MA-T6/MA-T12
Spectrophotometer

User Guide

x-rite

Consult this documentation in all cases where the Attention symbol ⚠ appears. This symbol is used to inform you of any potential HAZARD or actions that may require your attention.

CE Declaration

CE

Hereby, X-Rite, Incorporated, declares that this model is in compliance with the essential requirements and other relevant provisions of Directive(s) RED 2014/53/EU, LVD 2014/35/EU, and RoHS 2011/65/EU.

Models with WiFi:

CE Mark: Radio Equipment Directive (2014/53/EU)
EN 300 328 V2.1.1
EMC : EN 301 489-1 V2.1.1, EN 301 489-17 V.3.1.1,
EN 55022:2010/AC:2011, EN 55024:2010
Health : EN 62311: 2008
Safety : EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013

EAC Certification

EAC

Hereby X-Rite Incorporated declares that this device is in compliance with the technical regulations of the customs union according to declaration registration number: TC N RU Д-US.A301.B.01051

For more information please see http://fsa.gov.ru/

Federal Communications Commission Notice

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

Models with WiFi:

Contains FCC ID: LSV-KOHSPEC

NOTICE:
Changes or modifications made to this equipment not expressly approved by (manufacturer name) may void the FCC authorization to operate this equipment.

Industry Canada Compliance Statement

CAN ICES-3 (A) / NMB-3 (A)

Models with WiFi:

Contains IC ID: 20894-KOHSPEC

RF Exposure

- The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such a manner that the potential for human contact during Wi-Fi transmission is minimized.
- La puissance rayonnée par cet appareil est très inférieure aux limites d'exposition aux ondes radio définies par la FCC. Néanmoins, l'appareil doit être utilisé de telle manière que le potentiel de contact humain pendant la transmission par Wi-Fi soit minimisé.

Japanese Ministry of Internal Affairs and Communications (MIC)

R 209-J00317

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。

SRRC (State Radio Regulation of China) Certification

CMIIT ID: 2016DJ1364

전파연구원

모델 번호: KOH Spectrophotometer

등록 번호: MSIP-REM-XRT-KOHSPEC

Equipment Information

Use of this equipment in a manner other than that specified by X-Rite, Incorporated may compromise design integrity and become unsafe.

To avoid discomfort, do not look directly into the measurement optics when the instrument is on.

Do not immerse the instrument in liquid.

Operational hazard exists if an AC adapter other than X-Rite P/N SE30-277 is used.

Use the rechargeable Li-ion batteries provided (X-Rite P/N SE15-40 / E-One Moli Energy Corp Model MCR-1821J/1-H); other types may burst causing personal injury.

Transportation: This product contains a lithium-ion battery. Should you need to ship this device, you may wish to consult published guidance documents by one or more of these organizations for advice on how to comply with the regulations: IATA, ICOA, IMDG & PHMSA. The battery contained in this device is 107g in weight, 7.4V, 2.4 Ah, and complies with the UN 38.3 tests in effect the year it was originally shipped.

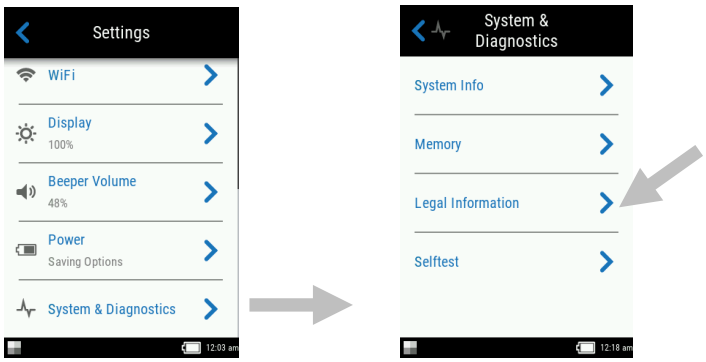
Please remove the battery from the device before shipping.

The product is a sensitive measurement instrument. If the instrument experiences a drop, a calibration should be performed before any measurements are taken to ensure the instrument is working properly. Refer to the Calibration Mode section for information on performing a Calibration.

Instructions for disposal: Please dispose of Waste Electrical and Electronic Equipment (WEEE) at designated collection points for the recycling of such equipment.

Certification of Compliance

See the "Legal Information" menu on the device for additional certification and compliance marks. To view, choose Settings > System and Diagnostics > Legal Information.



Proprietary Notice

Warranty Information

X-Rite warrants this Product against defects in material and workmanship for a period of twelve (12) months from the date of shipment from X-Rite's facility, unless mandatory law provides for longer periods. During such time, X-Rite will either replace or repair at its discretion defective parts free of charge.

X-Rite's warranties herein do not cover failure of warranted goods resulting from: (i) damage after shipment, accident, abuse, misuse, neglect, alteration or any other use not in accordance with X-Rite's recommendations, accompanying documentation, published specifications, and standard industry practice; (ii) using the device in an operating environment outside the recommended specifications or failure to follow the maintenance procedures in X-Rite's accompanying documentation or published specifications; (iii) repair or service by anyone other than X-Rite or its authorized representatives; (iv) the failure of the warranted goods caused by use of any parts or consumables not manufactured, distributed, or approved by X-Rite; (v) any attachments or modifications to the warranted goods that are not manufactured, distributed or approved by X-Rite. Consumable parts and Product cleaning are also not covered by the warranty.

X-Rite's sole and exclusive obligation for breach of the above warranties shall be the repair or replacement of any part, without charge, which within the warranty period is proven to X-Rite's reasonable satisfaction to have been defective. Repairs or replacement by X-Rite shall not revive an otherwise expired warranty, nor shall the same extend the duration of a warranty.

Customer shall be responsible for packaging and shipping the defective product to the service center designated by X-Rite. X-Rite shall pay for the return of the product to Customer if the shipment is to a location within the region in which the X-Rite service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations. Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the unit is within the Warranty period must be presented to obtain warranty service. Do not try to dismantle the Product. Unauthorized dismantling of the equipment will void all warranty claims. Contact the X-Rite Support or the nearest X-Rite Service Center, if you believe that the unit does not work anymore or does not work correctly.

THESE WARRANTIES ARE GIVEN SOLELY TO BUYER AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION,

AND NON-INFRINGEMENT. NO EMPLOYEE OR AGENT OF X-RITE, OTHER THAN AN OFFICER OF X-RITE, IS AUTHORIZED TO MAKE ANY WARRANTY IN ADDITION TO THE FOREGOING.

IN NO EVENT WILL X-RITE BE LIABLE FOR ANY OF BUYER'S MANUFACTURING COSTS, OVERHEAD, LOST PROFITS, GOODWILL, OTHER EXPENSES OR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES BASED UPON BREACH OF ANY WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL THEORY. IN ANY EVENT OF LIABILITY, X-RITE'S MAXIMUM LIABILITY HEREUNDER WILL NOT EXCEED THE PRICE OF THE GOODS OR SERVICES FURNISHED BY X-RITE GIVING RISE TO THE CLAIM.

