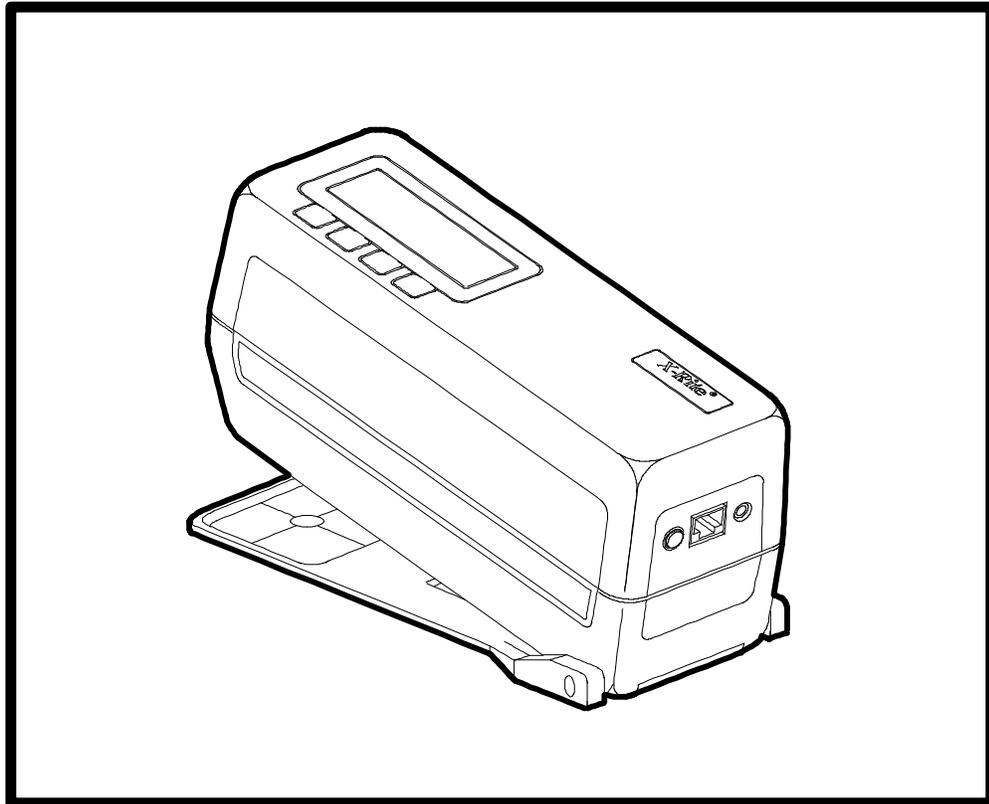


X-Rite[®]
SP58 Sphere Spectrophotometer



Operator's Manual



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Rev. C-09/06/96



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Dear Customer:

Congratulations! We at X-Rite, Incorporated are proud to present you with an X-Rite SP58 Sphere Spectrophotometer. This instrument represents the very latest in low power integrated circuit design. As a result, your X-Rite SP58 is a rugged and reliable instrument whose performance and design exhibit the qualities of a finely engineered instrument, which is not surpassed.

To fully appreciate and protect your investment, we suggest that you take the necessary time to read and fully understand this manual. As always, X-Rite stands behind your instrument with a one year limited warranty, and a dedicated service organization. If the need arises, please don't hesitate to call us.

Thank you for your trust and confidence.

Ted Thompson,
Chairman and CEO

X-Rite GmbH, Germany Ž X-Rite Asia Pacific Ltd, Hong Kong Ž X-Rite Ltd, United Kingdom

Proprietary Notice

The information contained in this manual is derived from patent and proprietary data of X-Rite, Incorporated. This manual has been prepared expressly for the purpose of assisting in the use and general maintenance of this instrument.

Publication of this information does not imply any rights to reproduce or use this manual for purposes other than installing, operating, or maintaining this instrument. No part of this manual may be reproduced, transcribed, transmitted, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, magnetic, mechanical, optical, manual, or otherwise, without the prior written permission of an officer of X-Rite, Incorporated.

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Limited Warranty

X-Rite, Incorporated warrants each unit manufactured to be free of defects in material and workmanship for a period of twelve months. If the fault has been caused by misuse or abnormal conditions of operations, repairs will be billed at a nominal cost. In this case, an estimate will be submitted before work is started, if requested. The unit shall be returned with transportation charges prepaid.

There are no warranties of merchantability or fitness. This warranty obligation is limited to servicing the unit returned to X-Rite, Incorporated or an authorized dealer for that purpose.

X-Rite, Incorporated offers a repair program for instruments out of original warranty coverage. For more information, contact X-Rite Instrument Services Department.

Always include serial number in any correspondence concerning the unit. The serial number is located on the back of the instrument.

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.

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

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Getting Started

This section covers unpacking, inspection, and operation of your instrument. A general product description and vocabulary illustration is also included. You should read through this entire section to familiarize yourself with your instrument.

Section One Contents

- Unpacking and Inspection
- General Product Description
- Unlocking/Locking the Shoe
- Installing Battery Pack
- Applying Power
- Charging the Battery Pack
- Instrument Positioning and Measurement Techniques

UNPACKING AND INSPECTION

After removing the instrument from the shipping carton, inspect for possible damage. If any damage had occurred during shipping, immediately contact the transportation company. Do not proceed with installation until the carrier's agent has inspected the damage.

Your instrument was packaged in a specially designed carton to assure against damage. If reshipment is necessary, the instrument should be packaged in the original carton. If the original carton is not available, contact X-Rite to have a replacement shipped to you.

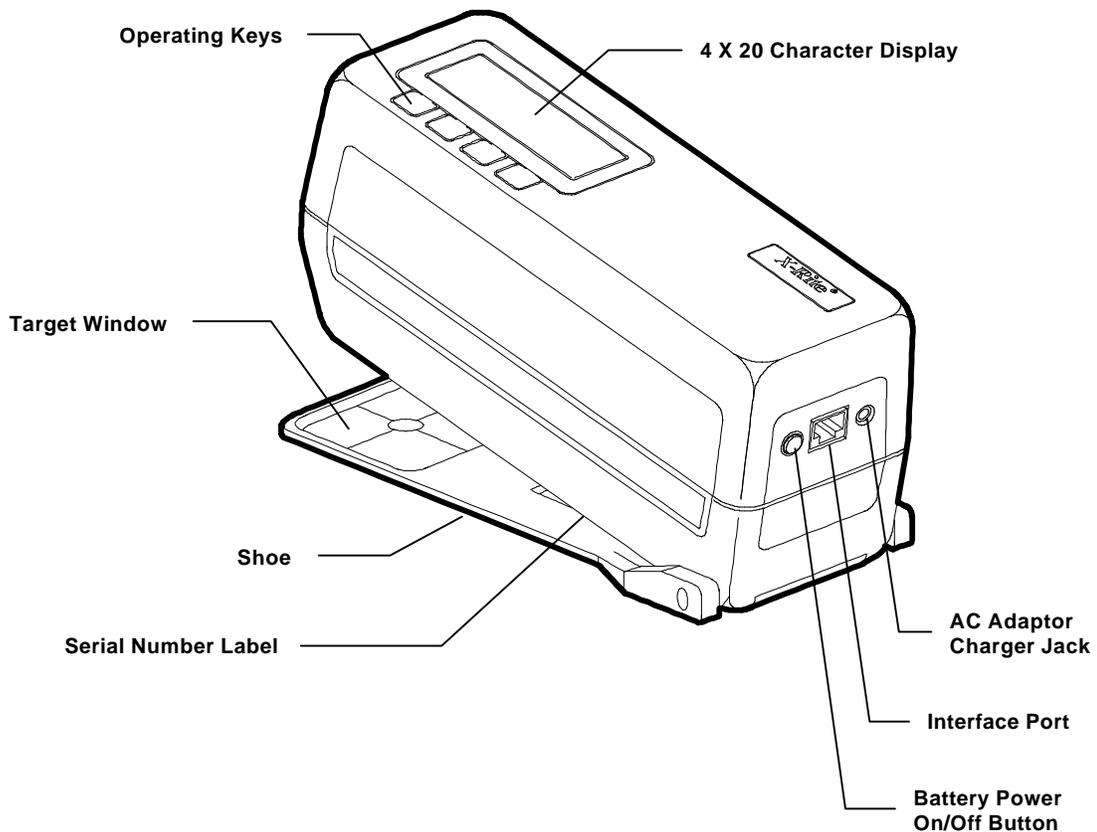
Packaging Drawing and Parts List

Check your packaging contents against your packing list and your original order. Detailed packaging drawing and parts list is included in this manual as *Appendix C*.

