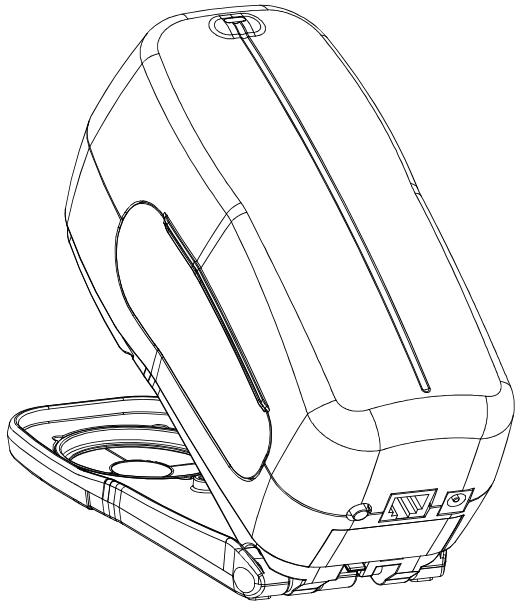


RM61

Spectrophotometer User Guide



CE Declaration

Manufacturer's Name:	X-Rite, Incorporated
Authorized Representative:	X-Rite, Incorporated Siemensstraße 12b 63263 Neu-Isenburg • Germany Phone: +49 (0) 61 02-79 57-0 Fax: +49 (0) 61 02 -79 57-57
Model Name:	Spectrophotometer
Model No.:	RM61
Directive(s) Conformance:	EMC 89/336/EEC LVD 73/23/EEC

RoHS/WEEE

X-Rite products meet the **Restriction of Hazardous Substances** (RoHS) Directive 2002/95/EC and European Union – **Waste Electrical and Electronic Equipment** (WEEE) Directive 2002/96/EC. Please refer to www.xrite.com for more information on X-Rite's compliance with the RoHS/WEEE directives.



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.

CAUTION: Operational hazard exists if battery chargers other than X-Rite SE30-81 (115V) or SE30-177 (100-240V) is used. Use only X-Rite battery pack SP62-79-23, other types may burst causing personal injury.

VORSICHT: Betriebs- und Verletzungsgefahr besteht bei Gebrauch von anderen Adaptern als X-Rite SE30-81 (115 V) oder SE30-177 (100-240 V). Verwenden Sie nur den X-Rite Akkupack SP62-79-23.

ADVERTENCIA: No use otro cargador de las pilas que no sea la pieza X-Rite SE30-81 (115V) o SE30-177 (100-240V), para evitar el riesgo de mal funcionamiento del equipo. Use solamente las pilas SP62-79-23 de X-Rite, es posible que los otros tipos puedan estallar y causar daños corporales.

ATTENTION: Pour ne pas causer un mauvais fonctionnement de l'appareil, veuillez à utiliser uniquement les chargeurs de batterie X-Rite SE30-81 (115 V) ou SE30-177 (100-240 V). Veuillez aussi à utiliser uniquement la batterie X-Rite SP62-79-23, d'autres batteries pouvant exploser et causer des blessures.

AVVERTENZA: Non usare un altro caricabatterie che non è del pezzo X-Rite SE30-81 (115V) o SE30-177 (100-240V), per evitare il rischio di malfunzionamento dell'apparecchio. Usare solamente gli accumulatori SP62-79-23 di X-Rite, è possibile che altri tipi possano scoppiare e causare danno personale.

The Manufacturer:	X-Rite, Incorporated
Der Hersteller:	4300 44th Street, S.E.
El fabricante:	Grand Rapids, Michigan 49512
Le fabricant:	
Il fabbricante:	

Declares that:	Spectrophotometer
gibt bekannt dass:	RM61
advertie que:	
avertit que:	
avverte che:	



is not intended to be connected to a public telecommunications network.
 nicht an ein öffentliches Telekommunikations-Netzwerk angeschlossen werden soll.

no debe ser conectado a redes de telecomunicaciones públicas.
 ne doit pas être relié à un réseau de télécommunications publique.
 non deve essere connesso a reti di telecomunicazioni pubblici.

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This product may be covered by one or more patents. Refer to the instrument for actual patent numbers.

