


Ci51/Ci52 Spectrophotometer



User Guide



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



Hereby, X-Rite, Incorporated, declares that this Ci5X Series is in compliance with the essential requirements and other relevant provisions of Directives 2014/35/EU (LVD), 2014/30/EU (EMC), and RoHS 2011/65/EU.

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.

Industry Canada Compliance Statement

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

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Equipment Information



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

WARNING: This instrument is not for use in explosive environments.

Do not look directly into the measurement optics when the instrument is on.



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

Proprietary Notice

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Patents: www.xrite.com/ip

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Warranty Information

X-Rite, Incorporated (“X-Rite”) warrants each instrument manufactured to be free of defects in material and workmanship for a period of 12 months*. This warranty shall be fulfilled by the repair or replacement, at the option of X-Rite, of any part or parts, free of charge including labor, F.O.B. its factory or authorized service center.

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.

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INTRODUCTION AND SETUP

The spectrophotometer is a compact, rugged and reliable color measurement instrument that reports spectral data to a computer.

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



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.

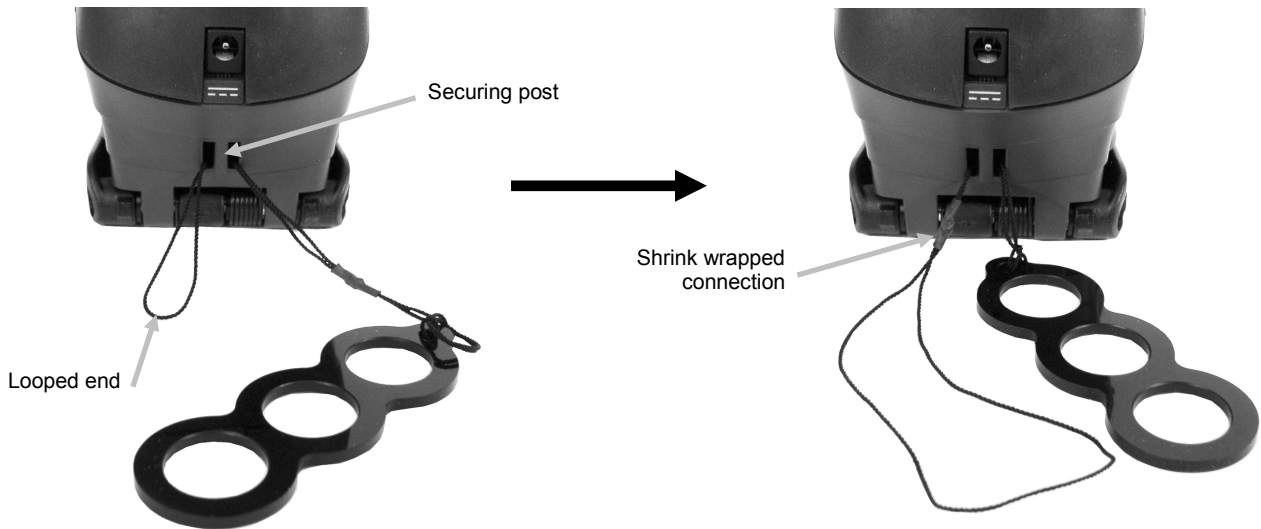
- Ci51 or Ci52 instrument
- USB interface cabling
- AC adapter (X-Rite P/N SE30-277) and line cord
- Cord strain relief with strap
- Calibration reference
- Manuals & utilities CD
- Documentation and registration material