Table of Contents

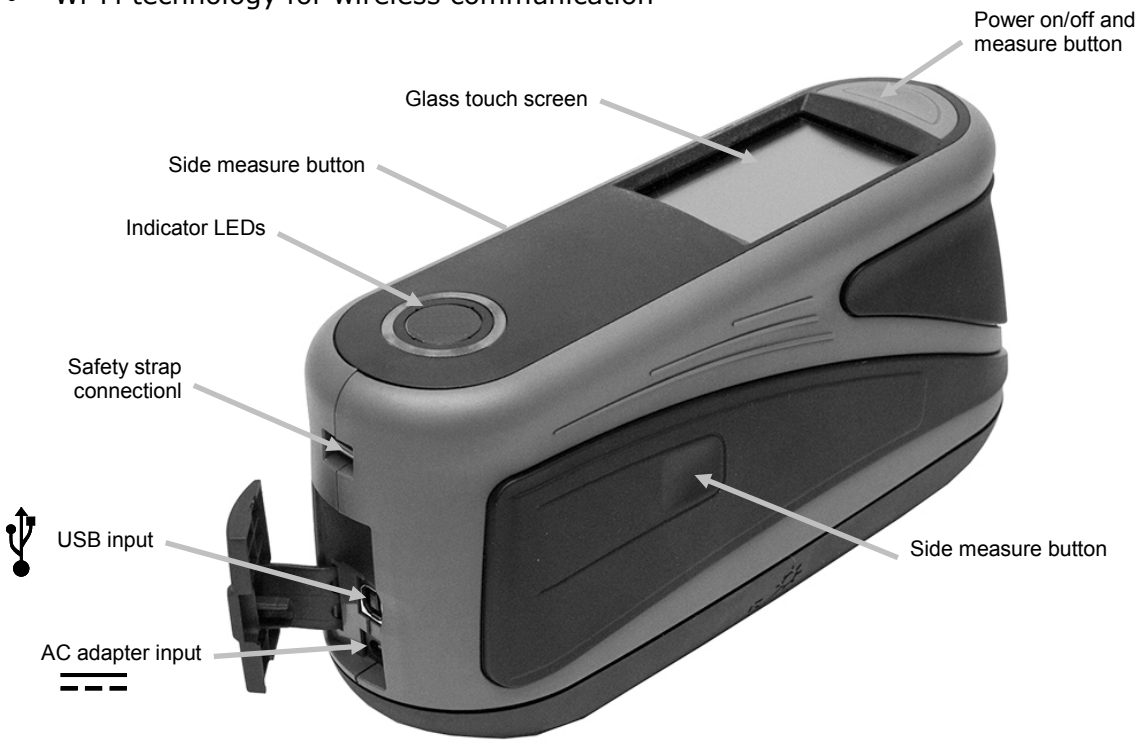
INTRODUCTION AND SETUP

The multi-angle spectrophotometer is designed for consistent, precise color measurement of metallic, pearlescent, and other complex special effect finishes.

This manual covers the installation, operation and maintenance of the instrument. Specific instructions for using the instrument with your software application can be found in the software documentation.

Key features of the instrument are:

- Color display with touch screen operation
- Measure and power on/off buttons
- Video targeting system for accurate positioning
- Three pressure sensors located on the bottom of the instrument to aid in proper positioning
- Wi-Fi technology for wireless communication



Packaging

Your instrument packaging should contain all the items listed below. If any of these items are missing or damaged, contact X-Rite or your Authorized Representative.

- MA-T6 or MA-T12 instrument
- Carrying case
- USB interface cabling
- AC adapter (X-Rite P/N SE30-277) and line cord
- Calibration reference
- Safety strap
- 2 Li-ion rechargeable battery packs
- Quick Start Guide

Installing the Battery Pack

Your new instrument is shipped from the factory with the battery pack removed. Two battery packs (one is a spare) are located in the instrument case and should be charged before use. Refer to "Charging the Battery Pack" later in this section for charging details. The instrument will also operate from the AC adapter without a battery pack installed.

1. Carefully turn the instrument over and slide open the latch (1) that secures the battery pack access cover. Open the access cover.
2. Slide the new battery pack (2) into the instrument with the battery contacts facing down until the battery is positioned below the holding latch (3).
3. Close the access cover by pressing down until it locks into position.

⚠ Use the rechargeable Li-ion batteries provided (X-Rite P/N SE15-40 / E-One Moli Energy Corp Model MCR-1821J/1-H); other types may burst causing personal injury. Replacement batteries can be purchased from your authorized X-Rite representative or E-One Moli Energy Corp.

Powering On

The power/measure button is used to initiate the instrument from a power off state. Simply press the button (1) to turn on the instrument. If the instrument does not power up after pressing the power button, the batteries may require charging. Refer to Charging the Battery Pack. The instrument is also powered on by plugging the AC adapter into an outlet.

Powering Off

The instrument can be manually powered off by pressing and holding the power button for three seconds and tapping **Power Off**, or by using the Settings menu.

When first powered up, the instrument goes through a diagnostics test and displays a splash screen before the main screen appears.

Splash Screen **Main Screen**

Charging the Battery Pack

General

The battery pack for your new instrument comes in a low to medium charge state and should be charged before use (up to 4 hours for full charge).

A charged battery pack may eventually lose partial charge if not used for an extended amount of time. You should charge the battery from time to time and store in a cool environment when not in use to maintain battery performance.

The battery pack can be charged in the instrument (see Connecting the AC Adapter) or by use of the optional charging station. The charging station is useful for charging up to two battery packs.

Battery Charge Temperature Range

5°C to 40°C

Lifespan Expectations

Lithium-ion batteries typically decay to 80% capacity after 700 charge cycles (see chart below). A charge cycle can be defined as several partial charges equaling 100%. Partial charge and discharge cycles will help maintain the life of the battery. It is best to avoid full discharge and charge cycles. After roughly 700 charge cycles are reached, the amount of measurements you can expect to achieve from one full charge is reduced. At this point, you may wish to replace the battery pack.

Disposal

Dispose of the battery pack in a designated disposal location for recycling.

Using the Charging Station

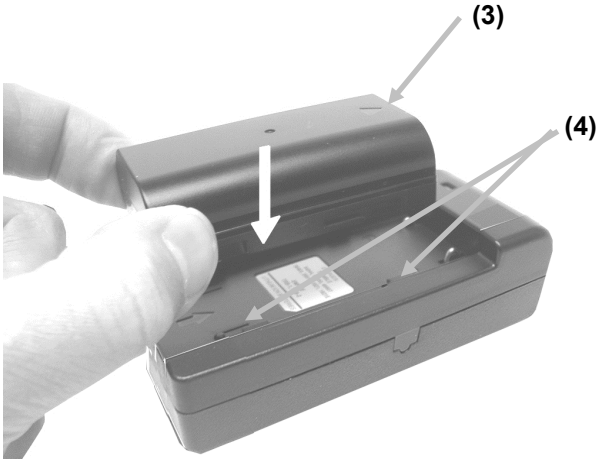
The charging station has a indicator LED that illuminate "red" when a battery pack is charging, amber when battery pack is close to a full charge, and "green" when no battery is inserted or after the battery is fully charged. A battery pack takes approx. 4 hours to reach a full charge from a completely discharged state.

1. Insert the small plug from the AC adapter into the input (1) on the side of the charging station.
2. Plug the detachable line cord into the AC adapter and plug the line cord into the wall receptacle.

Note: The AC adapter used for the charging station is the same adapter that is used to power the instrument.

3. Position a battery pack (3) over the charging location with the locking tabs (4) in the station directly below the slots in the battery. Make sure the arrow (3) on the top of the battery pack is facing the LED end of the station.

4. Lower the battery pack into position and slide it toward the LED (2) until it stops. Depending on the battery packs current charge state, the LED will illuminate "red", "amber", or "green" when properly seated.

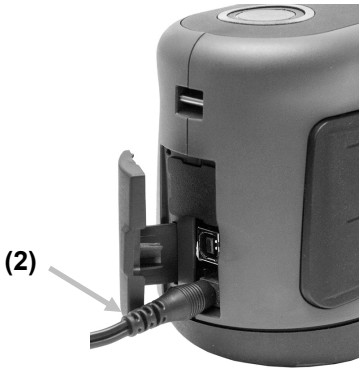


5. After charging is complete, slide the battery in the opposite direction of the LED until it stops and lift upward to remove.

Connecting the AC Adapter

NOTE: The instrument can operate from the AC adapter only. The battery pack does not need to be installed. The AC adapter (X-Rite P/N SE30-277) overrides any charge condition of the battery pack in the instrument. Measurements can be taken even with a very low battery condition when using the AC adapter and the battery pack is charging.

1. Verify the voltage indicated on the AC adapter complies with the AC line voltage in your area.
2. Open the access cover (1) at the back of the instrument.
3. Insert the small plug from the AC adapter (2) into the input connector on the instrument.
4. Plug the detachable line cord in the AC adapter and plug the line cord into the wall receptacle.