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Warranty Information

X-Rite, Incorporated ("X-Rite") warrants each instrument manufactured to be free of defects in material and workmanship (excluding battery pack) 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.

This warranty shall be voided by any repair, alteration, or modification, by persons other than employees of X-Rite, or those expressly authorized by X-Rite to perform repairs, and by any abuse, misuse, or neglect of the product, or by use not in accordance with X-Rite's published instructions.

X-Rite reserves the right to make changes in design and /or improvements to its products without any obligation to include these changes in any products previously manufactured. Correction of defects by repair or replacement shall constitute fulfillment of all warranty obligations on the part of X-Rite.

THIS WARRANTY IS EXPLICITLY IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. THIS WARRANTY OBLIGATION IS LIMITED TO REPAIR OR REPLACEMENT OF THE UNIT RETURNED TO X-RITE OR AN AUTHORIZED SERVICE CENTER FOR THAT PURPOSE.

This agreement shall be interpreted in accordance with the laws of the State of Michigan and jurisdiction and venue shall lie with the courts of Michigan as selected by X-Rite, Incorporated.

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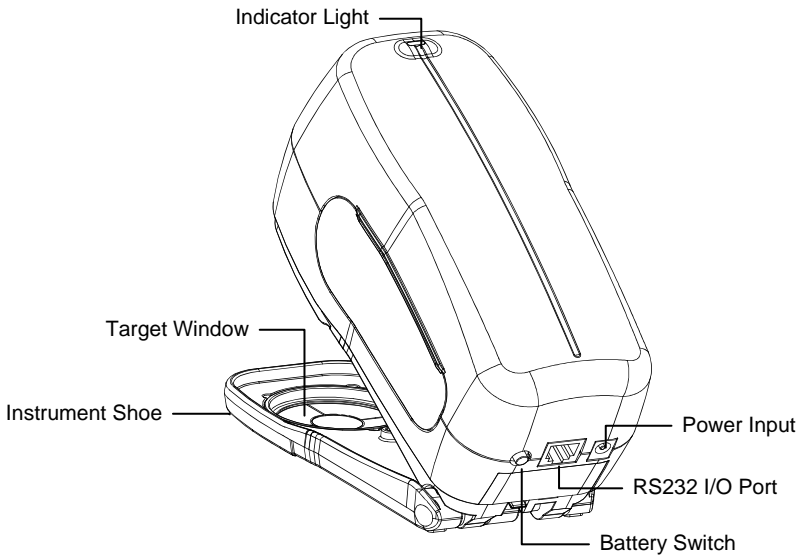
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Section 1 - Overview and Setup

Introduction

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

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.



Features

Automatic Shut-Off

To increase battery life, the instrument automatically turns off when not in use. The instrument turns back on whenever a measurement is taken or the adapter is plugged in.

Indicator Light

A multi-color LED at the top of the instrument provides visual feedback on the status of a measurement.

Packaging Content

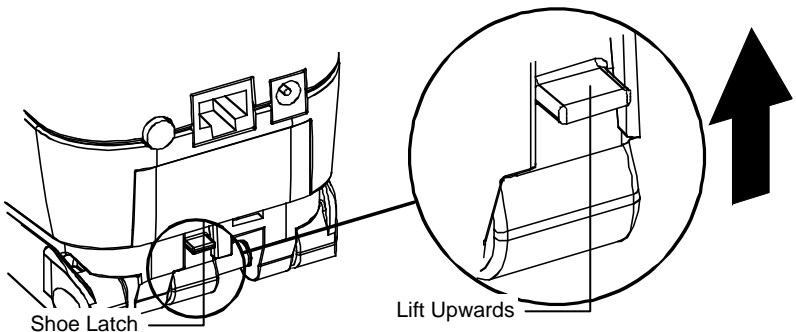
Your instrument packaging should contain all the items listed below. If any of these items are missing, contact your Authorized Representative.

- RM61 instrument with battery pack
- Interface cable
- Calibration standard
- Switching power supply with line cord
- Carrying pouch
- Documentation and registration material

Installing/Removing the Battery Pack

The instrument is shipped from the factory with the battery pack removed. The battery pack must be installed before the instrument can be used.