GENERAL PRODUCT DESCRIPTION

The X-Rite SP58 is a portable sphere spectrophotometer that measures color samples from a variety of materials, including, paper, textiles, and various painted objects. The instrument measures reflectance values which can either be stored internally for future upload to a computer—storage mode—or, transmitted instantaneously via RS-232 port—computer mode. The operational mode is controlled by the software with which it is used.

The SP58 uses a dual beam optics system which ensures long-term stability, accuracy, and reliability of measurements. The pulsed tungsten lamp provides a reliable and consistent light source which has very long life and prevents heat build-up.



UNLOCKING/ LOCKING SHOE

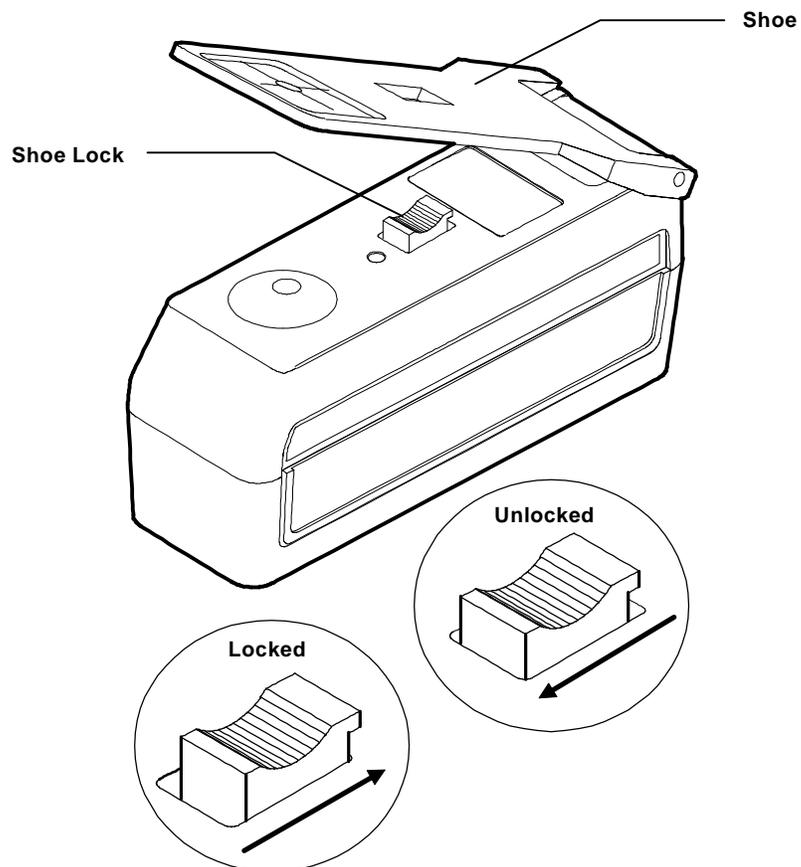
The instrument is shipped from the factory with the shoe in the locked position. The shoe should always be locked next to the instrument when it is stored.

To Unlock Shoe:

- Hold shoe against instrument.
- Slide lock button on bottom of instrument towards “front” until it stops, then slowly release the shoe.

To Lock Shoe:

- Hold shoe against unit.
- Slide lock button towards “back” of unit until it stops, *slowly* release shoe.

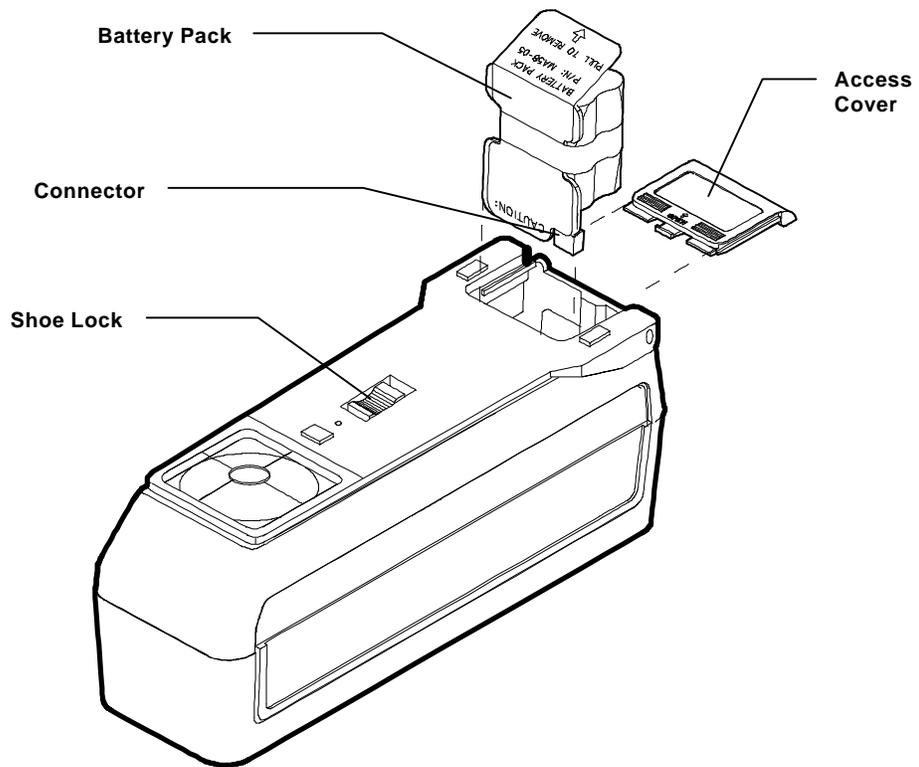


INSTALLING BATTERY PACK

The instrument is shipped from the factory with the battery pack removed. **The battery pack is located in the instrument case (refer to Appendix C for location) and must be installed before the instrument is used.**

To Install Battery Pack:

- Carefully turn instrument over and lock shoe if not locked.
- Remove battery access cover by sliding outward away from instrument.
- Slide battery pack into unit—with connector end down—until properly seated.
- Reinstall battery access cover by sliding into position.
- Refer to the following pages for battery charging information.



APPLYING POWER

NOTE: The battery pack must be installed before plugging in the AC Adaptor.

During battery operation, power is applied by pressing the “On/Off” button located at the rear of the instrument. When the battery power is left On, the instrument will automatically shut off after “45 seconds” of non-use to conserve battery life. If the SP58 is allowed to power-down, simply taking a measurement or pressing any key will reactivate the instrument. The power switch should always be used to turn Off the instrument when it is to be stored.

The instrument will remain “On” at all times when the AC adaptor is used. The power On/Off button will act as a “reset” and return the instrument to its main mode.

CHARGING THE BATTERY PACK

NOTE: The battery pack must be charged before use.

The instrument is powered by six, AA nickel-metal hydride batteries in a removable battery pack. The battery pack *must* remain in the instrument at all times for proper operation. The AC adaptor charges the batteries when it is plugged in, but does not eliminate the need for the batteries.

The instrument can be operated while the batteries are being charged. Before plugging in the AC adaptor, make sure that the voltage indicated on the adaptor complies with the AC line voltage in your area. If not, contact X-Rite or your Authorized Representative.

The instrument’s batteries should be fully charged in 16 hours and should provide over 500 measurements. Charging the batteries for less than 16 hours will reduce the operating time of the instrument—see charging tips.