Attaching the Cord Strain Relief

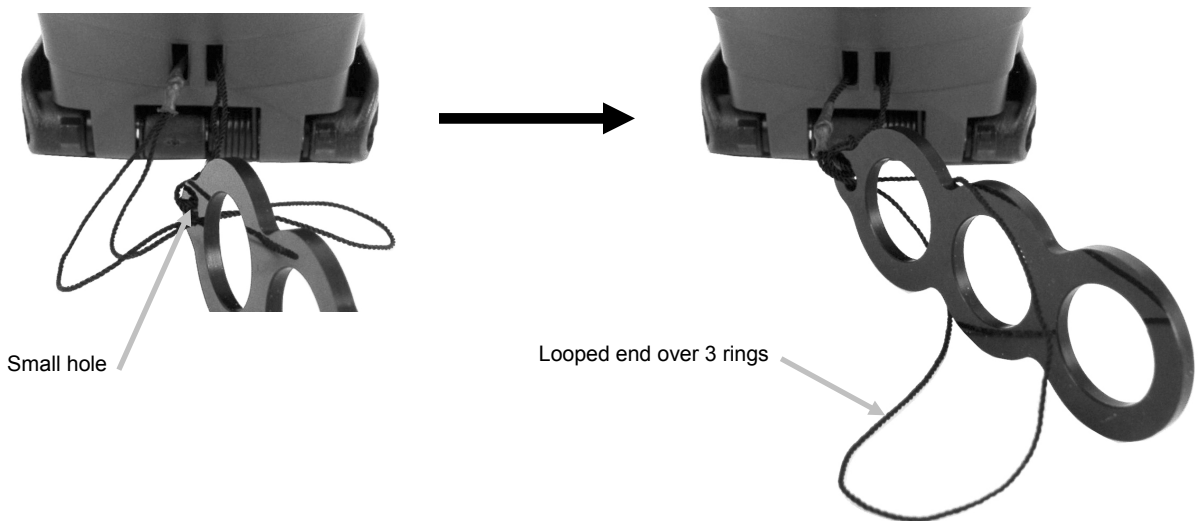
A cord strain relief and strap is supplied to help prevent inadvertent cord disconnection during instrument use.



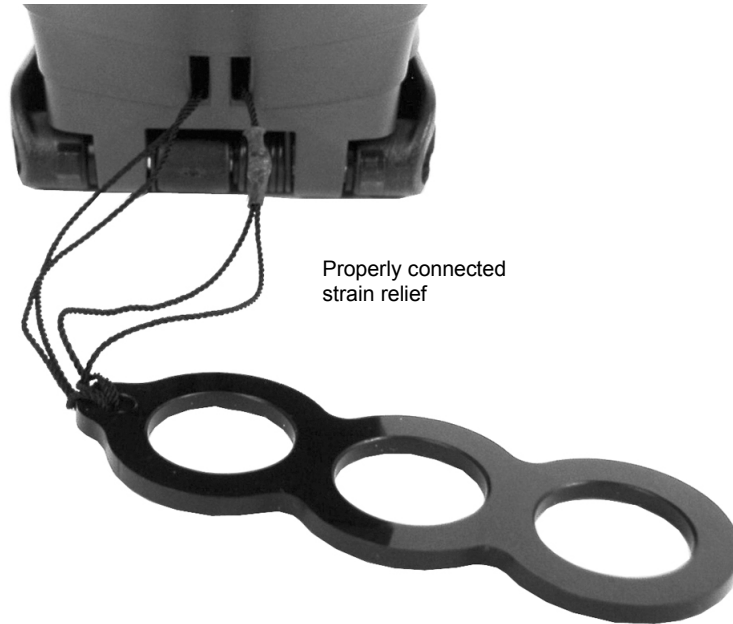
1. Attach the strap to the strain relief by inserting one of the looped ends into the small hole, and then through the other looped end to tighten.
2. Insert the looped end of the strain relief strap into one side of the post at the back of the instrument, and then out the other side. Note: You may need to use a small pointed object to pull the loop around the post.
3. Continue pulling the looped end of the strap until the thicker shrink wrapped connection in the middle passes around the post.