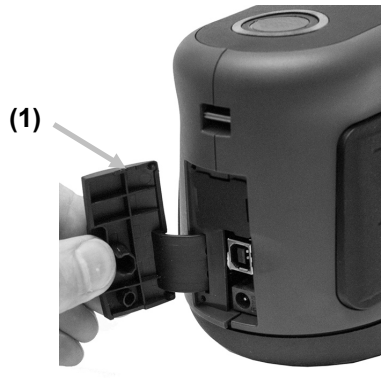
AC Adapter Ratings
Input: 100-240V 50-60 Hz
Output: 12VDC @ 2.5A

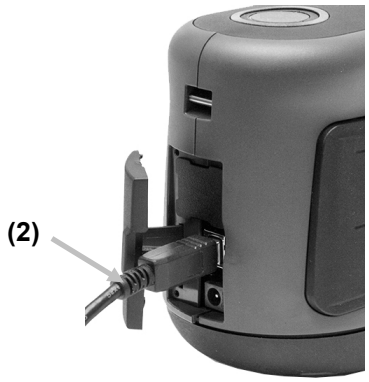
Operational hazard exists if an AC adapter other than X-Rite P/N SE30-277 is used.

Connecting the USB Cable

IMPORTANT: You must install the software before connecting the instrument to your computer.

1. Install the software application if not already installed. Refer to the software documentation for additional information.
2. Open the access cover (1) at the back of the instrument.
3. Turn the instrument on and plug the square end of the USB cable into the back of the instrument.
4. Plug the USB cable into an available port on your computer. A USB symbol appears on the screen when the USB connection is established.





IMPORTANT:

Never unplug the USB cable when data is being transferred.

It is recommended that the AC adapter be connected before a data transfer.

Attaching the Safety Strap

If you safety strap is not already attached to your instrument, follow the procedure below. The strap should not be used to carry the instrument.

1. Feed the small looped end (1) of the strap around the post at the back of the instrument.
2. Insert the wrist strap end (2) through the small loop.

3. Pull on the wrist strap to secure to the strap post.
4. Use the slide (3) to tighten the strap around your wrist.

USER INTERFACE

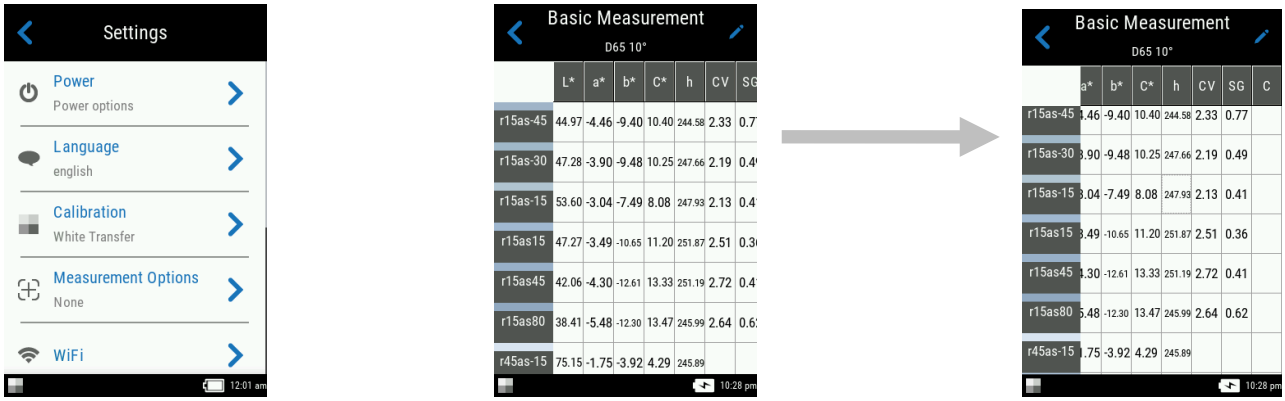
Navigating the Screen

The instrument features a graphical touch screen display. All functionality is accessed directly through the screen.

Scrolling through Settings and Data

Swipe the screen up/down or left/right to view the additional settings and data.

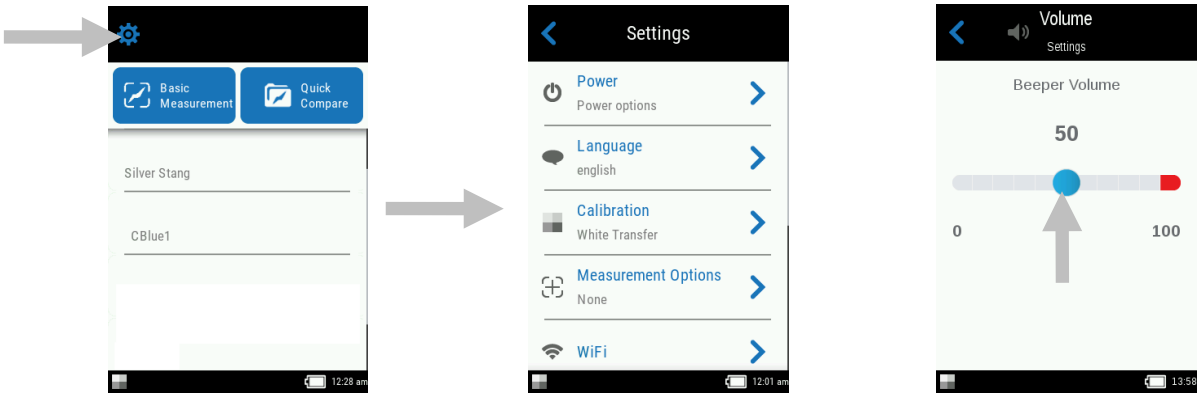
The back icon at the top of the screen is used to return the screen to the previous view.



Opening Settings and Jobs

Settings and jobs are accessed by tapping the corresponding icon on the screen. For this example, the Settings icon was tapped to open the Settings screen.

For setting controls that navigate from side to side, slide the dot icon to the right or left to change the parameter. The Volume option is shown below.



Measure Buttons

The instrument incorporates three measure buttons. One measure button (1) is located on the top of the instrument. This is the same button that is used to power on and off the instrument. The other two buttons are located on the left (2) and right (3) sides of the instrument. You can also tap the center of the screen to initiate a measurement.

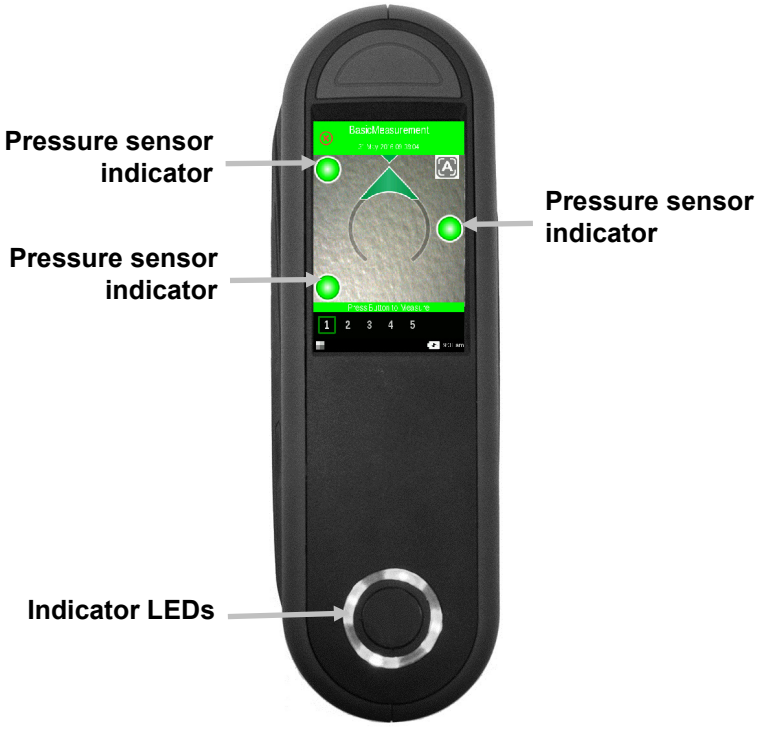
Pressure Sensors, Indicators and LEDs

To aid in proper positioning and ensure repeatability of sample measurements, the instrument incorporates three pressure sensors that are arranged around the measurement port. These sensors require an even amount of pressure to be applied across all three sensors before a measurement is triggered.

Three pressure sensor indicators that appear in the screen as well as the indicator LEDs on the top of the instrument provide positioning feedback. The indicators in the screen are arranged in the same pattern (top, back and side) as the pressure sensors located around the measurement port.