Charging Tips

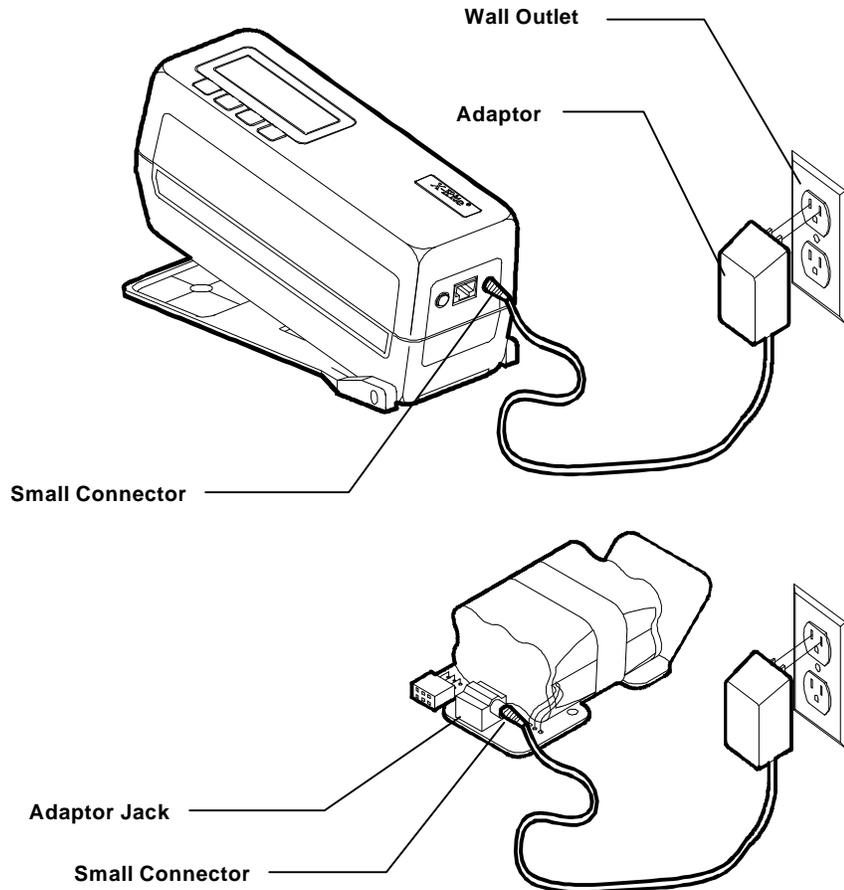
- The instrument features a “fast charge cycle” which will charge a fully discharged battery pack to 50% capacity in 4 hours. A 100% charge will be restored to a fully discharged pack in 16 hours.
- A “**Battery Low**” message will appear on the display when there are approximately 50 measurements remaining. The charger should be plugged in as soon as possible when this message appears. A “**Batteries Very Low - Must Be Charged**” message will appear when there is insufficient charge to operate the instrument. Once this message appears, the charger must be connected before any more measurements can be taken.

- The removable battery pack is equipped with a built-in charger jack for external charging. This allows an additional pack to be charged while one is in use in the instrument. A fully discharged pack will be completely charged in 16 hours.
- If the instrument is to be stored for an extended period of time—over 6 months—remove the battery pack.

NOTE: Do not plug the AC adaptor into the instrument without a battery pack installed. The instrument will not function with the battery pack out. Refer to Installing Battery Pack.

AC Adaptor Connection

- Plug the small connector end of the adaptor into the back of the unit or the battery pack
- Plug the adaptor into the wall outlet.



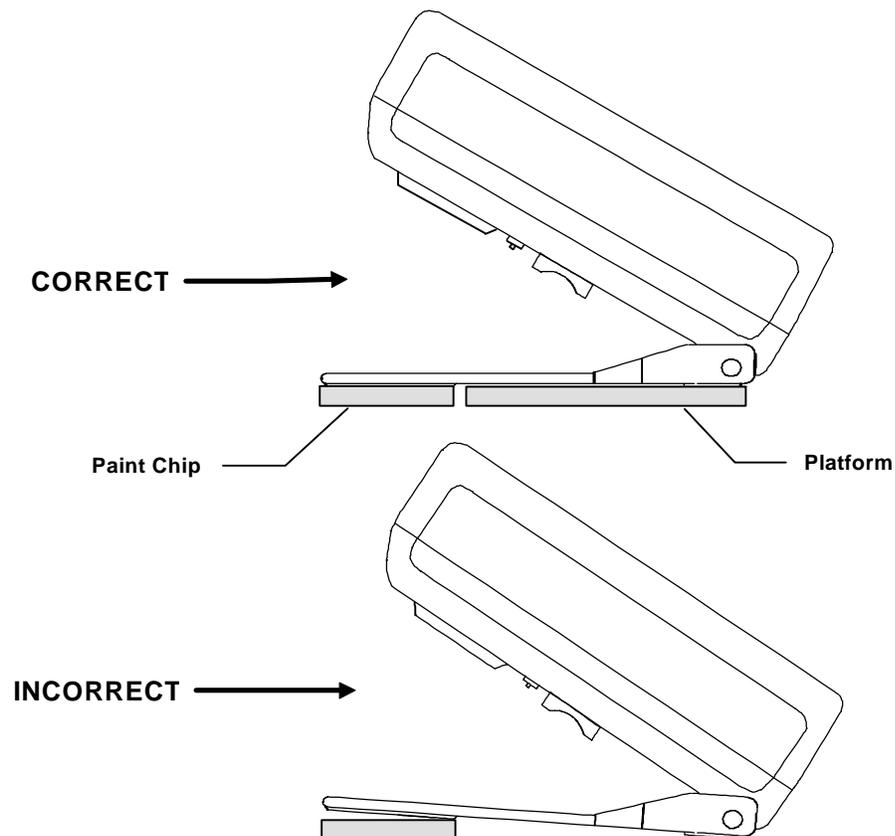
NOTE: The instrument will not lose any stored readings if the batteries are removed. Refer to Section 4 for proper removal and installation.

POSITIONING AND MEASUREMENT TECHNIQUES

The variety of items that the SP58 instrument can measure is almost endless. However, to obtain accurate and repeatable measurements, the bottom of the shoe must be parallel with the surface to be measured. The reason for this is that any movement during a reading can cause the data to vary. To obtain the most accurate and repeatable measurements, there are a few guidelines you must follow:

- The sample to read must be larger than the target window opening.
- If the sample to be read is smaller than the shoe, you may want to make a platform—the same height of the sample—for the instrument to sit on. See example below.
- The sample color should be uniform and consistent across the measurement area, with no fading or blemishes.
- The sample should be opaque—not clear or translucent.

Positioning Example



SECTION ONE

Instrument Calibration

Using the SP58 instrument is an accurate and reliable way to measure and store sample data. Calibration of the instrument is important to maintaining this reliability.

Section Two Contents

- Calibration Information
- Positioning the Instrument on the White Calibration Standard
- Calibration Procedure

CALIBRATION INFORMATION

The remote instrument should be calibrated to the white standard and black trap the first thing each day, and every four hours of operation thereafter—more frequently if measuring dark or high chroma colors. In any event, a “**NEED CALIBRATION**” message will appear in the display when:

1. calibration procedure has not been performed for 24 hours.
2. change in temperature has occurred since last calibration.
3. black trap or white cal is measured incorrectly.

Whenever this message appears in the display, the calibration procedure should be performed before another reading is taken, to ensure accuracy.