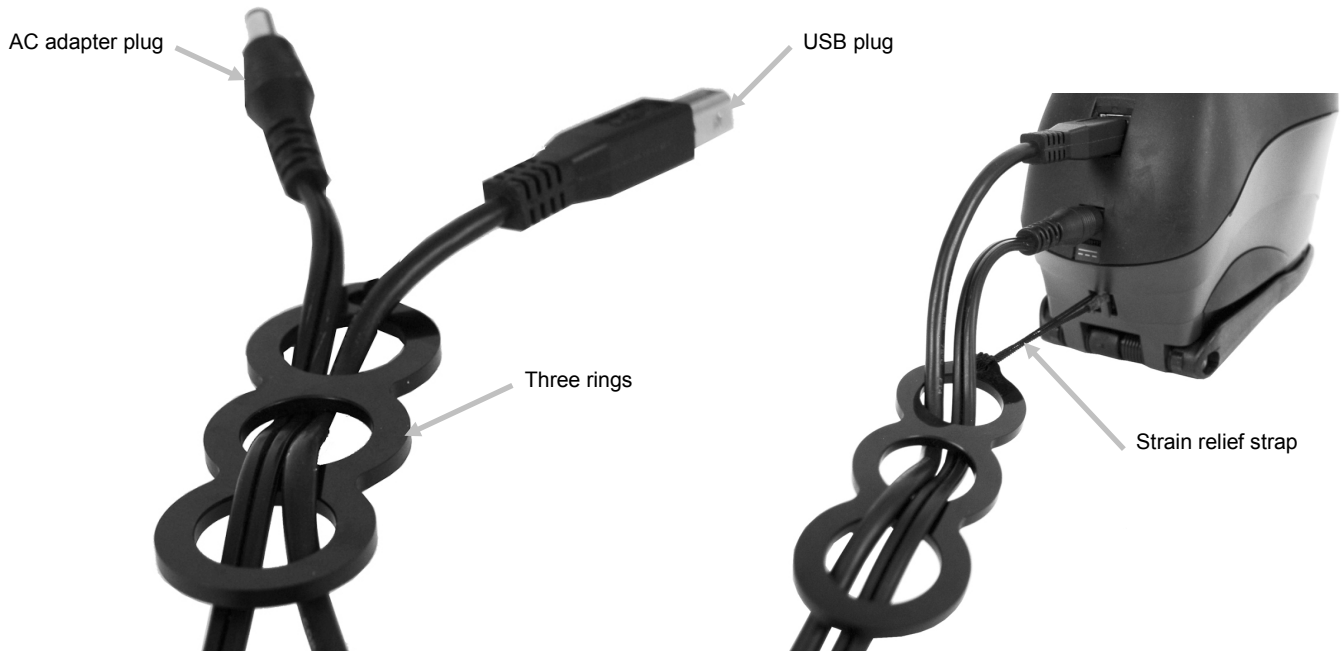
4. Next, insert the looped end of the strap through the small hole in the strain relief, and then pass it over the 3 rings of the strain relief back towards the small hole.



5. Pull the strain relief away from the instrument, allowing the looped end to tighten around the small hole. The shrink wrapped connection in the middle of the strap needs to pass back around the post. The strap should now be doubled, making it half of its original length.



6. Feed the AC adapter plug and USB plug through the 3 rings of the strain relief.
7. Pull the cords through the 3 rings until there is some slack in the cords when they are plugged in, and when the strain relief strap is pulled tight.



Connecting the AC Adapter

1. Verify the voltage indicated on the AC adapter complies with the AC line voltage in your area.
2. Insert the small plug from the AC adapter into the input connector on the instrument.
3. 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 SE30-277 is used.

Connecting the USB Cable

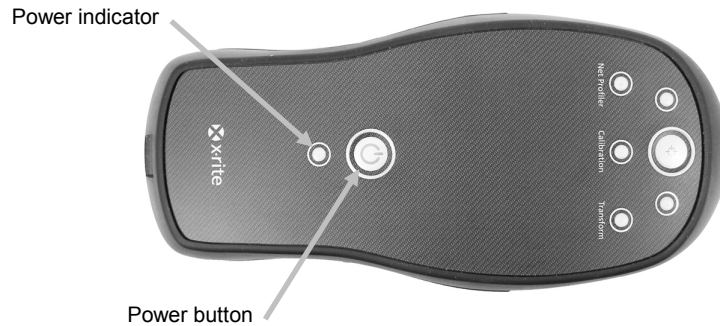
IMPORTANT: You must install the instrument driver before connecting the instrument to your computer.

1. Install the software application if not already installed. Refer to the software documentation for additional information.
2. Plug the square end of the USB cable into the back of the instrument.
3. Plug the USB cable into an available port on your computer.



Power Button

The power button can be used to wake the instrument after it goes into a power down state. A power on condition is designated by a solid green power indicator. Simply press the power button to wake the instrument. A power down state occurs after five minutes of non use, and is designated by a flashing green power indicator.



Instrument Indicators

The LED indicators convey a variety of instrument conditions, such as calibration status, measurement status, etc. Below is description for each color displayed by the instrument indicators during operation.

Measurement

- *Solid Amber:* Measurement in progress
- *Solid Green:* Successful measurement was taken
- *Solid Red:* Measurement failed

Calibration

- *Solid Red:* Calibration is required
- *Solid Green:* Calibration is not required at this time

NetProfiler

- *Indicator Off:* NetProfiler feature is not enabled
- *Solid Green:* NetProfiler subscription is currently activated
- *Solid Amber:* The profile has expired and updating is required

Transform

- *Indicator Off:* Transform feature is not enabled
- *Solid Green:* Transform feature is activated

CALIBRATING

The software application prompts for an instrument calibration when required. The frequency at which this occurs depends on the application. Refer below for procedure.

