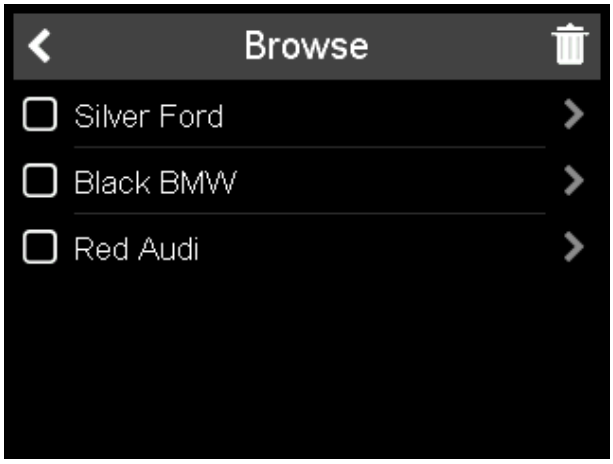


Illustration 31: Stored sample measurements

3. Use the yellow scroll bar in order to browse the list.
4. Select the desired sample by clicking on the arrow behind the name.
5. The screen below is displayed (with different values).

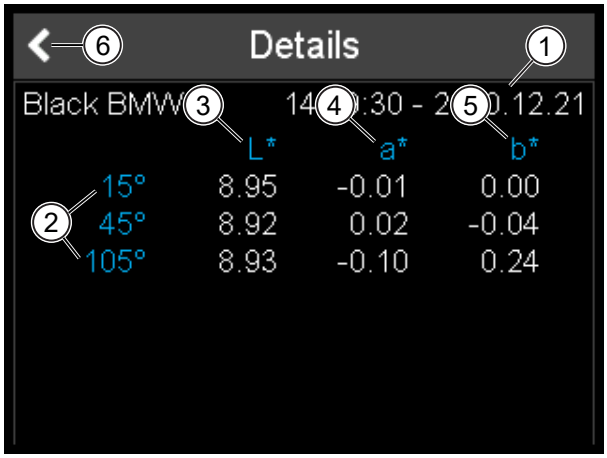


Illustration 32: Stored measurements details

1	Time and date of measurement	2	Measurement angles
3	**L*:** Lightness	4	**a*:** Red/green axis
5	**b*:** Yellow/blue axis	6	Go back to memory list

The displayed values are the average values of the measured sample.

6.2 Delete Measurement Values

1. Click on the **Browse** icon in the main menu.
2. Select the sample(s) you want to delete by clicking on the square in front of the sample name.

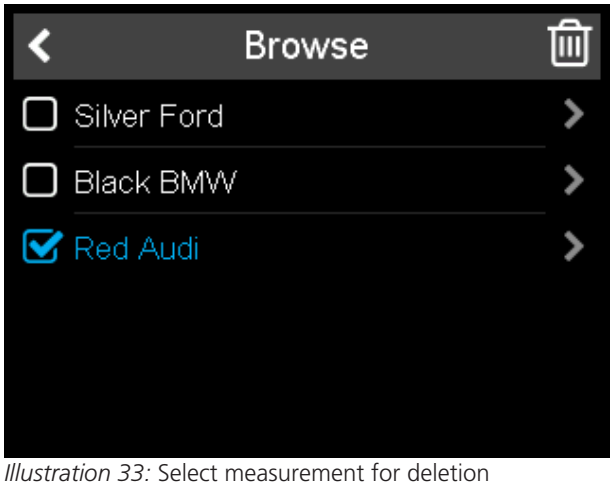


Illustration 33: Select measurement for deletion

3. Delete the sample by clicking on the trash can icon in the upper right corner.

The selected samples are deleted without further confirmation.

7 Configuration

The configuration menu is accessible via the **Configuration** icon in the main menu. You can change settings or get instrument information here.