Calibration Notes

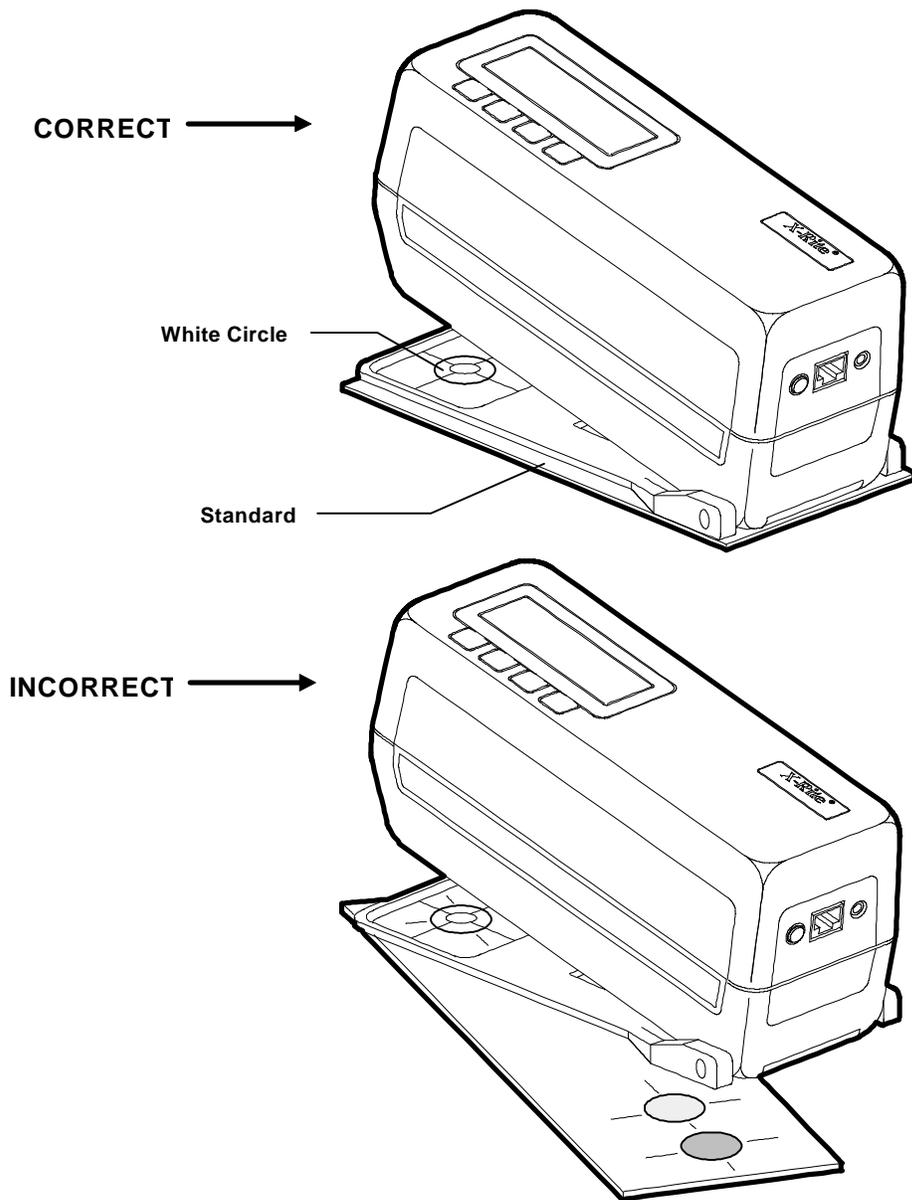
- Dirt or dust in the sample port optics area will cause an inaccurate calibration reading. Refer to Section 4 for sample port optics cleaning procedure.
- The white ceramic reflection standard is dramatically affected by smudge marks, dust, and finger prints. Refer to Section 4 for white calibration cleaning procedure.
- The black trap should be cleaned periodically to remove any dust or contamination that may have gotten in the tube. Refer to Section 4 for black trap cleaning procedure. Always store black trap with cap on the measurement opening.
- 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 WHITE CALIBRATION STANDARD

You must set the instrument on the white calibration standard, so that the shoe rests completely on the standard, and the target is centered over the circle. If you do not, the unit may rock slightly, causing an erroneous reading of the standard.

Positioning

- Center the target window over the white circle. Make sure that rubber pads are completely on the standard, and the shoe is flat.



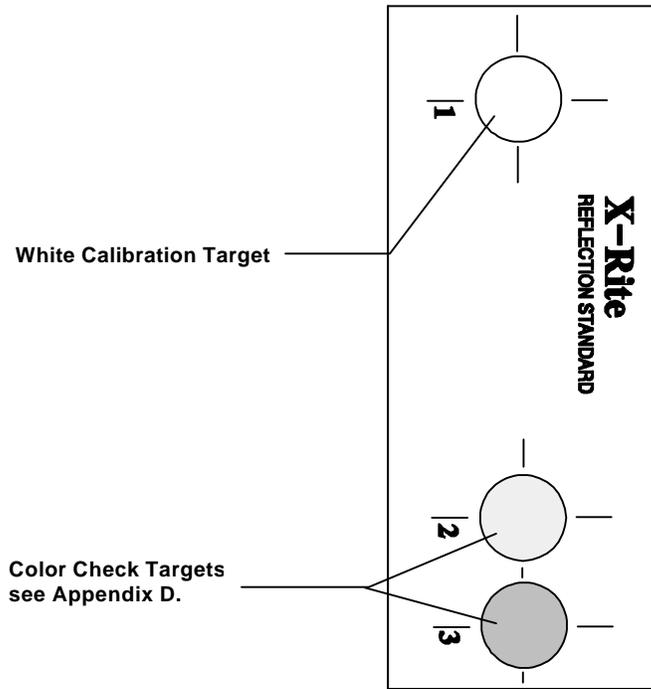
Reflection Standard

Calibration values for the white spot are affected by the environment and cleaning method of the standard.

If the white spot does not measure correctly, the instrument could need calibration, there may be dust in the sample port optics, or the standard may be dirty.

The standard should be cleaned using a mild soap solution—thoroughly rinsed with warm water, and wiped dry with a clean, lint free cloth.

NOTE: If you lose your protective envelope, you can obtain the calibration values from the back page of this manual. Otherwise, contact X-Rite with the serial number of your standard and get the values.



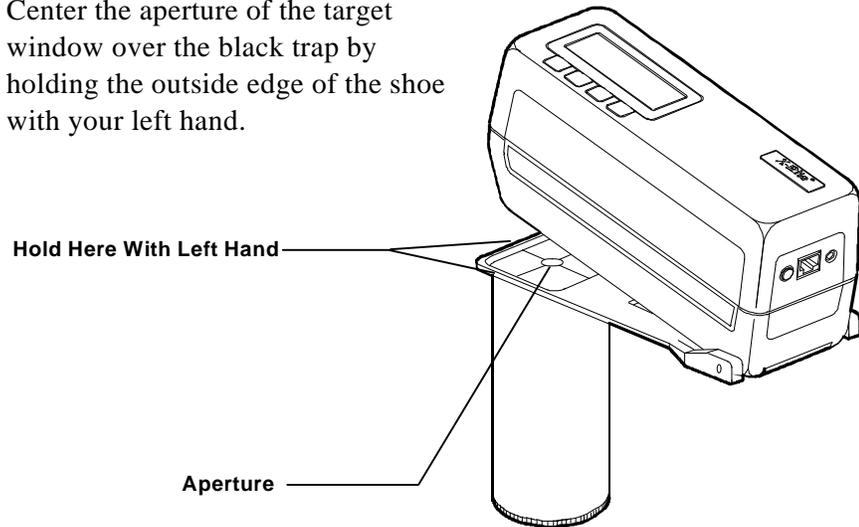
POSITIONING THE INSTRUMENT ON THE BLACK TRAP

The aperture in the target window must be centered—as close as possible—over the black trap opening. Make sure that the base of the trap is setting on a flat, level surface. Any movement of the trap during measurement may cause an error message to display.

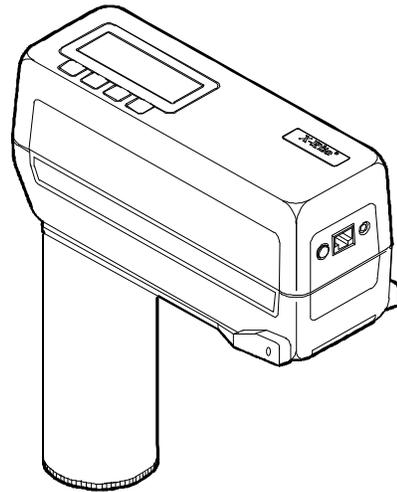
The black trap should be cleaned periodically with clean, dry compressed air, or wiped clean with a lint free cloth.

Positioning

- Center the aperture of the target window over the black trap by holding the outside edge of the shoe with your left hand.



- Lower instrument to the shoe and hold until the measurement is taken.



NOTE: WARNING! LARGE CHANGE, CHECK FOR DUST or message will occur during zero reflectance measurement if dust is detected in the trap or optics, or if the instrument experiences normal drift. If this message appears, clean optics and black trap, and measure zero reflectance again.

CALIBRATION PROCEDURE

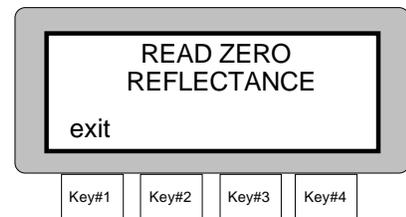
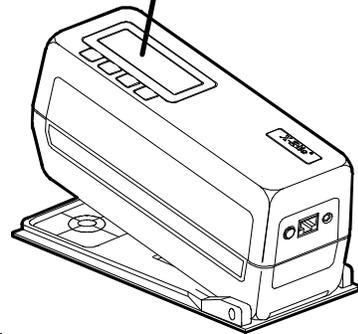
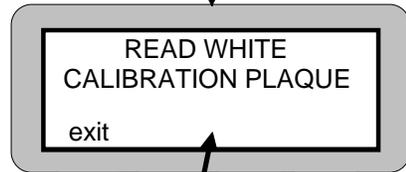
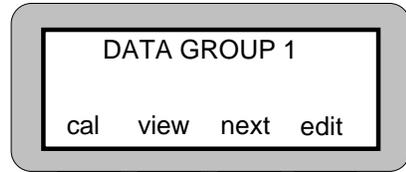
- Make sure that the white calibration standard and black trap are clean. Refer to Section 4.
- Press **[cal]** key #1 to access **READ WHITE CALIBRATION PLAQUE** screen.