The calibration reference consists of a ceramic disk for white calibration measurements, and a trap opening for black calibration measurements. The instrument shoe fits snugly in both positions.

Refer to Cleaning section in the Appendices for information on cleaning the optics area and references.

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 (plaque) serial number on the instrument.

Calibration Notes

- Dirt or dust in the aperture area will cause an inaccurate calibration reading. Refer to the Appendices for optics cleaning procedure.
- **The white ceramic plaque in the calibration reference is dramatically affected by smudge marks, dust, and finger prints.** Refer to Appendices for calibration reference cleaning procedures.
- **The black trap should be cleaned periodically to remove any dust or contamination.** Refer to Appendices for black trap cleaning procedures.
- **Do not release the instrument while taking a calibration measurement.** If the instrument is released, calibration will be aborted.

Calibration Procedure

1. When a calibration is prompted for by the application, select the appropriate option to initiate the calibration.
2. Remove the protective cap from the white ceramic plaque in the calibration reference.
3. Position the instrument's target window over the white ceramic plaque.



4. Press the instrument firmly to the shoe. Hold steady until the measurement status indicators change to amber and then green. The calibration indicator should change to red.
5. Release the instrument.
6. Reinstall the protective cap on the white ceramic plaque.
7. Position the instrument target window over the black trap opening in the calibration reference.



8. Press the instrument firmly to the shoe. Hold steady until the measurement indicators change to amber and then green, and the calibration indicator changes to green. This is an indication that the calibration procedure was successful.
9. Release the instrument.
10. Store the calibration reference in a dry, dust free area, away from direct exposure to light.

TAKING MEASUREMENTS

You should refer to the documentation for the software program that you are using with your instrument. All applications that use the instrument must be running during measurements.

Sample Criteria

The instrument can take measures from just about any clean, dry surface that is reasonably flat. The instrument shoe should be able to rest flat and steady on the sample area. If the item to be measured is smaller than the shoe, you may want to make a platform—at the same height as the item—for the rest of the instrument's shoe to sit on.

NOTE: Never measure wet paint. Wet paint will contaminate the instrument.

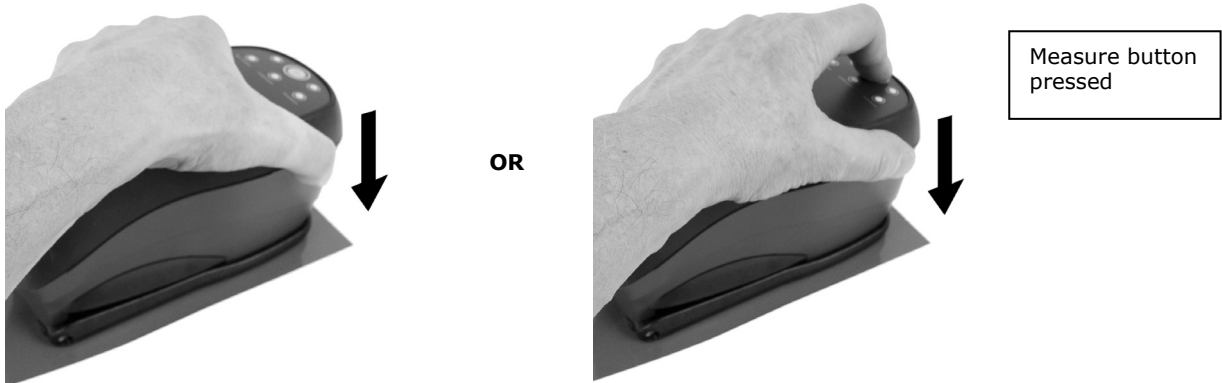
Measurement Techniques

1. Clear the sample surface of any dirt, dust, or moisture.
2. Position the target window over the sample to measure. If possible, place the entire instrument on the sample.



3. Press the instrument firmly to the shoe; the measurement indicators change to amber. Hold steady until the measurement indicators change to green followed by an audible beep. This is an indication that the measurement was successful.

NOTE: Your application may also require you to press the Measure button during a measurement.



4. Release the instrument.

The measurement indicators change to red and an error beep occurs if the measurement was unsuccessful. Refer to the Troubleshooting section in the Appendices for more details.