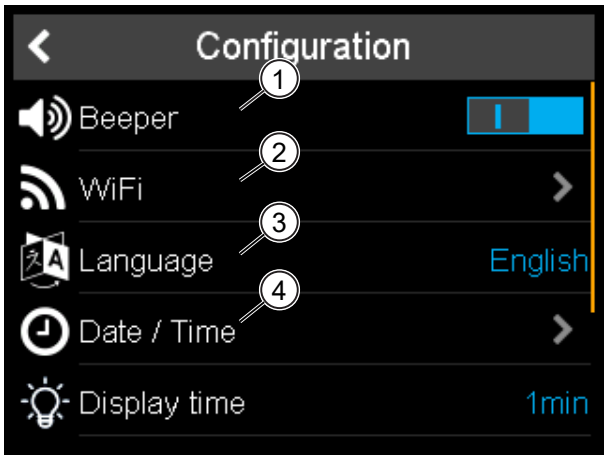


Illustration 34: Configuration menu - part #1

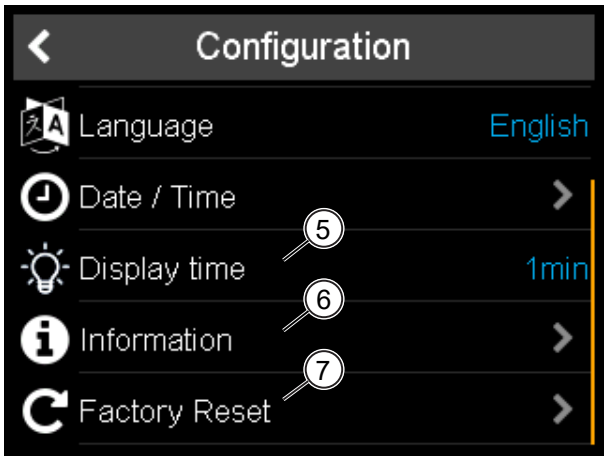


Illustration 35: Configuration menu - part #2

1	Beeper [▶ 35]: The instrument gives an audio signal after measurements. You can switch the beeper on / off.	5	Select Display Time [▶ 41]: Define interval for automatic shutdown of instrument if not used.
2	WiFi [▶ 35]: Connect / disconnect the instrument with WiFi. Only present if you use the WiFi product variant.	6	Information [▶ 42]: Get instrument, calibration and network information.
3	Language [▶ 39]: Select instrument language.	7	Factory Reset [▶ 44]: Restore the factory settings.
4	Date / Time [▶ 40]: Configure date and time in the instrument.		

7.1 Turn Beeper On / Off

1. Click on the **Configuration** icon in the main menu.
2. The configuration menu appears.
3. Click on the switch symbol in order to turn the beeper on or off.

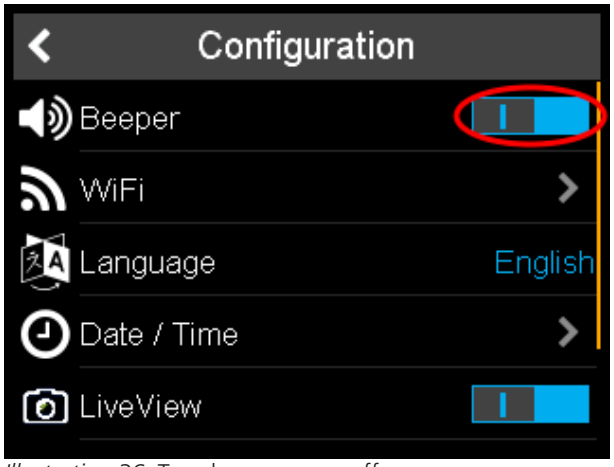


Illustration 36: Turn beeper on or off

The beeper is turned on or off.

7.2 Activate WiFi

Prerequisites:

- You need to use the WiFi product variant.
- A WiFi connection needs to be available.

You have following options:

1. Connect with WiFi [▶ 35]
2. Disconnect from WiFi [▶ 38]
3. Reconnect with WiFi [▶ 38]

See also

Get Network Information [▶ 43]