The software datecode and copyright are momentarily displayed.

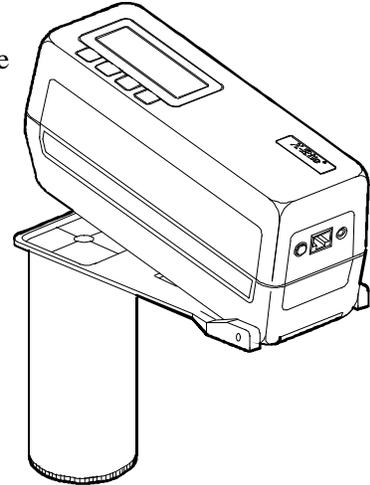
- Position instrument on white standard—as previously discussed.
- Lower instrument to the shoe and hold until **READING COMPLETE** message appears.

NOTE: If **PLEASE WAIT XX (1-30) SECONDS** is displayed during calibration, continue to hold instrument against shoe until calibration readings are over. This will only occur if the calibration procedure is performed within “30 seconds” of a previous measurement.

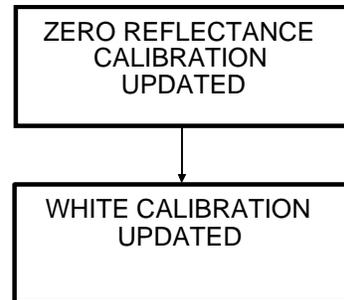
If white measurement procedure was successful, **READ ZERO REFLECTANCE** screen will appear.



- Position instrument over black trap—as previously discussed—and lower to shoe until **READING COMPLETE** message appears.



If black trap measurement procedure was successful, **ZERO REFLECTANCE CALIBRATION UPDATED** and **WHITE CALIBRATION UPDATED** screens will momentarily display.



NOTE: If an error message occurred during calibration, clean white standard and/or black trap (see Section 4) and try reading again. If message still occurs, refer to Appendix B.

Measurement Procedure

Your SP58 instrument is capable of operating either in storage mode or computer mode. The instrument's operational mode is controlled by the software with which it is used. The following pages will explain the operation procedures for both modes.

Section Three Contents

- Storage Mode
- Computer Mode (tethered)

STORAGE MODE

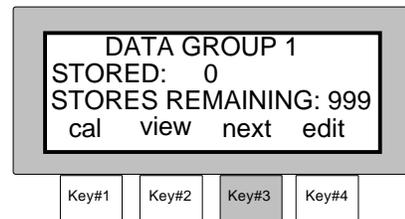
The storage mode is used to store and clear measurements that are taken at remote locations. After sample data is stored, it is transferred (uploaded) to a computer via an RS-232 interface.

Storing Measurements

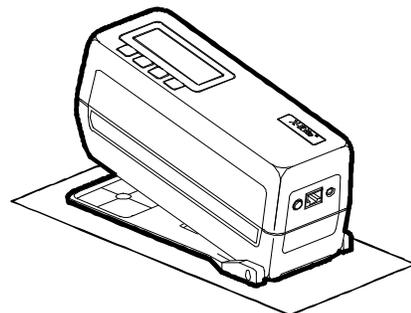
Stored samples can be assigned to specific group numbers for tracking purposes. A total of 999 measurement can be stored over 20 group locations. Group numbers can be randomly selected for measurement storage.

To Store a Sample

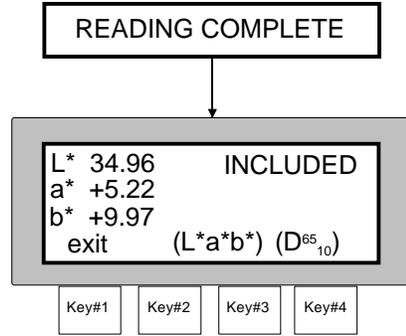
- If you wish to store the sample reading in a different group than the one displayed, press the **[next]** key #3 to select group number.



- Position your instrument on the sample to be measure. Lower the instrument to the shoe.

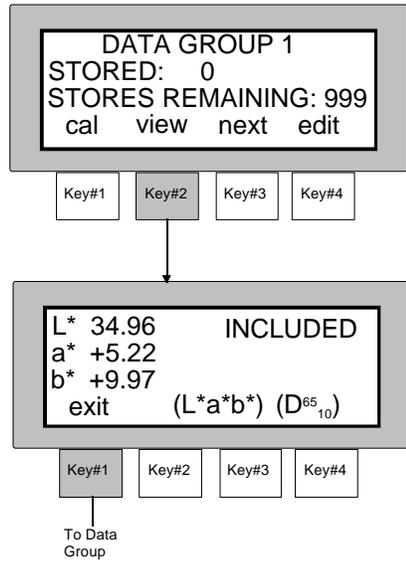


- Hold until **READING COMPLETE** and measurement data is displayed.



- Release instrument from sample. Storage screen is displayed.

NOTE: Measurement data can be redisplayed by pressing **[view]** key #2. Press **[exit]** key #1 to go back to storage screen.



Clearing Stored Samples

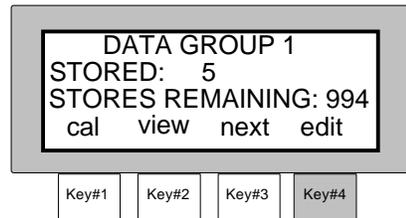
Three deletion methods are available for removing stored sample measurements from the instrument.

Last - deletes only the last measurement in the selected group.

Group - deletes all of the measurements stored in the selected group.

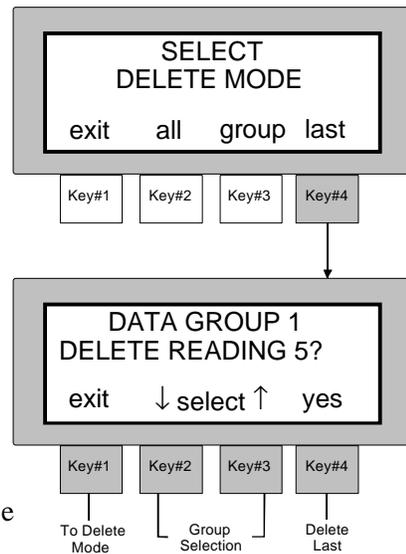
All - deletes all measurements in all twenty groups.

- Press the **[edit]** key #4 to access **SELECT DELETE MODE** screen.



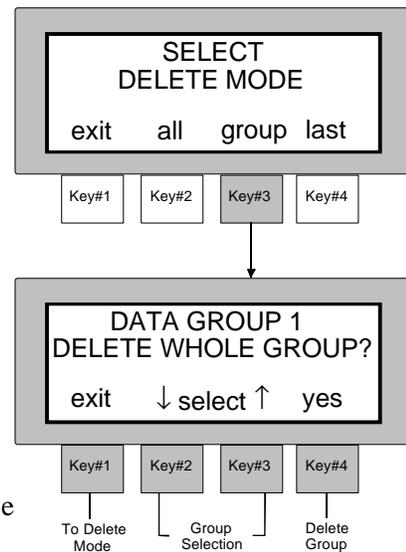
To Delete Last Sample:

- At the Select Delete Mode screen, press [**last**] key #4 to access **DATA GROUP** screen.
- Press [**↓**] key #2 or [**↓**] key #3 to select group location.
- Press [**yes**] key #4 to delete *last* sample in selected group.
- Press [**exit**] key #1 once to return to the delete mode screen, or press twice to return to the storage screen.



To Delete Group:

- At the Select Delete Mode screen, press [**group**] key #3 to access **DATA GROUP** screen.
- Press [**↓**] key #2 or [**↓**] key #3 to select group location.
- Press [**yes**] key #4 to delete *all* samples in selected group.
- Press [**exit**] key #1 once to return to the delete mode screen, or press twice to return to the storage screen.