Pressure Sensor Indicators

- **Green Indicator:** ideal pressure is being applied to the corresponding sensor. A measurement can be taken when all three indicators illuminate green. If the required pressure is not maintained for the duration of the measurement, an error message will appear on the display and the measurement must be retaken.
- **Red Indicator:** the required pressure is not being applied to the corresponding sensor. Correct pressure must be applied to achieve a green indicator condition.



Indicator LEDs

The circular multi-color LEDs located on the top of instrument provides visual feedback on the status of a measurement and pressure sensors.

Instrument off

- Off: Indicates the instrument is turned off.

Booting

- White LED: Indicates the instrument is powered and booting up.

Idle mode

- Off: Indicates the instrument is in battery mode.
- White LED: Indicates the instrument is powered by the AC adapter.

Targeting mode

- Green LED: Indicates all three pressure sensors are activated properly and a measurement can now be triggered.
- Red LED: Indicates one or more of the pressure sensors is not properly activated.

Measurement mode

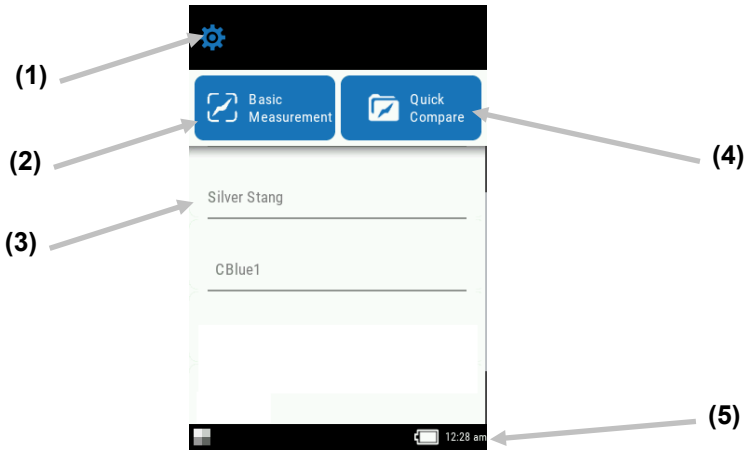
- Amber LED: Indicates that a measurement is taking place and the instrument must be held steady.
- Red LED: Indicates an error has occurred during a measurement (usually the instrument was moved).

Calculation mode

- Green LED: Indicates that the measurements have been acquired successfully and the instrument can now be moved.

Main Screen

When the instrument is powered-up, the main (top level) screen appears after the diagnostics test is complete. The main screen consists of the footer bar and operation modes. Select the modes by tapping the icons located on the display screen.



Settings Mode (1)

The settings mode is used to set and edit the instruments configuration options, and to enter the calibration mode. The settings options should be reviewed before you use your instrument for the first time. Refer to the Settings Mode section for information.

Basic Measurement (2)

This mode is used to take quick measurements with no standard comparison. Measurement data can be viewed and delete as needed. Refer to Basic Measurement section for more information.

Job Templates (3)

This area lists the current job templates downloaded from the application. Refer to Using Job Templates section for more information.

Quick Compare (4)

This mode is used to create standards or select standards from a library and compare sample measurement. Jobs can also be viewed and downloaded from this mode. Refer to Quick Compare Mode section for more information.

Footer Bar (5)

Displays the calibration status, Wi-Fi connection (where applicable), battery life status, and current time.

- **Calibration Status:**

   Indicates that calibration is currently not required.

   Indicates that calibration is required. Refer to Calibration Mode section for information on calibrating the instrument.

- **Wi-Fi Connection:**

   The Wi-Fi icon appears when the option is activated. Refer to Setting Mode for information on activating.

- **Battery Gauge**: Depicts the current condition of the battery pack.

   Indicates the battery pack is fully charged.

   Indicates the battery pack has a sufficient charge for a substantial number of measurements.

   Indicates the battery pack is low, but measurements are still possible. Battery pack should be charged soon.

   Indicates the AC adapter is plugged in and the battery pack is charging.

   Indicates the AC adapter is plugged in and no battery pack is installed.

- **Timestamp** - Displays the current time of day.

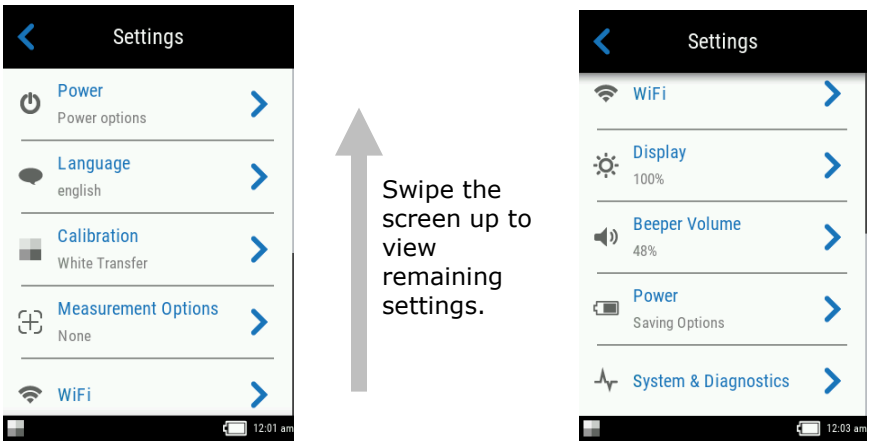
SETTINGS MODE

Settings mode is used to adjust and view the instrument's settings. You should review the current settings before using the instrument for the first time. However, you can go back and change these settings at any time.

Entering Settings Mode

1. From the Main screen, tap the **Settings** icon to access the Setting screen.

2. Tap the Settings option you want to edit or activate.



3. Refer below for information on configuring each Settings option.
4. When finished with the options, tap the Back icon  to return to the Settings screen.

Exiting Settings Mode

After configuring settings, tap the Back icon  at the top of the screen to exit the Settings screen and return to the main screen.

Power

This option is used to access the power options. The available options are Reboot and Power shutdown.

To access, tap **Power** and then tap the desired option. Tap option again to confirm.

Reboot: This option reboots the instrument.

Power: This option turns the instrument off.

Language


This option is used to set the language that is displayed on the instrument during operation.

To set the language, tap **Language** and then tap the desired language. A check mark appears next to the selected language.

Calibration


This option is used to activate the calibration procedure.

To access, tap **Calibration.** Refer to the Calibration mode section later in this manual for detailed information on performing a calibration.

Measurement Options


This option is used to set auto measurement mode and measurement averaging.

Auto Measure: When set to On, this option allows the instrument to automatically take a measurement once all three pressure sensor indicators turn green in the display. No measurement switch press or screen tap is required. Once a measurement is taken, the instrument must be repositioned in order for another measurement to occur.


This icon appears on the targeting screen when Auto is set.

Measure Modes: If available, this option is used to set the number of measurements required for calculating a single measurement. Measurements are taken at different locations on a sample to achieve average measurement values. The available settings are No Average (default), Average 3, Average 5, and SMC n:m.

SMC n:m (Statistical Measurement Control) is a method of performing a statistical analysis of several measurements to determine the quality of the measurements and/or the sample, before an average value is calculated. A statistical analysis of the measurements' mean and standard deviations eliminates outliers and determines the variability of the measurements. The number of required measurements (3 to 15) is set along with the maximum number of measurements (3 to 15) that can be taken to achieve an average value.

To access, tap **Measurement Options** and then tap No Average (default), Average 3, Average 5, or SMC n:m. When selecting SMC n:m, you will also need to set the number of good measurements required and maximum measurements. Slide the dot icons to the right or left to increase or decrease the measurement numbers.

Wi-Fi


This option is used to view all available networks when activated in Nucleos Auto QC.

Display

 This option is used to set the display screen brightness.

To set, tap **Display** and then slide the dot icon to the right or left to increase or decrease the brightness of the screen. The setting can range from 1 to 100.

Beeper Volume

 This option is used to adjust the volume of the instrument speaker. The instrument beeps when the screen is tapped, after a measurement, and after a calibration.

To set, tap **Beeper Volume** and then slide the dot icon to the right or left to increase or decrease the volume. The setting can range from 0 to 100.

Power Savings Options

 This option is used to set the desired power savings levels for the instrument to conserve battery life during nonuse times.