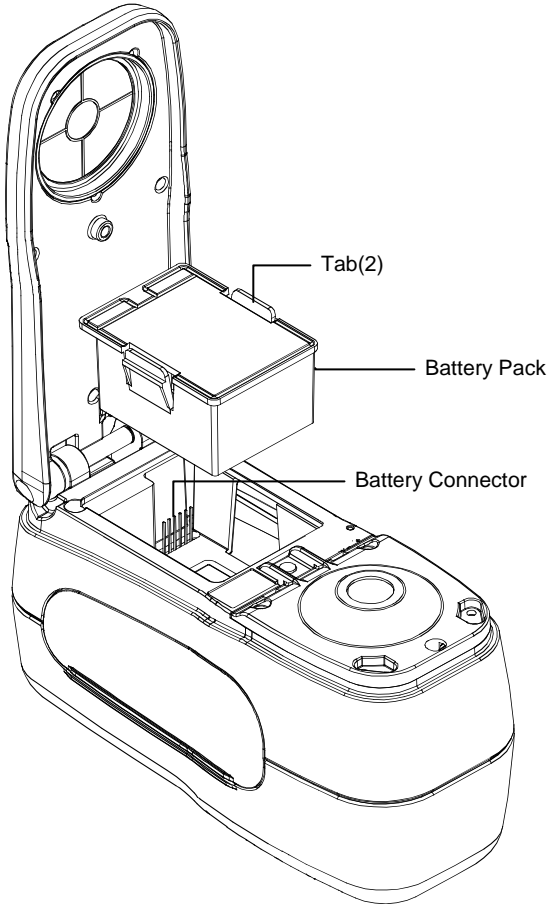
1. Hold the shoe next to the instrument housing and lift upwards on the spring-loaded latch.
2. Slowly allow the shoe to pivot toward the back of the instrument and release the latch.



Refer to the illustration on the next page

3. Open the shoe perpendicular to the instrument housing.
4. Carefully rotate the instrument over and rest it on its top.
5. Slide the battery pack into the compartment with the battery connector facing down and to the back.

6. Press down on the pack until the connector is properly seated and the tabs click into position.



7. Close the shoe to the instrument. The latch is spring loaded and automatically catches on the shoe.

To remove the battery for replacement or external charging:

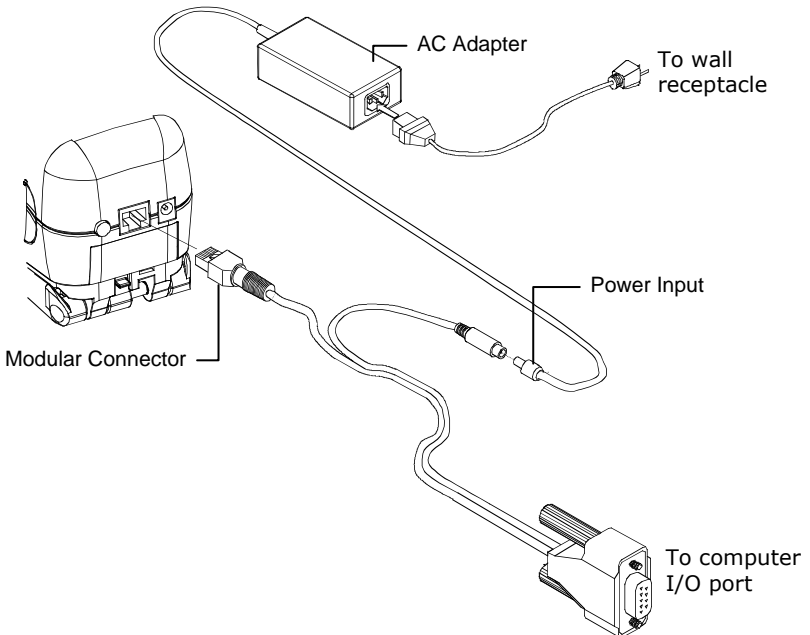
Compress the tabs on both sides of the battery pack and lift upwards.

Cable Connections and Charging



The battery pack must be installed before plugging in the AC adapter.