7.2.1 Connect with WiFi

1. Go to **Configuration > WiFi**.
2. The screen below is displayed.

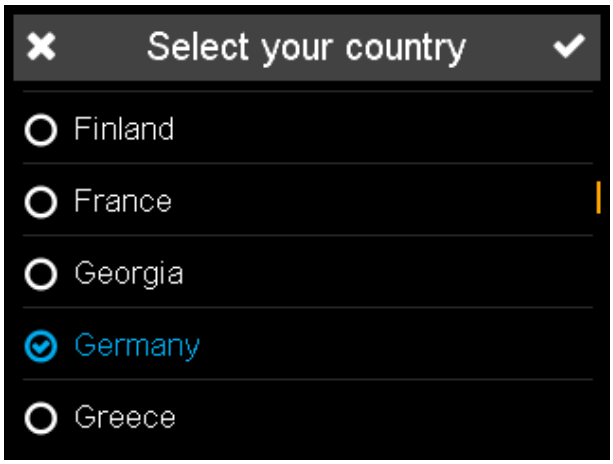


Illustration 37: WiFi connection - Country selection

3. Select your country from the list and proceed.

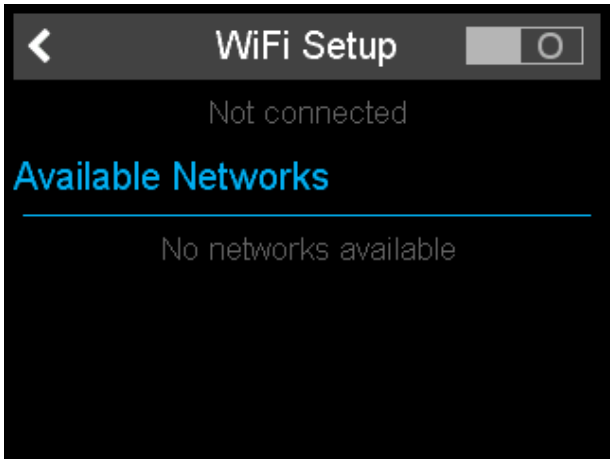


Illustration 38: WiFi connection - Inactive

4. Click on the switch symbol in the upper right corner in order to turn on WiFi.
5. A list with all available WiFi connections appears. The list below consists of dummy names. The instrument will show the actual WiFi connections in your area.

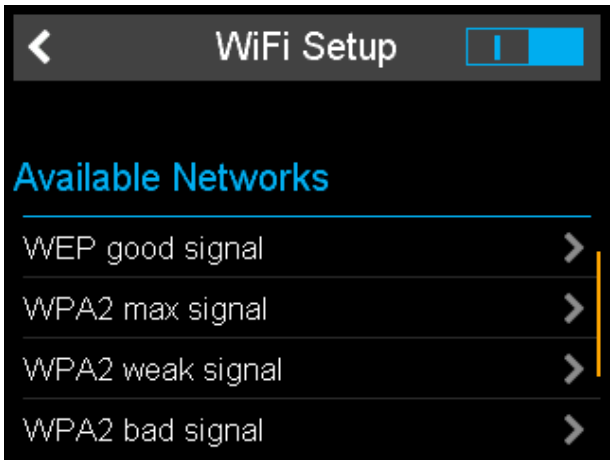


Illustration 39: WiFi connection - Available networks

6. Use the yellow scroll bar in order to browse the list. Select the desired connection by clicking on the arrow behind the name.
7. The screen below is displayed.

Illustration 40: WiFi connection - Password for network

8. Enter the WiFi key and click on the checkmark in the upper right corner. You can cancel by clicking on the "x" in the upper left corner.
9. Finally a confirmation message is displayed.

Illustration 41: WiFi connection - Confirmation message

10. Confirm the message.

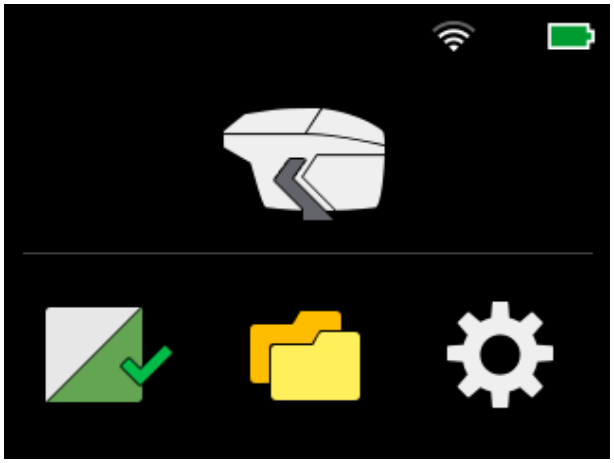


Illustration 42: WiFi connection - Connected

The instrument is connected with WiFi - denoted by the WiFi symbol in the Main Menu [▶ 22].