Dim Display: The instrument is ready to measure, however the display is not on. A button press or screen tap will wake up the instrument. Dim Display can be set from 10 to 119 seconds or N/A (off).

Standby Mode: The instrument is in power save mode. A button press or screen tap will wake up the instrument and will take 4 seconds before it is ready for use. Standby Mode can be set from 1 to 119 minutes or N/A (off).

Power Off: The instrument is in power off mode. The power button must be pressed to turn on the instrument and will take 20 seconds before it is ready for use. Power Off can be set from 1 to 119 minutes or N/A (off).

To set, tap **Power Savings Options** and then slide the dot icon to the right or left to increase or decrease the time of the desired option.

System & Diagnostics

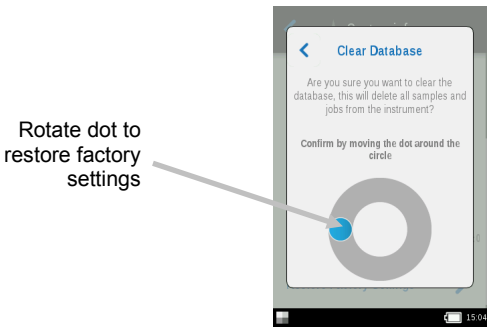
 This option is used to view instrument parameters, legal information, and open source information. Factory default setting can also be restored from this screen.

System Info: Tap this option to access the following options.

Restore Factory Settings

Note: This option deletes all existing jobs and samples, and reset the instrument to its default state.

To restore defaults, tap **Restore Factory Settings** and rotate the dot icon around the circle in the middle of the screen.



Open Source

This X-Rite product includes software code developed by third parties. This option displays the open source information.

Memory: Tap this option to display memory used and the number of samples stored. All stored jobs and samples can also be cleared from this screen.

Clear Database

Note: This action will delete all samples from the instrument.

To clear jobs and samples, tap **Clear Database** and rotate the dot icon around the circle in the middle of the screen (see screen image above).

Legal Information

This option displays the instrument's compliance information.

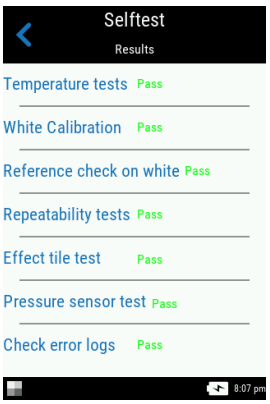
Self test

This option is used to conduct various performance tests on the instrument. The test can take several minutes to complete.

Refer to the Calibration Mode section for additional information on positioning the instrument on the calibration reference.

To perform this test:

1. Measure the white calibration tile.
2. Measure the effects tile.
3. Measure open air (instrument not on a surface).
4. View test results.



CALIBRATION MODE

The instrument includes an integrated calibration tile on the inside of the measurement port cover, which is used to automatically perform a calibration before each measurement. However, every 30 days a white tile calibration and effect tile check must be performed utilizing the included calibration reference.

The calibration icon at the bottom of the screen changes to this icon indicating that a calibration must be performed. No measurements can be taken until the calibration is completed.

Refer to the Cleaning section in the Appendices for information on cleaning the calibration reference.

NOTE: Make sure to use the calibration reference supplied with the instrument for calibrating. Do not substitute this reference with a reference from another instrument. The serial number on the reference should match the reference serial number displayed on the instrument screen during calibration.

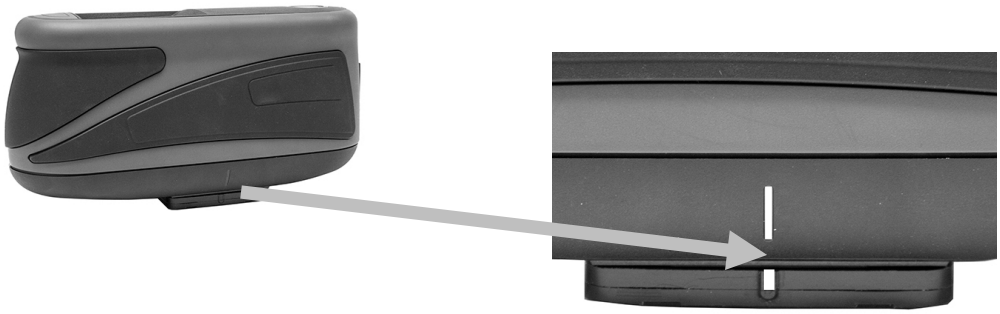
Calibration Notes

- The **white tile in the calibration reference is dramatically affected by smudge marks, dust, and finger prints**. Refer to Appendices for calibration reference cleaning procedures.
- **Do not move instrument while taking a calibration measurement**. If motion is detected, an error message will be displayed and calibration aborted.

Positioning the Instrument on the Calibration Reference

The calibration reference is designed to keep the white tile and effect tile free of dust and debris.

Lay the calibration reference flat. Position the instrument on the calibration reference over the tile so that the three pressure sensors around the measurement port align with the slots in the calibration reference, and the white lines align. This ensures the instrument is properly positioned over the white tile or effects tile.



Calibrating the Instrument

1. Select the calibration option from the Settings menu as previously explained (see Entering Settings Mode).

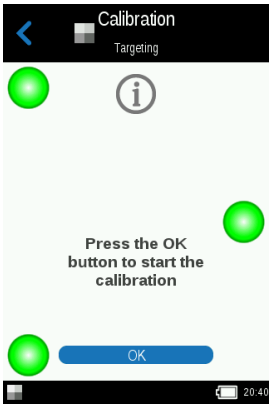
   The message "Calibration Required" appears if the instrument needs to be calibrated. If calibration is not currently needed, the time remaining before the next calibration appears. To exit the calibration mode without calibrating, tap **Ignore**.

2. Tap **Calibrate** to continue with the calibration.

   Position the instrument on the white tile as previously explained. Swipe the screen to the left for additional information on positioning.

3. When ready, tap the Calibrate icon  in the screen.

4. Make sure all three positioning indicators in the screen are green and then tap the **OK** button. Do not touch the instrument throughout the measurement sequence.



   NOTE: If an error message appears after white calibration, try measuring the white tile again. If an error still occurs, clean the white calibration tile as explained in the Appendices.

5. After calibration is completed, tap **OK** in the screen and remove the instrument from the white tile and position it over the effects tile as previously explained. Press the top **Measure** button or tap the Calibrate icon  in the screen. Do not touch the instrument throughout the measurement sequence.

6. After reference verification is completed, remove the instrument from the calibration reference and return the reference to its storage location.

OPERATION

The section explains instrument positioning techniques, Basic Measurement, Quick Compare, and running jobs from Job Templates.

Instrument Positioning

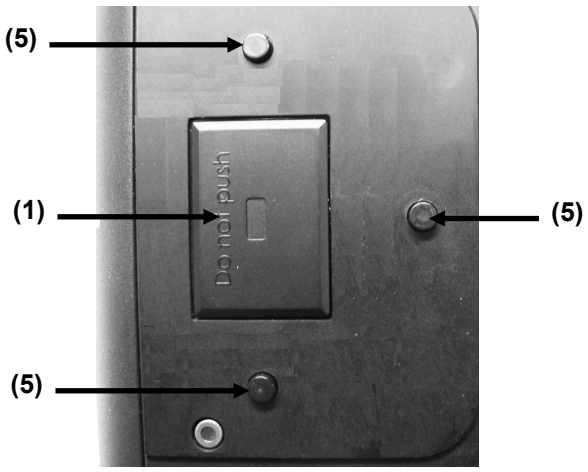
In order for the instrument to obtain accurate and repeatable measurements, the bottom of the measurement port must be flat with the sample surface to be measured. Any movement of the instrument can cause the measurement angles to vary, greatly affecting measurements on metallic and pearlescent paint finishes. The pressure sensors ensure the integrity of the measurement data.