1. Close any open software applications and shut down your computer.
2. Insert the modular connector from the interface cable into the I/O port on back of the instrument.
3. Attach the DB9 connector from the interface cable to an available I/O port on the computer. Secure with screws.
4. Plug the small connector from the AC adapter into the power input connector on the interface cable.
5. Plug the detachable line cord into the AC adapter and then plug the line cord into the wall receptacle.
6. For "initial" remote use, allow the battery pack to charge a minimum of four (4) hours. If immediate use is required, the instrument can be operated "tethered" to the AC adapter during battery charging.
7. Turn on the computer, run the application and select the I/O port the instrument is attached to, if applicable.



Instrument LED Indicator

The LED indicates a variety of instrument conditions, such as calibration mode and operation. Below is a complete list of conditions reported by the LED.

- *Flashing Amber*—calibration is required
- *Solid Amber*—measurement in progress
- *Solid Green*—successful measurement was taken
- *Solid Red*—measurement failed

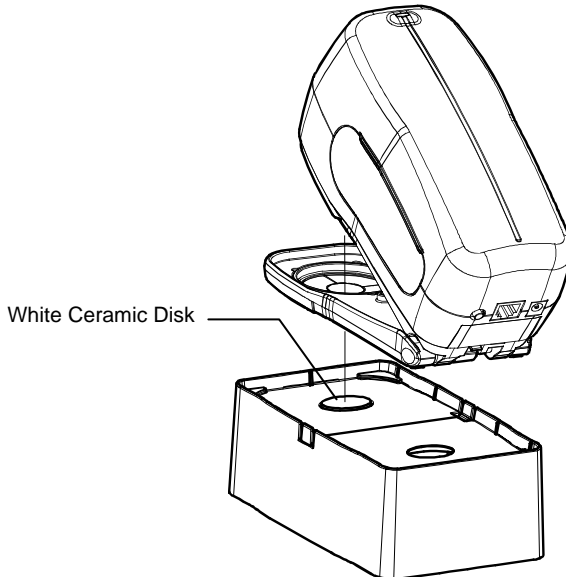
Section 2 - Calibration

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.

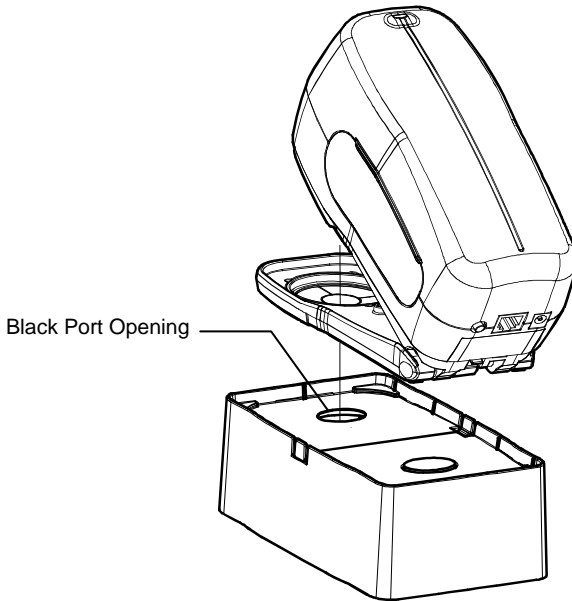
NOTE: Make sure the calibration reference is clean before use. Refer to the calibration cleaning procedure in the Appendices.

1. When a calibration is prompted for by the application, select the appropriate option to initiate the calibration. The instrument LED should be flashing amber at this time.
2. Position the instrument target window over the white ceramic disk of the calibration reference.



3. Press the instrument firmly to the shoe, the LED stops flashing (solid amber). Hold steady until the LED changes to green, followed by an audible beep.
4. Release the instrument. The LED will again flash amber.

5. Position the instrument target window over the black port opening of the calibration reference.



6. Press the instrument firmly to the shoe, the LED stops flashing (solid amber). Hold steady until two audible beeps are heard, followed by the LED flashing green for two seconds and then going out. This is an indication that the calibration procedure was successful.
7. Release the instrument.
8. Store the calibration reference in a dry, dust free area, away from direct exposure to light.