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 Us** link.
- For online help, visit our web site (www.xrite.com) 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 (www.xrite.com) or contact your nearest X-Rite dealer or service center.
- Problems and questions can also be faxed to your local X-Rite office listed on our web site.

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 clean the instrument, this will cause damage to the cover.

Cleaning the Optics

The optics should be cleaned once a week in a normal environment. If the instrument is used in a dirty or dusty environment, more frequent cleaning may be required.

Carefully lift the instrument, open the shoe and blow short bursts of clean, dry air into the measurement port. This should remove any accumulated debris from the optics.



IMPORTANT: If can air is used for cleaning, do not invert or tilt the can during use. This could cause damage to the optics.

Cleaning the Calibration Reference

The calibration reference consists of a white ceramic plaque and a green ceramic plaque (if equipped), and a black trap opening.

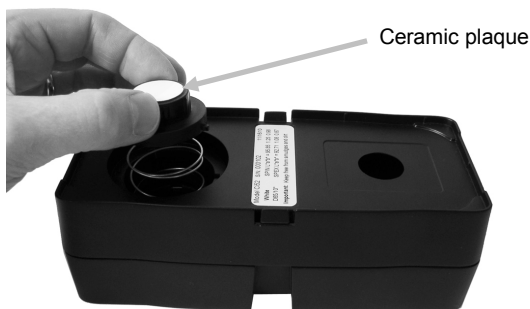
The calibration reference should be cleaned periodically.

Ceramic Plaque Cleaning Procedure

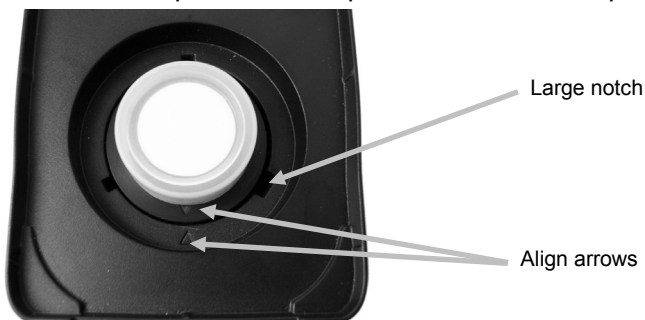
1. Remove the protective plastic cap from the ceramic plaque.



2. **Important:** Always grip the ceramic plaque from the edges, being careful not to touch the white/green surface. Press downward on the ceramic plaque and turn counterclockwise until it stops. Lift upward and remove the ceramic plaque from the base.



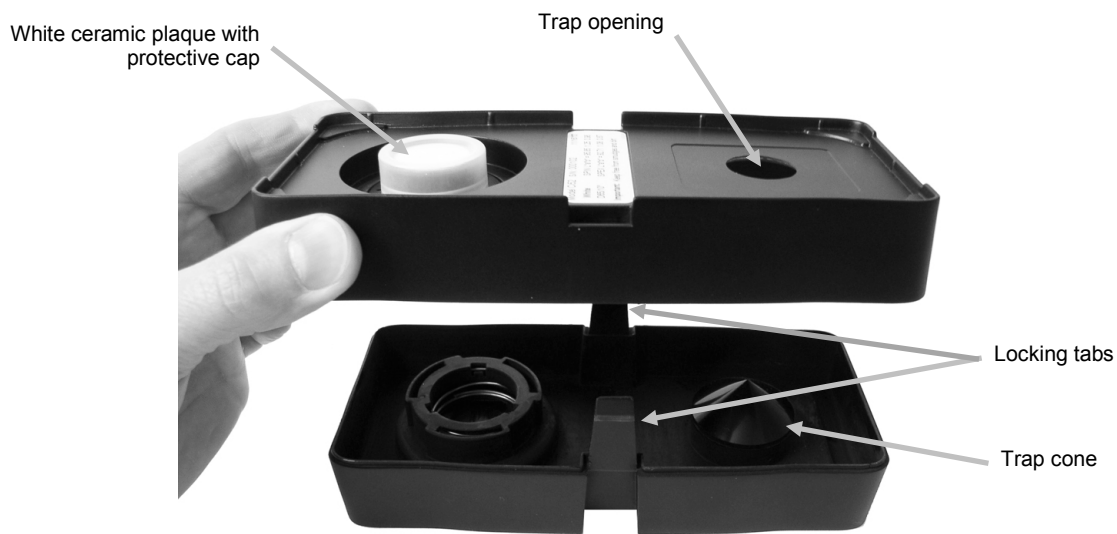
3. Clean the plaque using a mild soap and warm water solution. Thoroughly rinse with warm water and wipe dry with a lint-free cloth. Do not use solvents or cleaners of any kind.
4. After the ceramic plaque is completely dry, align the large tab on the side of the ceramic plaque with the large notch in the base. Compress the spring downward with the ceramic plaque until it stops. Holding the ceramic plaque down, rotate clockwise until it stops. Slowly allow the plaque to rise. The arrow on the ceramic plaque and the arrow on the base should be aligned when properly positioned.
5. Reinstall the protective cap over the ceramic plaque when not in use.