7.2.2 Disconnect from WiFi

1. Go to **Configuration > WiFi**.
2. Click on the switch symbol in the upper right corner in order to turn off WiFi.

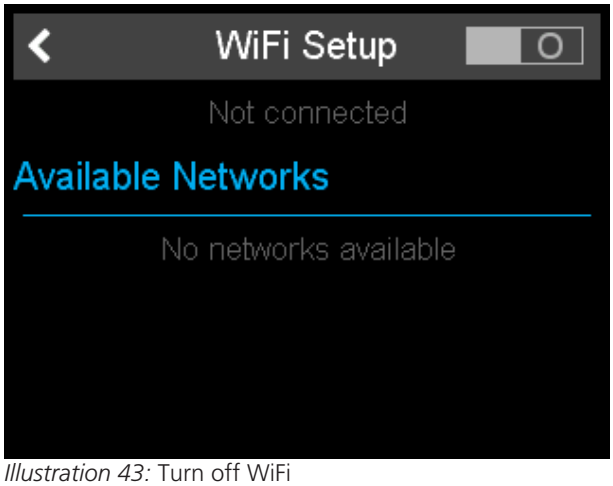


Illustration 43: Turn off WiFi

The instrument is disconnected from WiFi.

7.2.3 Reconnect with WiFi

Networks already connect are listed on top of the screen.

Illustration 44: Reconnect WiFi

You can reconnect to these networks without password input.

To reset these networks, use the function Perform Factory Reset [▶ 44].

7.3 Select Language

The number of selectable languages is extendable up to 20. Approach BYK-Gardner if you want to implement a specific instrument language.

1. Go to **Configuration > Language**.
2. A list with selectable languages appears.

Illustration 45: Select instrument language

3. Use the yellow scroll bar to browse the list.
4. Click on the desired language.
5. Click on the checkmark in the upper right corner.

The selected language is set in the instrument. Following languages are available by default:

- English
- German
- French
- Italian
- Spanish
- Portuguese
- Russian
- Japanese
- Chinese

Additional languages can be offered on request.

7.4 Enter Date and Time

You have following options:

1. Select Time Zone [▶ 40]
2. Set Time [▶ 40]
3. Set Date [▶ 41]

7.4.1 Select Time Zone

1. Go to **Configuration > Date / Time > Time Zone**.
2. A list with selectable time zones appears.

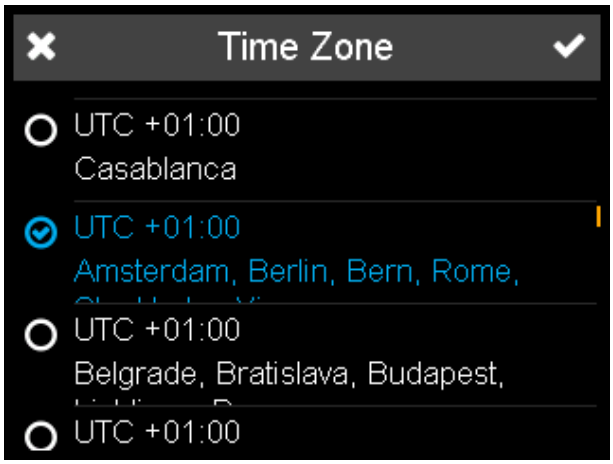


Illustration 46: Select time zone

3. Use the yellow scroll bar in order to browse the list.
4. Click on the desired time zone.
5. Click on the checkmark in the upper right corner.

The time zone is selected.

7.4.2 Set Time

1. Go to **Configuration > Date / Time > Time**.
2. The screen below is displayed.

Illustration 47: Set time

3. Click on the switch symbol in the upper row in order to turn daylight saving on or of.

4. Set time format, hour and minute by wiping true the displayed options.
5. Click on the checkmark in the upper right corner.

The time is set.