To Delete All:

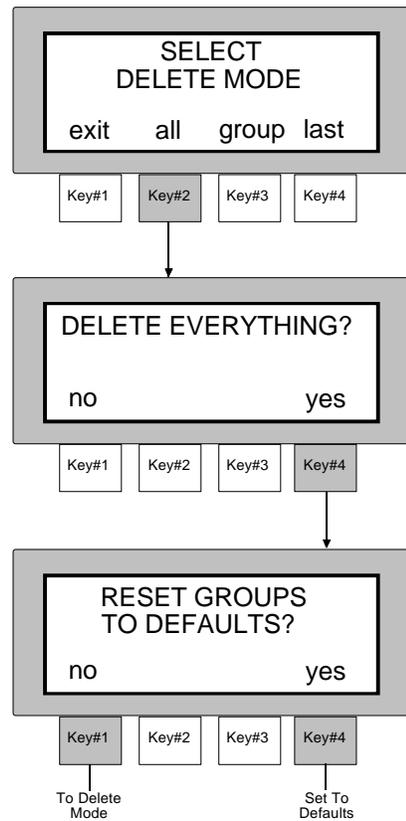
- At the Select Delete Mode screen, press **[all]** key #3 to access **DELETE EVERYTHING?** screen.

- Press **[yes]** key #4 to delete *all* samples in *all* groups. The **RESET GROUPS TO DEFAULTS** screen will appear.

NOTE: Default group names are Data Group 1, Data Group 2, etc.

- Press **[no]** key #1 to keep preset group names, or press **[yes]** to reset names to factory default names.

- Press **[exit]** key #1 to return to the storage screen.

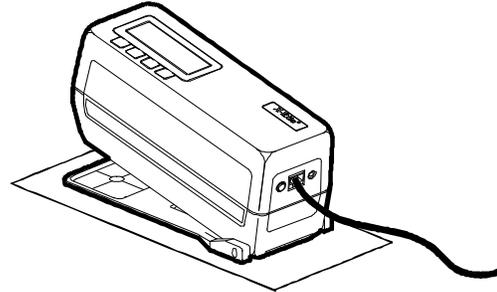


COMPUTER MODE (TETHERED)

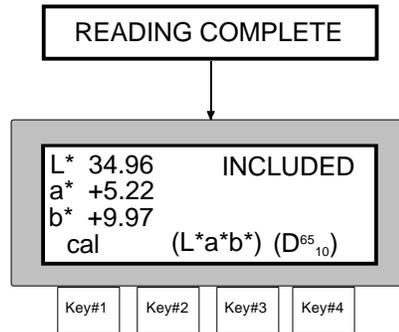
In computer mode the instrument is used as a spectral measurement device. Each sample measured is transmitted to a computer via an RS-232 interface. Sample measurements are shown on the instrument display but no data is stored.

To Measure a Sample

- Position your instrument on the sample to be measure. Lower the instrument to the shoe.



- Hold until **READING COMPLETE**s displayed.
- Release instrument from sample. Measurement data is transferred to the computer.



SECTION THREE

General Maintenance

This section covers repair information, cleaning, general maintenance, and troubleshooting tips for your remote instrument.

Section Four Contents

- Repair Information
- Cleaning the Instrument
- Replacing the Battery Pack
- Replacing the Target Window
- Troubleshooting Tips

REPAIR INFORMATION

Your SP58 Instrument is covered by a one-year limited warranty—excluding battery pack—and should be referred to the factory for repair within the warranty period. Attempts to make repairs within this time frame may void the warranty.

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

X-Rite will repair any SP58 past warranty. Shipping cost to the factory shall be paid by the customer, and the instrument shall be submitted in the original carton, as a complete, unaltered unit.

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 a mild cleaner, whenever required.

NOTE: *DO NOT* use any ketone solvents to clean the unit, this will cause damage to the cover.

Cleaning the Target Window and Sample Port Optics

The target window and optics should be cleaned once-a-week in normal environments, and more often in dirty or dusty environments.

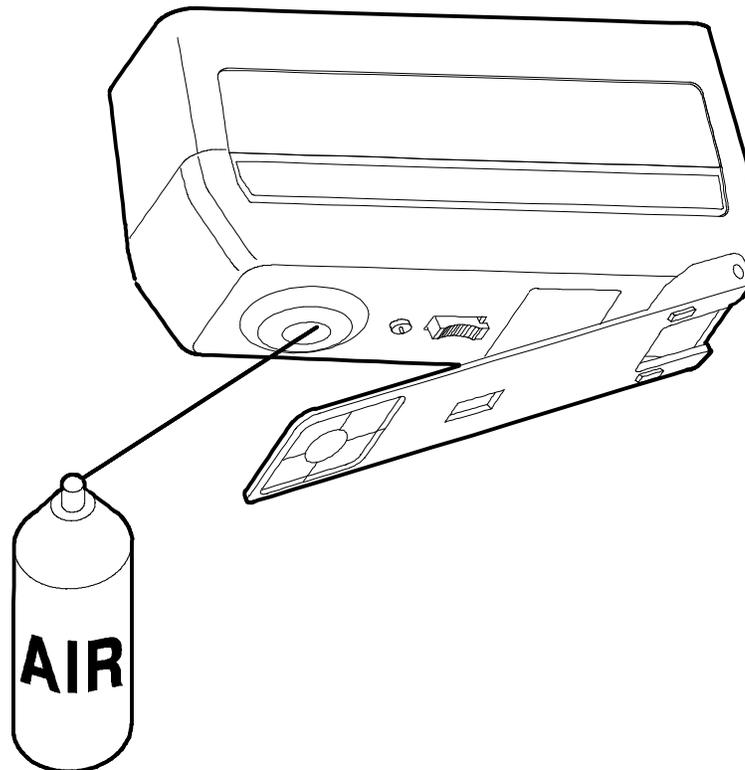
For Target Window:

- Remove dust and dirt by wiping with a clean, lint-free cloth, slightly moistened in water.

For Optics:

- Carefully lift instrument and blow shorts bursts of clean, dry air into the optics opening. This should remove any accumulated dust in the optics area.

WARNING: *DO NOT* use an air can that uses freon as a propellant, doing so could cause damage to the optics assembly.



Cleaning the White Calibration Standard

The ceramic standard 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.

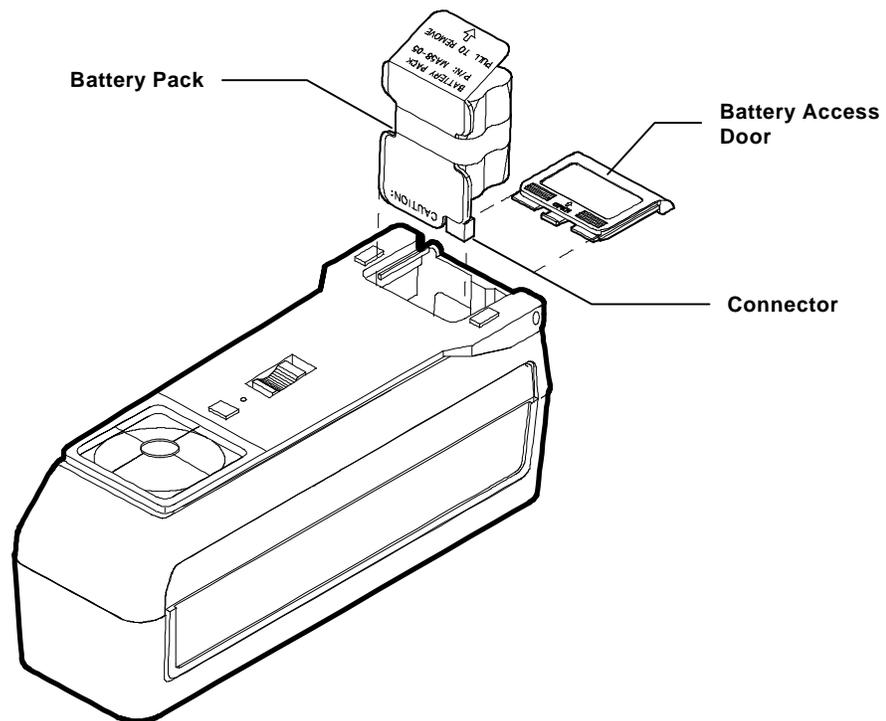
Cleaning the Black Trap

The black trap should be cleaned periodically with clean, dry compressed air, or wiped clean with a lint free cloth.