Black Trap Cleaning Procedure

1. Take apart the two sections by compressing the two locking tabs on both sides with your fingers and separating.
2. Clean with clean, dry air, or wipe clean with a lint-free cloth to remove any dust or contamination.
3. After cleaning, align the trap opening in the top section over the cone in the bottom section of the reference. Assemble the two sections.

Note: The tabs will not lock correctly if assembled in the opposite direction.



Troubleshooting

Prior to contacting the 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 (no indicator lights or beep during measurements).	<i>AC adapter not connected.</i> Plug in AC adapter. <i>Incorrect AC adapter.</i> Plug in correct AC adapter.
Solid red calibration indicator.	<i>Calibration required.</i> Calibrate instrument.
Calibration procedure fails.	<i>Calibration reference is dirty or damaged.</i> Clean the reference per procedure in Appendix, or replace if damaged.
Instrument and software not communicating.	<i>Interface cable not connected.</i> Connect the interface cable between the computer and the instrument. Close and restart the software application. If this does not work, reboot the computer. Remove power from the instrument, reapply power and see if the condition is corrected. Check for proper configuration setting from the software provider.
Repeated sample measurement failures (red indicators).	Ensure that the sample is being read in accordance with your software's documentation. Close and restart the software application. Perform a calibration on the instrument (see Calibration section). Clean instrument optics (see General Cleaning).

Technical Specifications

Measurement Geometrics:	d/8°, DRS spectral engine, 8mm viewing/14mm illumination
Receiver:	Blue-enhanced silicon photodiodes
Spectral Range:	400nm – 700nm
Spectral Interval:	10nm – measured, 10nm – output
Measurement Range:	0 to 200% reflectance
Measuring Time:	Approx. 2 seconds
Inter-Instrument Agreement:	<i>Ci51</i> : 0.30 ΔE^*_{ab} , based on avg. of 12 BCRA series II tiles <i>Ci51</i> : 0.50 ΔE^*_{ab} max. on any tile (specular component included). <i>Ci52</i> : 0.20 ΔE^*_{ab} , based on avg. of 12 BCRA series II tiles <i>Ci52</i> : 0.40 ΔE^*_{ab} max. on any tile (specular component included).
Short-Term Repeatability:	<i>Ci51</i> : 0.10 ΔE^*_{ab} max. on white ceramic, standard deviation (specular component included) <i>Ci52</i> : 0.05 ΔE^*_{ab} max. on white ceramic, standard deviation (specular component included)
Lamp Life:	Approx. 500,000 measurements
Power Supply:	X-Rite Part Number SE30-277 AC adapter
Data Interface:	USB 2.0
Operating Temperature Range:	50° to 104°F (10° to 40°C) 85% relative humidity maximum (non-condensing)
Storage Temperature Range:	-4° to 122°F (-20° to 50°C)
Dimensions:	4.3”H (10.9 cm) 3.6”W (9.1 cm) 8.4”L (21.3 cm)
Weight:	1.95 lbs. (.88 kg)
Accessories Provided:	Calibration reference, USB cable, Manuals & Utilities CD, AC Adapter
Usage:	Indoor only
Altitude:	2000m
Pollution Degree:	2
Overvoltage:	Category II

Design and specifications subject to change without notice.

Green Tile Color Check (Ci52 only)

1. Perform a calibration procedure if you have not already done so. Refer to the Calibrating section.
2. Select the appropriate option in the application to initiate the green tile color check.
3. Remove the protective cap from the green tile in the calibration reference.
4. Position the instrument's target window over the green tile.



5. Press the instrument firmly to the shoe. Hold steady until the measurement status indicators change to amber and then green. The calibration indicator should change to red.
6. Release the instrument.
7. Reinstall the protective cap on the green tile.
8. Store the calibration reference in a dry, dust free area, away from direct exposure to light.

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