7.4.3 Set Date

1. Go to **Configuration > Date / Time > Date**.
2. The screen below is displayed.

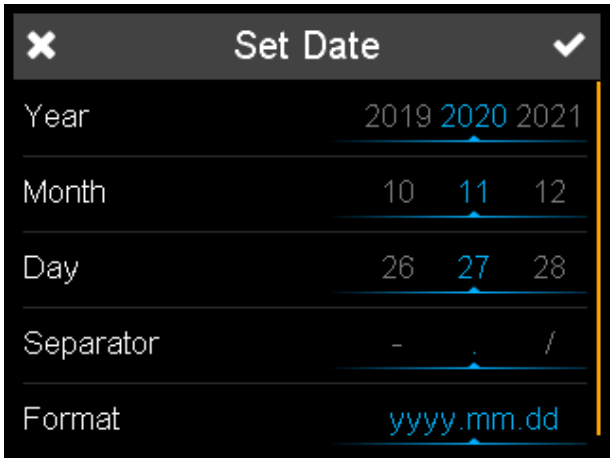


Illustration 48: Set date

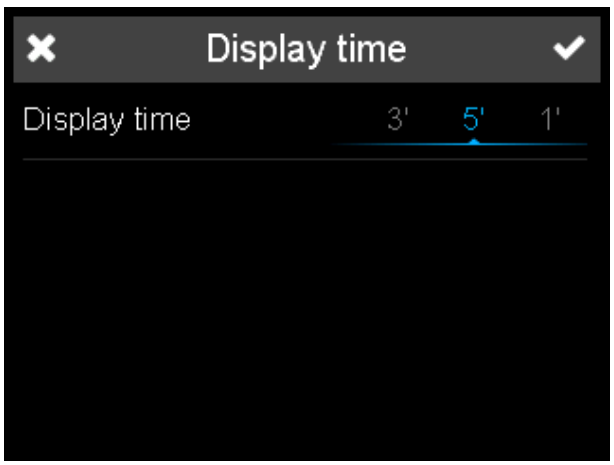
3. Set year, month, day, separator and date format (sequence of day, month and year) by wiping true the displayed options.
4. Click on the checkmark in the upper right corner.

The date is set.

7.5 Select Display Time

You can define the interval for an automatic shutdown of the instrument if it is not used.

1. Go to **Configuration** > **Display Time**.
2. A wheel with selectable intervals appears.



3. Select the desired option: 1 / 2 / 3 / 5 minute(s).
4. Confirm with the check mark.

7.6 Get Instrument Information

You have following options:

1. Get General Information [▶ 42]
2. Get Calibration Information [▶ 42]
3. Get Network Information [▶ 43]

7.6.1 Get General Information

1. Go to **Configuration > Information**.
2. General instrument information is displayed.

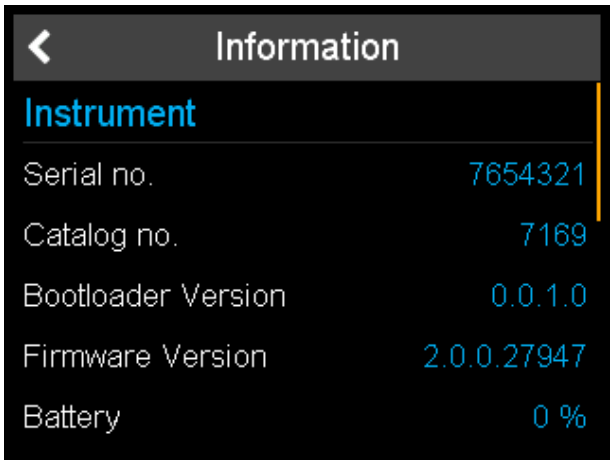


Illustration 49: Instrument information

The screen above shows dummy values. The instrument will show the actual values.

7.6.2 Get Calibration Information

1. Go to **Configuration > Information**.
2. Use the yellow scroll bar in order to browse the list until you reach the section **Calibration**.
3. The screen below is displayed.

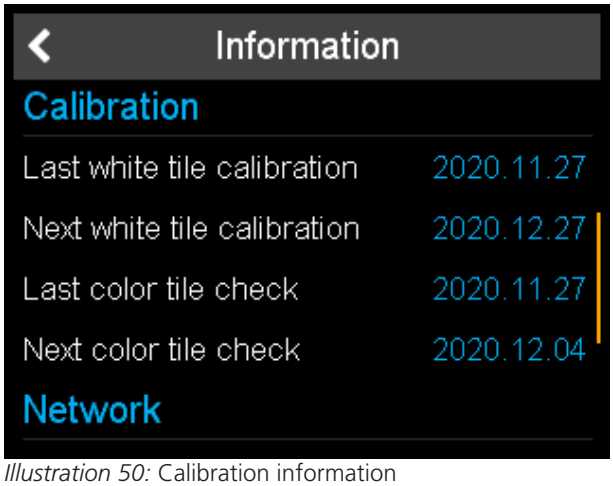


Illustration 50: Calibration information

It shows the date of the last white calibration and the last green check.