REPLACING THE BATTERIES

Battery Pack Part Number: MA58-05

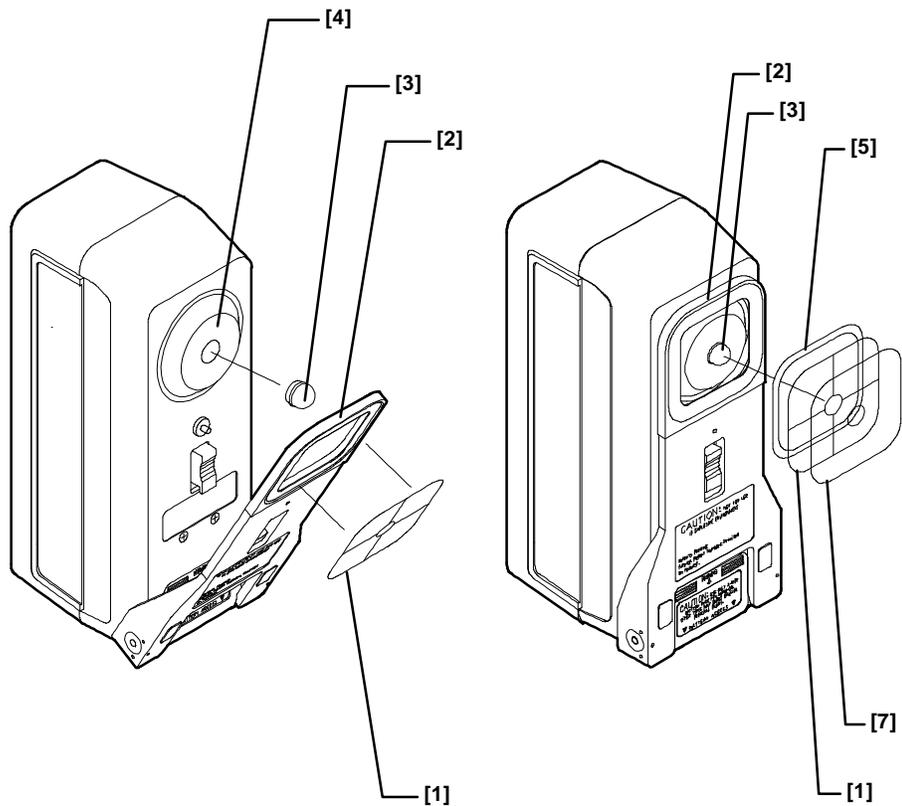
- Unplug the AC adapter and click power switch to OFF.
- Carefully set instrument on it's top and lock shoe in place—shoe must be locked.
- Slide battery access door toward rear of instrument and remove.
- Grasp plastic tab that extends from battery pack and pull until pack is removed.
- Slide new—or charged—battery pack into instrument until connector is properly seated.
- Reinstall battery access door and unlock shoe.
- Discharged battery packs should be charged in the instrument for 16 hours.



REPLACING THE TARGET WINDOW

Target Window Part Number: SP68-21-08

- Unplug the AC adapter and turn battery power Off.
- Carefully place instrument on end, remove old target window [1] by pushing outward from inside of shoe [2]. Clean off any remaining adhesive from shoe [2].
- Insert target window alignment plug [3] into sensor nose [4].
- Compress shoe [2] all the way down and lock in position.
- Remove paper backing [5] from adhesive on new target window [1].
- Place target window hole over alignment plug [3] and align crosshairs [6] squarely with shoe [2].
- Remove clear protective backing [7] from target window [1].
- Unlock shoe [2] and remove alignment plug [3].



TROUBLESHOOTING TIPS

Instrument does not turn On:

- Power Switch Off (battery operation only).
- Batteries are very low and in need of charge.
- Contact X-Rite or Authorized Service Center.

Instrument will display but not measure:

- Battery pack not installed.
- Contact X-Rite or Authorized Service Center.

Instrument will not calibrate properly:

- The white calibration reference is dirty.
- Reading optics are dirty.
- Contact X-Rite or Authorized Service Center.

SECTION FOUR

Technical Specifications

Display:	4-row by 20-character supertwist dot-matrix LCD
Measurement Geometry	Standard Area View (11mm illumination / 8mm viewing)
Light Source:	Gas filled tungsten lamp, approx. 2865 deg. K (corrected for D65 illuminant)
Illuminant Types (set by RCI):	C, D ₅₀ , D ₆₅ , F2, F7, F11, & F12
Standard Observers (set by RCI):	2° & 10°
OEM Correction Output (set by RCI):	Data output with colorimetric calculations corrected to specific competitive instrument types (e.g., Minolta CR200b mode: selects custom Ill/Obs table and applies corrected math).
weight	
Measurement Output Functions; Specular Component Included (set by RCI):	XYZ, L*a*b*, L*C*h° Percent Reflectance (10nm intervals; 400nm-700nm)
Inter-Instrument Agreement:	0.30 ΔE^*_{ab} average (based on average of 12 BCRA series II tiles) 0.50 ΔE^*_{ab} max on any tile
Repeatability:	0.10 ΔE^*_{ab} for 20 measurements @ 5 second intervals on white cal tile
Measurements per Charge:	Approximately 500 typical
Measurement Time:	Approximately 2.5 seconds
Power Supply:	Six rechargeable AA NI-metal hydride batteries in a removable battery pack, 7.2v total rated @ 1100mAh (included)
Charge Time:	In Instrument - 4 hours (50%), 16 hours (100%) External Pack Charge - Approx. 16 hours
AC Adaptor Requirements:	SP58: 90-130VAC, 50-60Hz, 15W Max. SP58: 180-260VAC, 50-60Hz, 15W Max. 12VDC @ 700ma: positive tip
Operating Temp. Range:	50 - 104°F (10° - 40°C) 85% relative humidity maximum (non-condensing)
CAUTION:	This instrument is not for use in explosive environments.

APPENDIX A

Storage Temp Range:	-4 - 122°F (20° - 50°C)
Weight:	3 lbs. 2oz. (1.4 kg)
Dimensions:	4.56" H x 3" W x 8.85" L (11.6cm H x 7.62cm W x 22.5cm L)
Supplemental Provisions:	Operator's Manual Calibration Standard Black Trap AC Adaptor Carrying Case

Specifications and design subject to change without notice.

Error Messages

Below is a list of error messages that could occur on your instrument. If an error message should appear, make a note of it and take the appropriate steps to try to correct it. If an error message is consistently displayed, contact X-Rite or an authorized service center.

Measurement Error Messages

INVALID READING - BATTERIES VERY LOW, MUST BE CHARGED indicates batteries are too low to operate the unit. Plug in charger and wait 5 minutes before attempting to take accurate measurements.

INVALID READING - LIGHT LEAKAGE stray light is getting into measurement aperture. Make sure measurement surface is flat.

INVALID READING - MAXIMUM REFLECTANCE EXCEEDED surface measured is greater than the maximum range of the instrument (200%).

INVALID READING - RESET DURING READ, CHECK BATTERIES this message may appear if the instrument is stored for an extended period of time. Recharge the batteries for 16 hours. If batteries are not charged after 16 hours, replace battery pack.

INVALID READING - SWITCH RELEASED TOO SOON read switch was not closed during entire reading. Try taking reading again.

Calibration Error Messages

CALIBRATION ERROR ##### calibration requires that the instrument remains motionless during the white cal. If the error persists and is not due to movement, the number that is displayed should be reported to X-Rite or an authorized service center.

NEED CALIBRATION - DUE TO ABORTED CAL, READ WHITE the user aborted the calibration procedure during measurement sequence.

NEED CALIBRATION - DUE TO BAD ZERO CAL zero reflectance calibration measurement was not properly updated.

Calibration Error Messages - continued

NEED CALIBRATION - DUE TO TEMPERATURE, READ WHITE a 10°C change in temperature occurred since the last calibration.

NEED CALIBRATION - DUE TO 4 HOUR FLAG, READ WHITE a calibration procedure has not been performed for 4 hours.

WARNING! - LARGE CHANGE, CHECK FOR DUST indicates excessive dust was detected in the optics or black trap, or internal drift of components occurred during a zero calibration. If this message does occur, check for dust in the optics or black trap. If no dust is present, the message may indicate normal instrument drift.

Miscellaneous Error Messages

BATTERY LOW- indicates that the batteries are getting low and will soon need to be charged. It will only be displayed while the measurement is in progress. The instrument will still take accurate measurements.