Section 3 - Taking Measurement

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

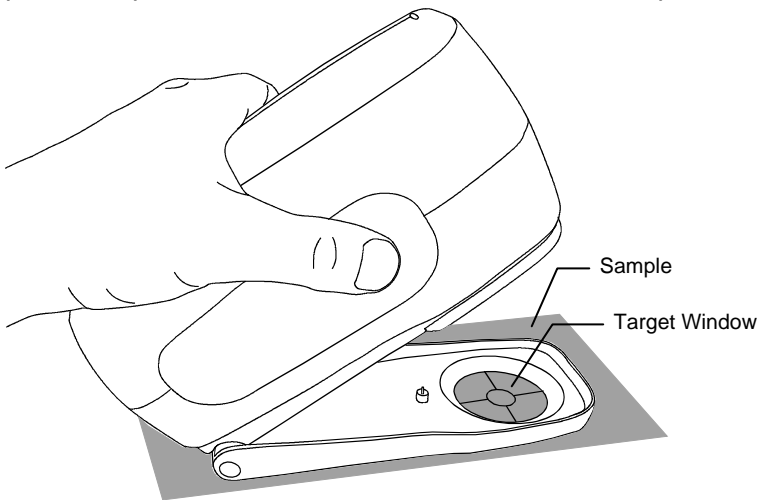
The instrument can take measures from just about any clean, dry surface that is reasonably flat. The instrument shoe should be able to rest flat and steady on the sample area. If the item to be measured is smaller than the shoe, you may want to make a platform—at the same height as the item—for the rest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

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

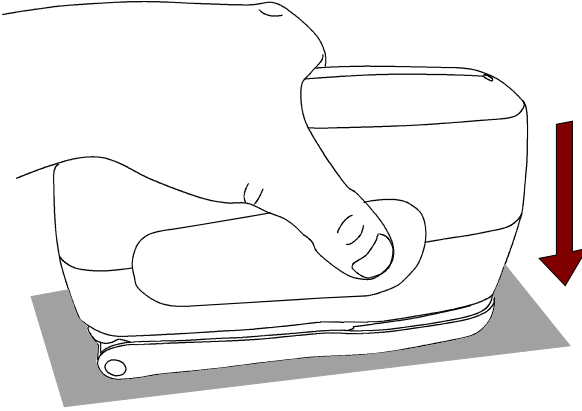
Measurement Techniques

The following information is provided to familiarize you with “mechanical” aspects of taking a measurement.

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 LED illuminates solid amber. Hold steady until one audible beep is heard, followed by a solid green LED for two seconds and then going out. This is an indication that the measurement was successful.



4. Release the instrument.

An unsuccessful measurement will be indicated with a solid red LED and long audible beep. See the Troubleshooting section for more details.

Appendices

Troubleshooting

Prior to contacting X-Rite Customer Service for instrument problems, try the applicable solution(s) described below. If the condition persists, contact a Customer Service Representative by phone at: (49) 2203-91450; or by fax at: (49) 2203-914519. You can also contact X-Rite's support staff through our Support page at www.xrite.com.

Instrument appears dead (no LED or beep during measurements):

- Ensure that the power supply is plugged in and connected to the interface cable.
- Make sure the batteries are charged.

Solid red LED:

- Measurement or calibration failed. If error persists, clean instrument and calibration reference (see General Cleaning); turn instrument power off and then on.

Instrument and software not communicating:

- Check the computer interface connections.
- 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:

- 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).

Repeated calibration failures:

- Clean instrument and calibration reference (see General Maintenance).

Service Information

The instrument is covered by a one-year limited warranty and should be referred to an authorized service center for repairs within the warranty period.

X-Rite provides repair service to their customers. Because of the complexity of the circuitry, all repairs should be referred to an authorized service center.

X-Rite will repair any instrument past warranty. 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.

Technical Support contact numbers:

Tel: (49) 2203-91450

Fax: (49) 2203-914519

General Maintenance

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.