See also

Calibration and Check [▶ 23]

7.6.3 Get Network Information

1. Go to **Configuration > Information**.
2. Use the yellow scroll bar in order to browse the list until you reach the section **Network**.
3. The screen below is displayed.

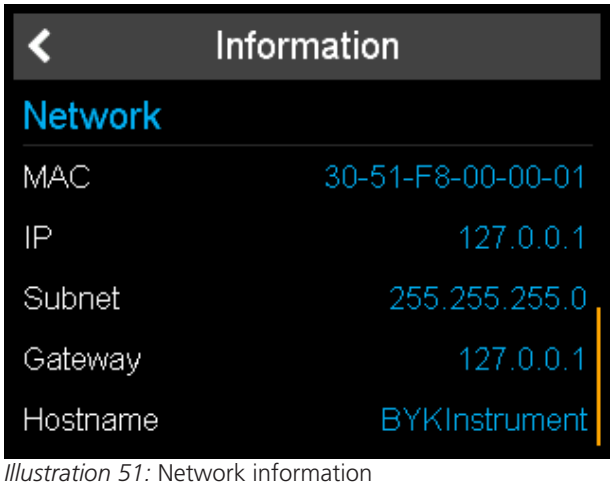


Illustration 51: Network information

7.7 Perform Factory Reset

A factory reset clears following data in the instrument memory:

- All readings
- All settings
- Calibration details
- Connected WiFi networks
- Counter for measured samples

1. Go to **Configuration** > **Factory Reset**.
2. The screen below is displayed.

Illustration 52: Factory reset – confirmation request

3. Click on the checkmark in the upper right corner.
4. The data is cleared and the screen below is displayed.

Illustration 53: Factory reset – confirmation message

5. The confirmation message disappears after few seconds.

The instrument is now in the state of delivery.

Note:

To perform just a reboot see Troubleshooting [▶ 47].

8 Appendix

8.1 Technical Data

8.1.1 General

Memory	Up to 500 measurements
Power Supply	Li-Ion battery pack
Interface Docking Station	USB type B, proprietary plug
Interface Instrument	USB type C
Power Input Docking Station	5 V ⎓ ; max. 2 A
Power Input Instrument	5 V ⎓ ; max. 2 A
Dimensions (LxWxH)	170 x 65 x 105 mm (6.7 x 2.5 x 4.3 in)
Weight	Approx. 500 g (1.1 lbs)
Temperature Range	For operation: 10 °C to 40 °C (50 °F to 104 °F) For storage: 0 °C to 60 °C (32 °F to 140 °F)
Relative Humidity	Up to 85% non-condensing at 35°C (95 °F)
Operation Altitude	Up to 2000 m (6561 ft)
Default Languages	English, German, French, Italian, Spanish, Portuguese, Russian, Japanese, Chinese

8.1.2 Instrument

Measuring Geometry	Illumination 45° 15°; 45°; 105° aspecular viewing or 25°; 45°; 75° aspecular viewing
Spectral Range	400 - 700 nm, 10 nm resolution
Measurement Range	0...500% reflectance
Measuring Time	3 seconds
Repeatability	White: dE ≤ 0.03 20 measurements on white tile
Reproducibility	≤ 0.3 dE avg. on BCRA tile set at 45° ≤ 0.5 dE max on any chromatic tile at 45° ≤ 0.2 dE max on any grey tile at 45° ≤ 0.8 dE max on metallic standards at 15° and 25° ≤ 0.5 dE max on metallic standards at 45°, 75° and 105°

8.1.3 Touch Screen

Stylus Pen Input	Tip radius ≥ 0.8 polyacetal pen
Activation Force	40 (typ.) 80 (max.) gf (gram force) Do not operate it with anything but a polyacetal pen (tip radius ≥ 0.8 mm) or a finger. Do not use devices with hard or sharp tips such as a ball point pen or a mechanical pencil.

8.1.4 WLAN RF Specifications

Frequency Range		2400 – 2483.5 MHz	
IEEE Standards	802.11b	802.11g	802.11n
Modulation	DSSS/CCK	OFDM	OFDM
Physical Layer Data Rate	Max. 11 Mbps	Max. 54 Mbps	Max. 65 Mbps
Max. Output Power	18.5 dBm	17.5 dBm	17.0 dBm

8.1.5 WLAN Antenna

Max. Gain	2 dBi

All mentioned color tolerances are based on the ΔE 94 color difference equation.
All numeric tolerances are truncated to the 1st decimal point.