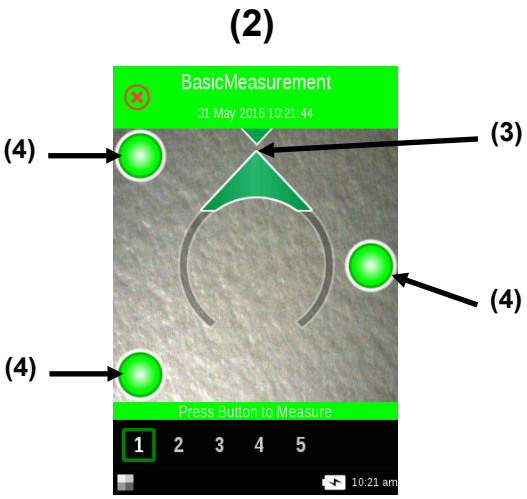
Below is an example of how to position the instrument correctly to perform measurements. Refer to the Basic Measurement, Quick Compare Mode, and Using Job Templates sections that follow for information on starting a measurement sequence.

1. Initiate a measurement on the instrument to activate the targeting mode. Targeting enables you to view the sample through the screen for accurate positioning.
2. Using both hands, rotate the instrument to a vertically aligned position with the top Measure button up. Locate the measurement port (1) in the bottom of the instrument over the sample while viewing the screen (2). The large alignment arrow in the center of the screen should turn green and be aligned with the small green arrow at the top of the screen (3).

   When not properly aligned, the large alignment arrow turns red and indicates the angle discrepancy. In this case, simply rotate the instrument until both arrows (3) are aligned and shown as green.

   NOTE: Targeting mode is automatically exited if a measurement is not taken within 30 seconds of activation.





3. Gently rock instrument until all three positioning indicators (4) in the display screen turn green. This indicates that all three pressure sensors (5) are activated and a measurement can be taken.
4. Refer to the Basic Measurement, Quick Compare Mode, and Using Job Templates sections that follow.

Additional Tips

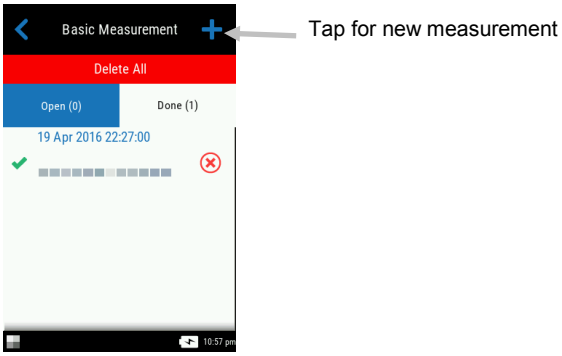
- Measurements performed on a surface with a curve can cause measurement errors especially at the near specular angles (±15° and 25°). Measurements should be made on the flattest part of a sample whenever possible.
- Hold the instrument firmly by the front and top during a measurement.

Basic Measurement

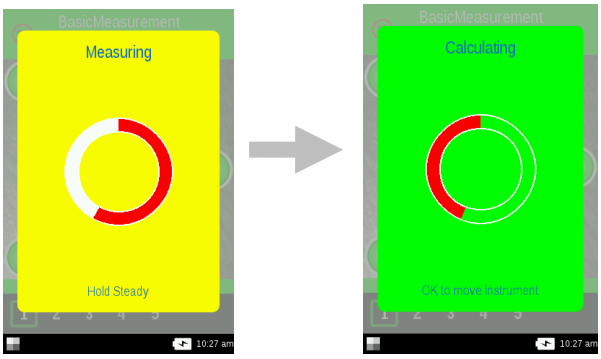
The Basic Measurement mode is used to take quick measurements with no standard comparison. Measurement data can be viewed and delete as needed. The measurement sequence is displayed at the bottom of the screen to help you track your progress for a sample.

The following procedures explain the steps for operating the instrument in Basic Measurement mode.

1. From the main screen, tap **Basic Measurement**.
2. Tap the Plus icon + at the top of the screen to start a new measurement.



3. The instrument goes into targeting mode. Position the instrument on the first sample area to measure as explained in Instrument Positioning.
4. Hold the instrument steady and press a **Measure** button or tap the screen to initiate a measurement. The measurement will automatically occur if Auto Measurements is activated. Continue to hold the instrument steady until "Calculating" appears in the screen.



NOTES:

- If an error occurs after the measurement, tap **OK** on the screen and try measuring again.
- The current measurement sequence can be canceled at any time by tapping the Cancel icon ⊗ at the top left of the screen and then tapping **yes**.

The bottom of the screen now shows the first measurement as completed and asks you to take the second measurement. If SMC is activated, the screen shows the current number of measurements averaged so far.

OR

5. Position the instrument on the second sample area as explained in Instrument Positioning. Hold the instrument steady and press a **Measure** button or tap the screen.

6. Continue with the remaining sample area measurements as needed.

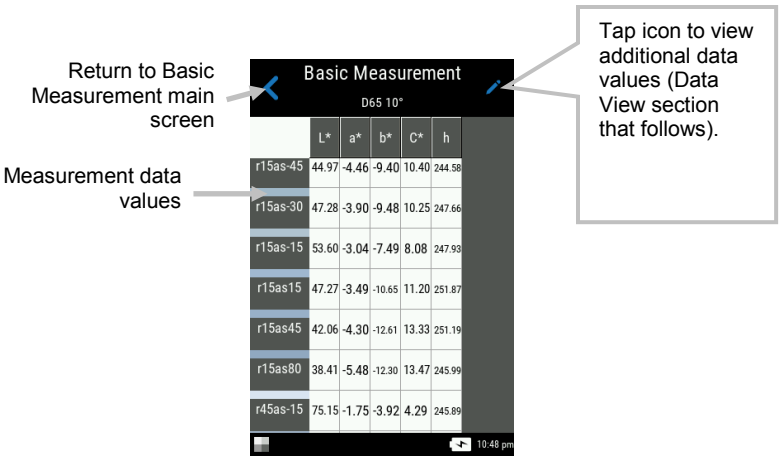
7. After the last measurement for the sample is completed, the measurement data screen appears. Refer to the sections that follow for information on viewing data and deleting sample measurements.

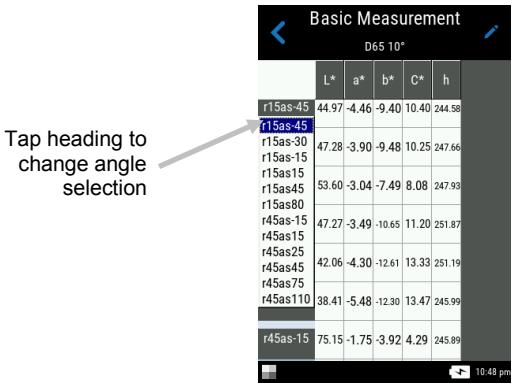
8. When completed viewing data, tap the Back icon on the screen to return to the main Basic Measurement screen.

Viewing Measurement Data

L*a*b*C*h° data for all measurement angles and texture data (CV, SG, and C) can be viewed.

The data screen appears after all measurements for the sample are completed. Swipe the screen left to view the additional measurement data. You can also tap the angle heading bar to change the angle data for the selected column.



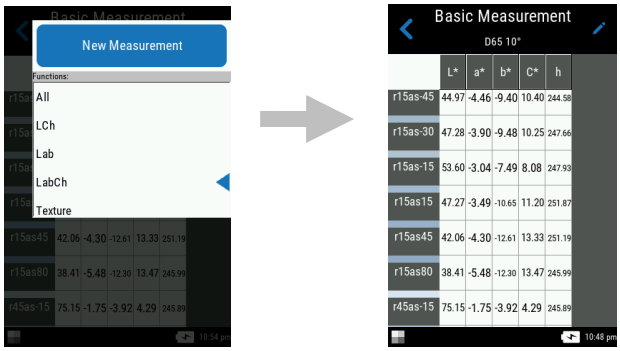


Data View

LCh, Lab, LabCh and Texture data views can be selected in this function. The view selected will remain as the default view until changed.