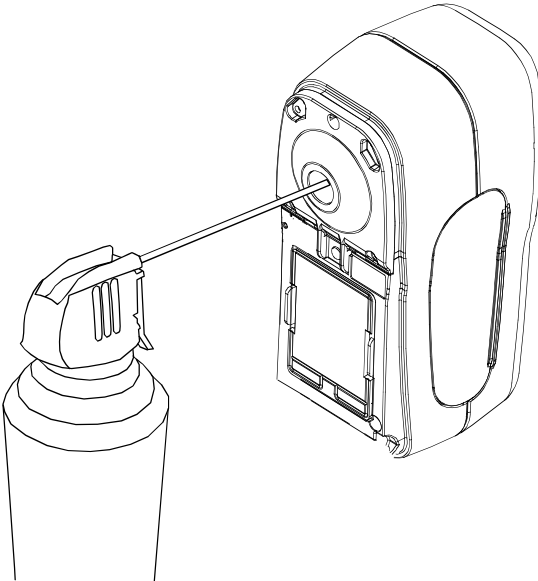
General Cleaning

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, and more often in a dirty or dusty environment. Carefully lift the instrument and blow short burst of clean, dry air into the measurement aperture. This should remove any accumulated dust in the optics area.



CAUTION: DO NOT invert cans that use compressed gas as a propellant, doing so could cause damage to the optics assembly.

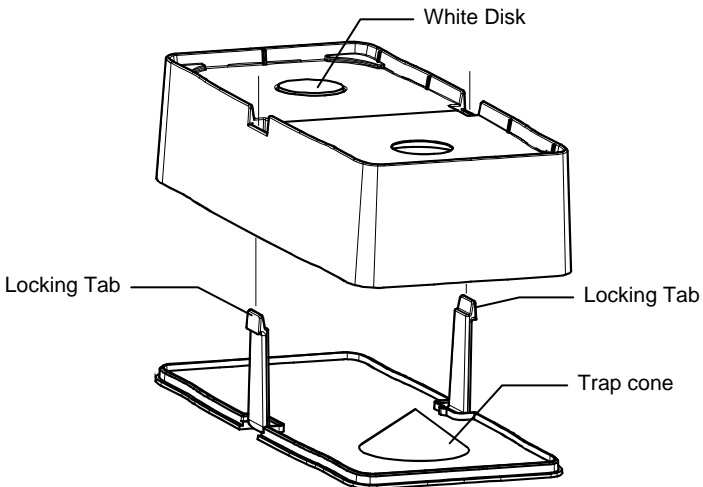
Cleaning the Calibration Reference

The calibration reference consists of a ceramic disk for white calibration measurements and a trap opening for black calibration measurements.

The white ceramic disk can be cleaned periodically using a mild soap and warm water solution, thoroughly rinsed with warm water and wiped dry with a lint-free cloth. Do not use solvents or cleaners of any kind.

The black trap portion of the reference should be cleaned with clean, dry air from time to time to remove any dust or contamination. The reference can be taken apart for easy cleaning of the black trap by compressing the two locking tabs on both sides of the case with your fingers, and separating the two sections.

NOTE: When reassembling the black trap, make sure the trap opening is positioned over the cone in the bottom portion of the trap. The tabs will not lock correctly if assembled in the opposite direction.



Make sure to store the calibration reference in a dry, dust free area, away from direct exposure to light.

Instrument Specifications

Measurement Geometrics	d/8°, DRS spectral engine, choice of optical aperture: 8mm viewing/12mm 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	0.40 ΔE^*_{ab} , based on avg. of 12 BCRA series II tiles 0.60 ΔE^*_{ab} max. on any tile (specular component included).
Short-Term Repeatability	.10 ΔE^*_{ab} max. on white ceramic, standard deviation (specular component included)
Lamp Life	Approx. 500,000 measurements
Power Supply	Removable (Ni-metal hydride) battery pack; 7.2 VDC rated @ 1650 mAh
AC Adapter Requirements	Input 100-240 VAC, 50/60Hz, 12 Vdc Output
Charge Time	Approx. 4 hours – 100% capacity
Measurements Per Charge	1,000 measurements typical
Data Interface	Patented bi-directional RS-232, 300-57,600 baud
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 (10.9cm) 3.3”W (8.4cm) 7.7”L (19.6cm)
Weight	2.4 lbs. (1.1 kg)
Accessories Provided	Calibration Standard, Manual, AC Adapter
Usage	Indoor only
Altitude	2000m
Pollution Degree	2
Overvoltage	Category II

X-Rite standards are traceable to National Research Council Canada, Laboratory for Basic Standards. This product covered by U.S. and foreign Patents Pending. Specifications and design subject to change without notice.



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Please visit www.xrite.com for a local office near you.