8.2 Troubleshooting

Problem/Error message	Solution
Error! White tile calibration.	Repeat white calibration.
Error! Please clean white tile or call customer service.	Clean white tile and repeat white calibration. If white calibration fails again, contact service.
Error! Color tile check. Please clean tile and retry.	Clean green tile. Repeat green check. If green check fails three times, the instrument asks you to perform a white calibration. After white calibration, repeat green check. If green check fails again, contact service.
Pins not pressed. Please place instrument on surface and repeat measurement.	Make sure that at least three pins are pressed. Make sure to hold the instrument stable during measurement. Repeat measurement.
Ambient light.	Appears if an error occurs during measurement. Make sure to completely cover measurement aperture. Repeat measurement.
Battery empty. Instrument is switching off...	Charge the instrument.
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.
Light protection ring is broken or fell off.	Contact your paint maker service technician.
Instrument is not working anymore or display is frozen.	Press button **Operate** for 15 seconds. Instrument performs new boot procedure.

8.3 Service and Maintenance

8.3.1 General Information

⚠ CAUTION

Damage by inserting of objects

Inserting any objects into the measurement aperture could damage the instrument.

⚠ CAUTION

Damage by using acetone for cleaning

Do not use acetone for cleaning. Instrument housing, white and green standard tile can be damaged when they get in contact with acetone.

⚠ CAUTION

Damage by the attempt of self-repair

The instrument can be damaged. Warranty claims expire. Do not attempt to make any repairs yourself. Contact our customer service in case of malfunction.

8.3.2 Storing the Instrument

Align the protective snap closure when the instrument is not in use. Use the instrument case for storage.

8.3.3 Cleaning the Instrument

Use a soft, moist cloth for cleaning. For cleaning excessive dirt, use propanol.

8.3.4 Cleaning the Standard Tiles

Using dirty or damaged standard tiles can impact the accuracy of measurements significantly. Clean the standard tiles when they are dirty in order to avoid measuring inaccuracy.

NOTICE

Be careful when cleaning the standard tiles

Apply only slight pressure as you clean and make certain there are no large particles stuck in the cloth that could damage the surface. We highly recommend to handle the standard tiles with great care. Store them always enclosed.

Use a new lint-free cloth, dust-free lens paper or an optical cloth for cleaning. For dirt that is difficult to remove, use an optical cloth dipped in propanol. Then wipe the surface with a dry optical cloth.

8.3.5 Calibration and Repair Service

Our Service Offer

BYK-Gardner´s global network of own ISO/IEC 17025 accredited service points is equipped with the full line of reference measuring standards and tools needed to ensure highest quality service on a global basis:

- Preventive maintenance for a longer life
- Certification services for standards and physical testing tools
- Repair service
- On-site service

You can find more details on our website:

- https://www.byk-instruments.com/tw/en/technical-services

Preventive Maintenance

To increase the reliability and life time of your instrument, regular inspections and optimizations are recommended. With our preventive maintenance solution your instrument will always be in the best shape. We clean the optics, check all functions, test and, if required, adjust the measured values by using reference standards.

Preventive maintenance is recommended every 12 – 24 months depending on usage and should only be performed by BYK-Gardner technical service centers. For the list of certified service centers see Service Points [▶ 50].

8.3.6 Service Points

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
Service Point Austria, Hungary, Slovenia c/o Friedrich W. Bloch GmbH Wagramerstrasse 201, 1210 Vienna, Austria	**Service Point France** c/o Eckart France S.A.S. 31 Rue Amilcar Cipriani 93400, Saint Ouen, France	**Service Point Spain** c/o Actega Artística S.A.U. Calle Balmes 8, Suite: 3º 2ª, 08291 Ripollet, Spain
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	**Service Point India** BYK India Pvt. Ltd. 147, Mumbai - Pune Road 411018 Pune Maharashtra, India	**Service Point Japan** c/o Tetsutani Co. Ltd. Chuo-ku, Osaka, Tokui cho 2-2-2, Japan
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

Notes

A member of ALTANA

Download your manuals from:
https://www.byk-instruments.com/micro-tri-color

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