LAMP FAILURE - LAMP MUST BE REPLACED the lamp intensity is too weak for accurate measurements. The lamp should only be replaced by X-Rite or an authorized service center.

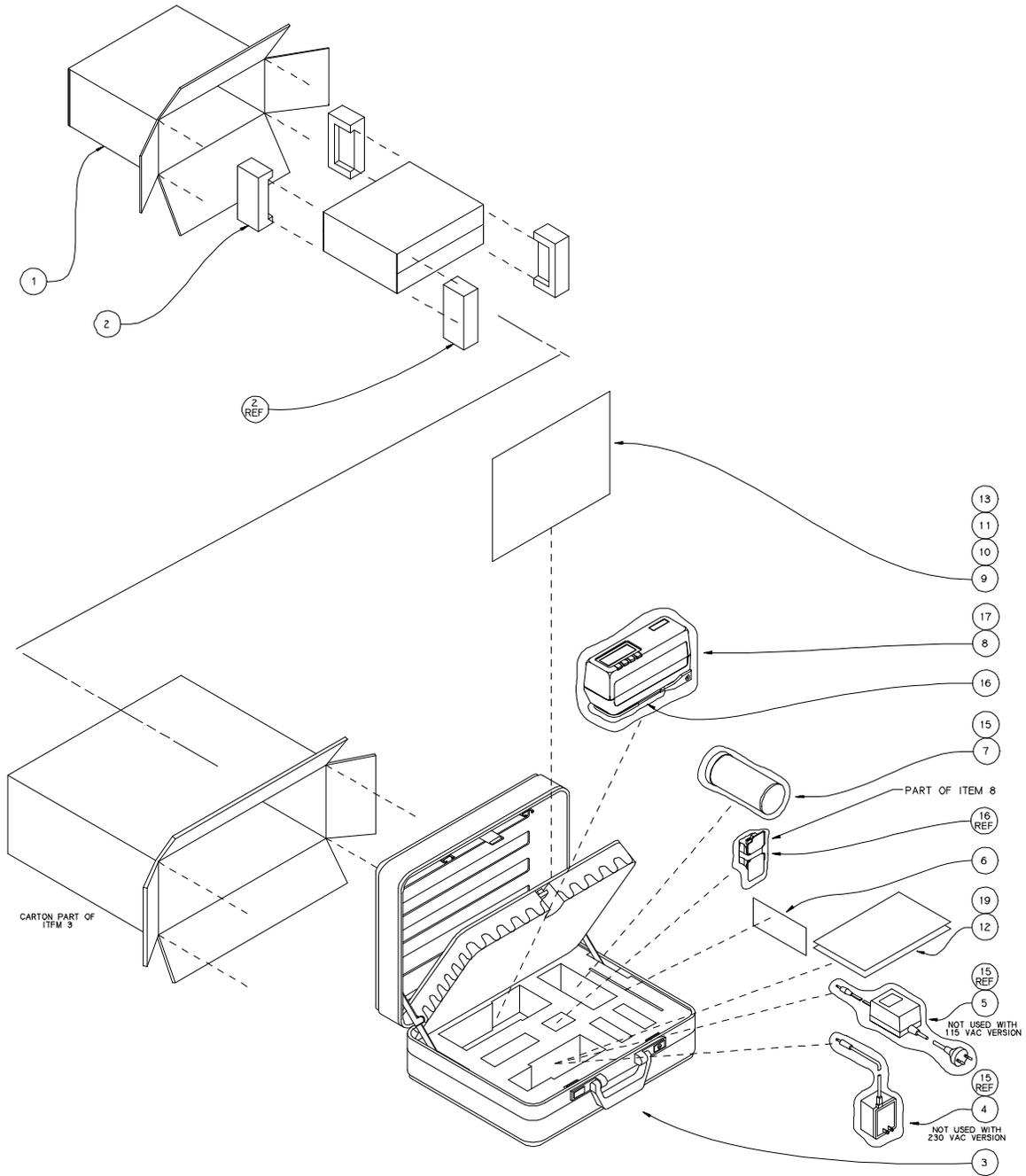
LAMP WARNING - REPLACE LAMP SOON the lamp is marginal and should be replaced as soon as is conveniently possible.

Parts List and Packaging Drawing

PARTS LIST

20	-	-	NOT USED	
19	1	1	SP68-513	BATTERY REPLACEMENT INSTRUCTIONS
18	-	-	NOT USED	
17	1	1	SD65-10	PLASTIC BAG
16	2	2	SD65-03	PLASTIC BAG
15	2	2	SD65-13	PLASTIC BAG
14	-	-	NOT USED	
13	1	1	SD43-SP68-62	REFLECTANCE LABEL
12	1	1	SP68-511	IMPORTANT NOTICE
11	1	1	SD01-04	WARRANTY REGISTRATION
10	1	1	SP58-500	OPERATION MANUAL
9	1	1	SD68-10	ENVELOPE
8	1	1	SP58-00-01	SPHERE SPECTROPHOTOMETER ASSY, 8mm
7	1	1	SP68-105-01	BLACK TRAP ASSEMBLY
6	1	1	SP68-62	REFLECTION STANDARD ASSY
5	-	1	SE30-62	AC/DC ADAPTOR 230 VAC, 50/60 Hz
4	1	-	SE30-61	AC/DC ADAPTOR 115 VAC, 50/60 Hz
3	1	1	SD67-06-01	INSTRUMENT CASE
2	4	4	SD200-MA58-02	CORNER PAD
1	1	1	SD200-MA58-01	CARTON
ITEM	QTY SP58	QTY SP58X	PART NUMBER	DESCRIPTION
PARTS LIST				

PACKAGING DRAWING



Color Check

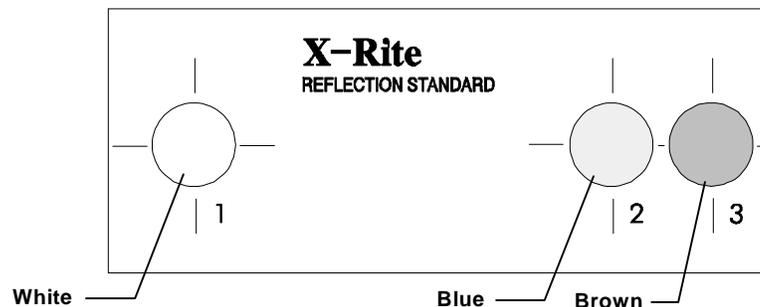
The color check procedure will help you track instrument color performance to assure measurement accuracy. Initially, the three patches on the standard should be measured once a day for a period of 10 days to determine the reference values. Thereafter, a periodic check (once a week depending on usage) is all that is required.

Located on the back of the reference standard envelope is a color check label. The reference data should be recorded there for quick reference.

Reference Data Procedure

To obtain reference values:

- 1) Clean instrument optics and reference standard if necessary.
- 2) Calibrate instrument according to procedure in operation manual. **Note:** The reference standard is dramatically affected by smudge marks and dust; and must be kept clean.
- 3) Select L*a*b* absolute function and desired illuminant/observer. **Note:** The selected illum/obs must be the same whenever the color check is performed.
- 4) Measure the White (1), Blue (2), and Brown (3) patches on the reference standard.



- 5) Record the L*a*b* values for each color on a piece of paper.
- 6) Repeat steps 1-5 for 10 days.
- 7) After 10 days average the white, blue, and brown values and enter data in the designated place on the color check label.
- 8) Enter date, illuminant, observer, aperture size, temperature, instrument model, and serial number on color check label. **Note:** Temperature of the reference standard should be maintained at $23 \pm 2^\circ\text{C}$ throughout color check sequence.

Periodic Color Check Procedure

- 1) Copy reference data located on the color check label to the shaded areas on the color check record located on the next page.
- 2) Perform steps 1-4 in reference data procedure.
- 3) Record the measured white, blue, and brown values and date on the color check record on the next page. Note: You may want to make several copies of the color check record before entering any data. This will allow you to have additional pages available when they are needed.
- 4) Compare measured values to the reference values.
 - If values are off, clean optics and reference standard and remeasure.
 - Consistent L*, a*, or b* differences exceeding .30 (or obvious trends away from the reference data) may require the unit to be serviced. Contact X-Rite or authorized service center if this is the case.
 - Always verify color performance with the same aperture size, illum/obs, and temperature.