1. Tap the edit icon to access the Functions screen.

2. Tap the desired function to view the data. The arrow icon indicates the currently selected data view.

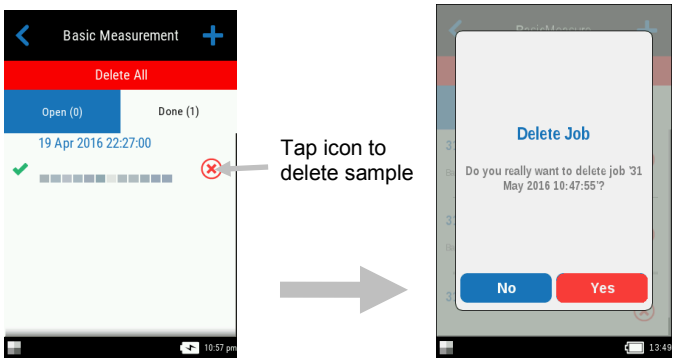


Deleting Basic Samples

You can delete individual sample or all samples at once from the Basic Measurement Done list at the main screen.

Single Sample

1. To delete a single sample, tap the delete icon next to the sample you want to delete from the Done list. You need to swipe the screen up or down if the sample you want to delete is not showing up in the list.
2. A message appears asking you to confirm that you want to delete the sample. Tap **Yes** to confirm or **No** to return to the Basic Measurement main screen.



NOTE: Tapping the sample name instead of the delete icon opens the data view screen.

All Samples

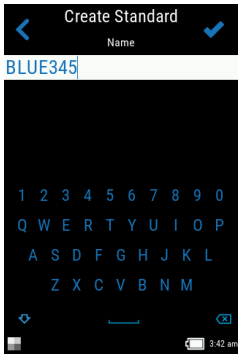
1. To delete all sample from the Done list, tap **Delete All**.
2. A message appears asking you to confirm that you want to delete all sample. Tap **Yes** to confirm or **No** to return to the Basic Measurement main screen.

Quick Compare Mode

The Quick Compare mode is used to compare standards with measured samples. Standards are either downloaded from the software application or created on the instrument. Absolute or difference measurement data can be viewed for all angles.

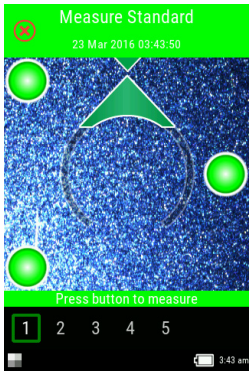
Creating Standards

1. From the main screen, tap **Quick Compare**.
2. Tap the Plus icon at the top of the screen.
3. Tap **Create Standard** and enter a standard name using the virtual keyboard. Tap the checkmark icon at the top of the screen to save the name.

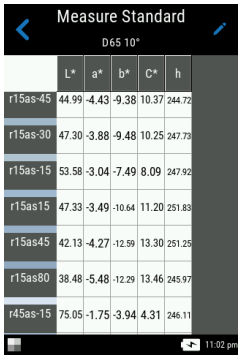


4. Tap the desired delta calculation from the list. **NOTE**: Delta calculations are downloaded from the software application. A green checkmark appears next to the selected delta calculation. Tap the checkmark icon at the top of the screen to enter the Measure Standard screen.

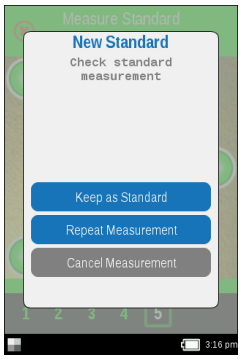
5. The instrument goes into targeting mode. Position the instrument on the standard area to measure as explained in Instrument Positioning.



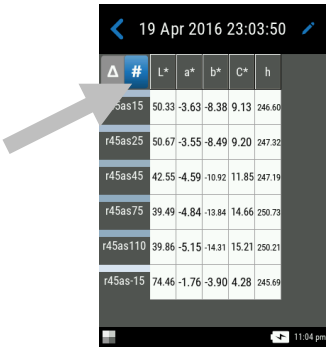
6. Hold the instrument steady and press a **Measure** button or tap the screen to initiate a measurement.
7. Continue with remaining measurements for the standard.
8. The standard data for all angles appears on the screen. If desired, tap the edit icon to access the Functions screen were other data can be viewed.
9. Tap the **Back** icon to access the New Standard screen.

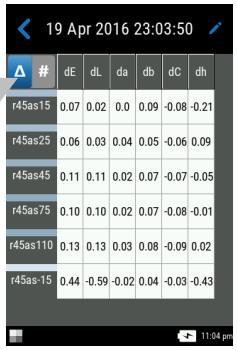


10. From this screen tap **Keep as Standard** to measure the sample. You can also tap **Repeat Measurement** to start over or tap **Cancel Measurement** to exit.



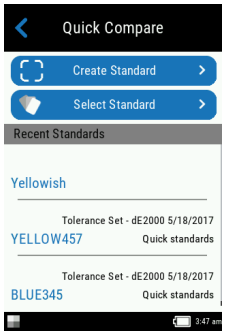
11. After Keep as Standard is tapped, the instrument goes into targeting mode. Position the instrument on the sample area to measure as explained in Instrument Positioning.
12. Hold the instrument steady and press a **Measure** button or tap the screen to initiate a measurement.
13. Continue with remaining measurements for the sample.
14. The sample data for all angles appears on the screen. If desired, tap the edit icon to access the Functions screen were other data can be viewed. Tap the **#** icon to view absolute data or tap the **Δ** icon to view difference data.





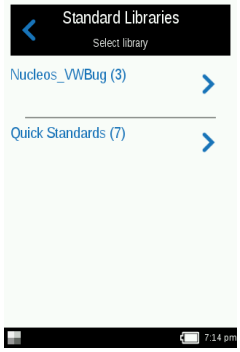
15. Tap the Back icon to return to the Quick Compare screen. Recently measured standards appear in the list.

    Standards in the Recent Standards list can be selected to perform additional sample measurements.

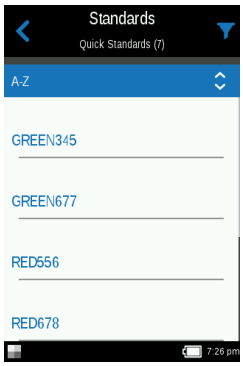


Selecting Standards

1. From the main screen, select **Quick Compare**.
2. Tap the Plus icon at the top of the screen.
3. Tap **Select Standard** and tap the library from the list where the standards are located. Each library displays the total number of standards available. The Quick Standards library contains standards that were created on the instrument. All other libraries listed are downloaded from the software application.



4. Select the desired standard from the list. The instrument goes into targeting mode. **NOTE**: If several standards exist in the selected library, you can refine your search by tapping the icon at the top of the screen and selecting Title, Description, Delta, or Hint as the a sort method. You can also tap the icon to change the sort direction.



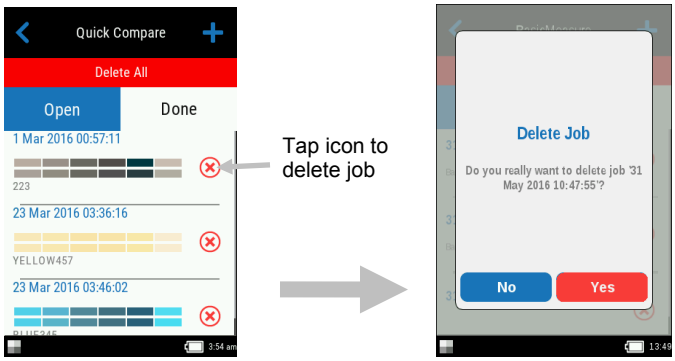
5. Position the instrument on the sample area to measure as explained in Instrument Positioning.
6. Hold the instrument steady and press a **Measure** button or tap the screen to initiate a measurement.
7. Continue with remaining measurements for the sample.
8. The sample data for all angles appears on the screen. If desired, tap the edit icon to access the Functions screen were other data can be viewed. Tap the **#** icon to view absolute data or tap the Δ icon to view difference data.
9. Tap the Back icon to return to the Quick Compare screen.

Deleting Quick Compare Jobs

You can delete individual jobs or all jobs at once from the Quick Compare list at the main screen.

Single Job

1. To delete a single job, tap the delete icon next to the job you want to delete from the Done list. You need to swipe the screen up or down if the job you want to delete is not showing up in the list.
2. A message appears asking you to confirm that you want to delete the job. Tap **Yes** to confirm or **No** to return to the Quick Compare main screen.



NOTE: Tapping the job name instead of the delete icon opens the data view screen.

All Jobs

1. To delete all jobs from the Done list, tap **Delete All**.
2. A message appears asking you to confirm that you want to delete all jobs. Tap **Yes** to confirm or **No** to return to the Quick Compare main screen.

Using Job Templates

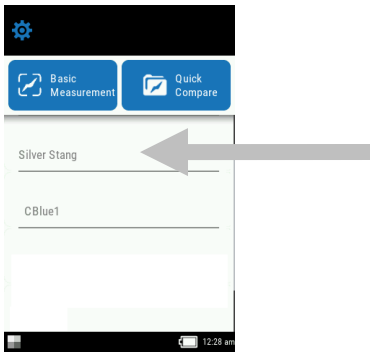
Job templates are created using a software application and then downloaded to the instrument.

Job templates can contain multiple jobs which each include standards, checkpoint titles, and tolerances. A typical job would display a list of checkpoints (measurements) required for the selected job. After all checkpoints are measured, the job data is uploaded to the software application for analysis.

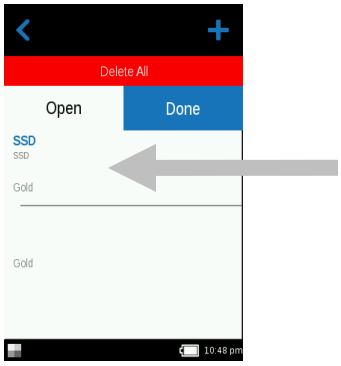
Refer to the software application for specific information on creating job templates, downloading job templates, and uploading job data.

Running a Job from a Job Template

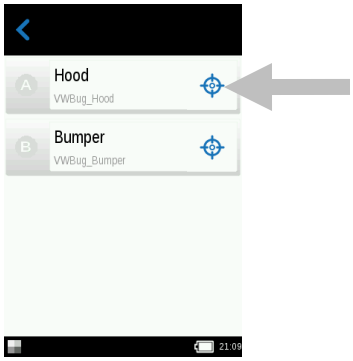
1. Send job template from Nucleos Auto QC to the instrument.
2. From the main screen, tap the job template from the list.



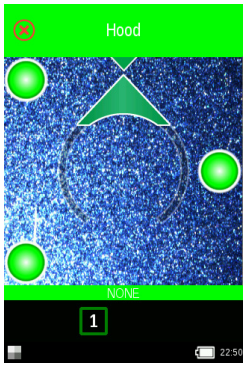
3. Jobs that are available in the selected job template are displayed in the Open list. Tap the job that you will be running.



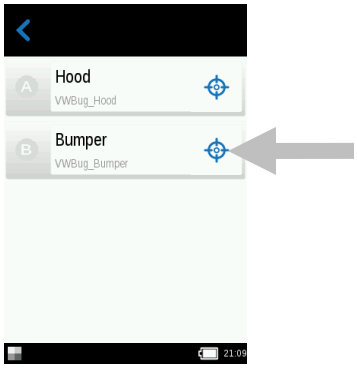
4. Measurement checkpoint information is displayed for the selected job. In this example, the hood and the bumper of the car are to be measured. Tap **Hood** in the checkpoint list to place the instrument into targeting mode.



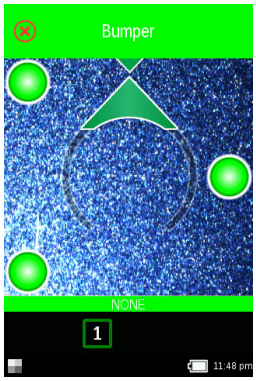
5. Position the instrument on the checkpoint to measure as explained in Instrument Positioning.



6. Hold the instrument steady and press a **Measure** button or tap the screen to initiate a measurement.
7. Continue with remaining areas of the checkpoint as required. After the checkpoint is finished the instrument returns the main job screen.
8. Tap **Bumper** in the checkpoint list to place the instrument into targeting mode.



9. Position the instrument on the checkpoint to measure as explained in Instrument Positioning.



10. Hold the instrument steady and press a **Measure** button or tap the screen to initiate a measurement.
11. Continue with remaining checkpoint measurements as required. After the checkpoint is finished the screen returns the main job screen.
12. Upload the job data to the software application for analysis.

APPENDICES

Service Information

X-Rite provides repair service to their customers. Because of the complexity of the circuitry, all warranty and non warranty repairs should be referred to an authorized service center. For non warranty repairs, the customer shall pay shipping and repair cost to the authorized service center, and the instrument shall be submitted in the original carton, as a complete unaltered unit, along with all the supplied accessories.

X-Rite, Incorporated has offices around the world. You can contact us using one of the following methods:

- To identify the X-Rite service center nearest you, please visit our web site at www.xrite.com and click the **Contact** link.
- For online help, visit our web site and click the **Support** link. Here you can search for software or firmware updates, white papers, or frequently asked questions which can quickly resolve many common user problems.
- Send an e-mail to Technical Support (casupport@xrite.com) detailing your problem and listing your contact information.
- For sales questions or to order cables and accessories, visit our web site or contact your nearest X-Rite dealer or service center.
- Problems and questions can also be emailed or faxed to your local X-Rite office listed on our website.

Cleaning the Instrument

Your instrument requires very little maintenance to achieve years of reliable operation. However, to protect your investment and maintain reading accuracy, a few simple-cleaning procedures should be performed from time to time.

General Cleaning

The exterior of the instrument may be wiped clean with a cloth dampened in water or mild cleaner.

NOTE: DO NOT use any solvents to the clean the instrument, this will cause damage to the cover and internal electronic components.

Cleaning the Calibration Reference

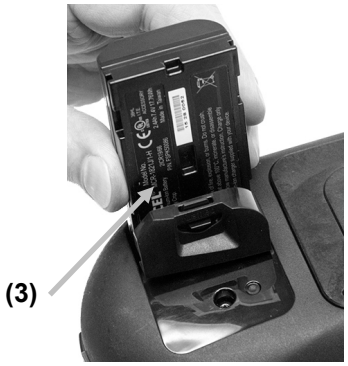
The white tile and effects tile in the calibration reference should be cleaned using a mild soap and warm water solution, thoroughly rinsed with warm water, and wiped dry with a clean, lint-free cloth. You must let the reference dry completely before taking a calibration measurement.

Replacing the Battery Pack

NOTE: If the battery pack is ever dropped, check it for damage and replace if necessary.

Use the rechargeable Li-ion batteries provided (X-Rite P/N SE15-40 / E-One Moli Energy Corp Model MCR-1821J/1-H); other types may burst causing personal injury.

1. Carefully turn the instrument over and slide open the latch (1) that secures the battery pack access cover. Open the access cover.
1. Press in on the battery pack holding latch (2) in the battery compartment to allow the battery to pop up.
2. Turn the instrument over to allow the old battery back to slide out.
3. Slide the new battery pack (3) into the instrument with the battery contacts facing down until the battery is positioned below the holding latch (2).
4. Close the access cover by pressing down until it locks into position.



Troubleshooting

Prior to contacting X-Rite support department for instrument problems, try the applicable solution(s) described below. If the condition persists, contact us using one of the methods listed in the Service Information section.

Problem	Cause	Solution
Instrument not responding.	Instrument is in power down mode.	Press the power button.
	Battery pack is very low or bad.	Charge the battery. If battery pack is bad, replace using the procedure in the Appendix.
	No battery pack installed.	Install batteries or plug in AC adapter.
		Reset the instrument. See Setting Mode.
Measurement error or results appear inaccurate.	Material being measured is damaged (e.g. scratched)	Obtain new material.
	Instrument requires calibration.	Refer to Calibration mode for procedure.
Calibration procedure fails.	Calibration reference is dirty or damaged.	Clean the reference per procedure in Appendix, or replace if damaged.
Instrument and software not communicating (USB connection).	Interface cable not connected.	Connect the interface cable between the computer and the instrument.
		Close and restart the software application. If this does not work, reboot the computer.
		Reset the instrument. See Settings Mode procedure.
Instrument will not measure or calibrate.	Sensor indicators in the display do not change color.	Pressure sensors are not working correctly. Put the instrument into targeting mode and place the instrument on a flat surface and then lift. If one or more of the sensor indicators in the display do not change color when lifted, there may be a problem with the pressure sensor. Contact technical support.

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