





9 3 9

S P E C T R O D E N S I T O M E T E R

## **Federal Communications Commission Notice**

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





Table of Contents

**Overview and Setup ..... 1-1**  
Instrument Description.....1-1  
Features.....1-2  
Unpac....1 5et2.....S..1 5et2.....S.lispect 1-1

Selecting Single or Multiple Items.....2-6

Selecting Color Data Parameters .....2-7

Instrument Indicator Light .....2-7

Important Measurement Techniques.....2-7









## Proprietary Notice

The information contained in this manual is derived from patent and proprietary data of X-Rite, Incorporated. This manual has

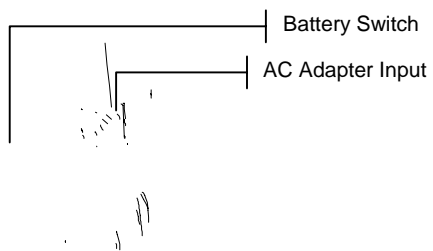


CHAPTER ONE

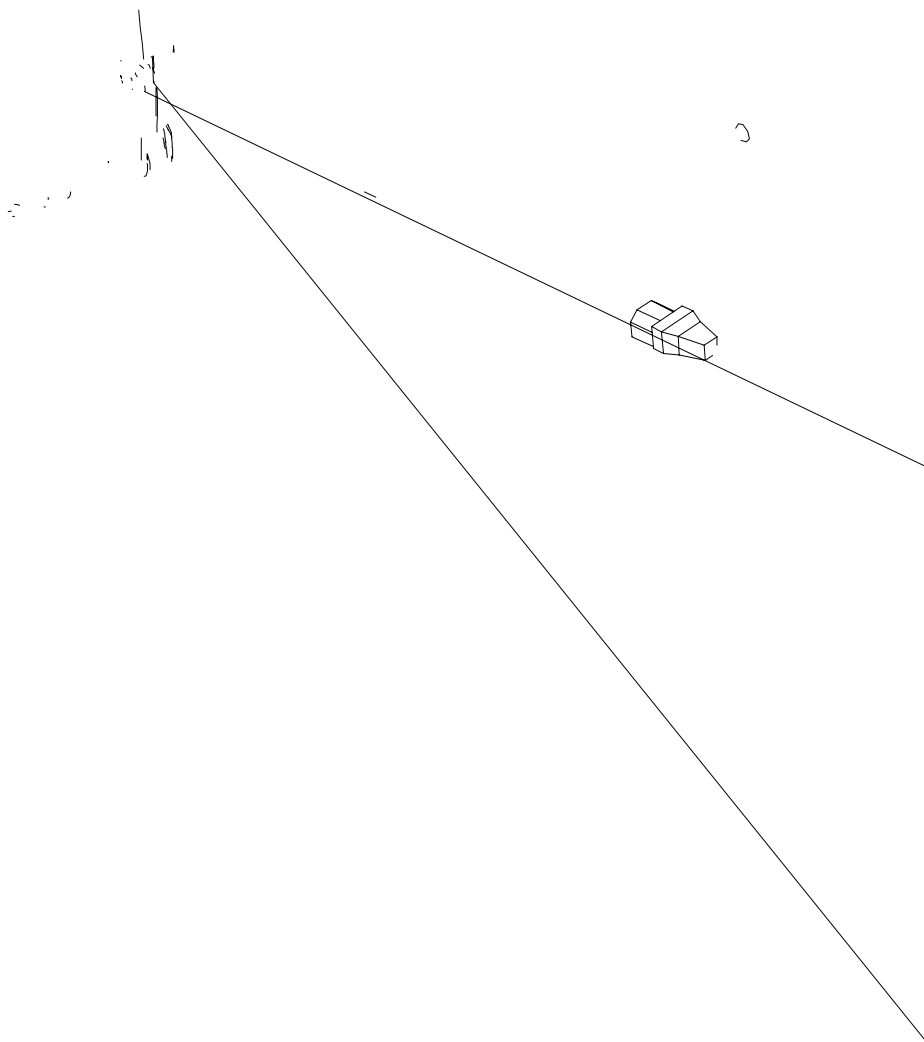
## Install the Battery Pack

The instrument is shipped from the factory with the battery pack removed. The battery pack is located in a carrying case compartment and must be installed before the instrument is used.

1. Hold the shoe next to the instrument housing and lift upward on the spring-loaded latch (*refer to Unlatching the Instrument Shoe*). Open the shoe perpendicular to the instrument housing.
- 2.



## OVERVIEW AND SETUP





**To latch the Instrument Shoe:**

1. Simply close the shoe to the instrument. The latch is spring-loaded and automatically latches to the shoe catch.

**Instrument I/O Serial Interface**

Your instrument can be connected to a computer or printer using a serial RS-232 interface cable and adapter. X-Rite carries a variety of adapters





## Colorimetric Screens

The QA, Analyze, Compare, Strength, and Opacity screens consist of three main areas: Data Storage Information, Color Data Parameters, and Color Data.

Proj 1: Cartons		
Std 1: Red Sample		
Sample: #10 11:23		
L*a*b*		+L* +0.05
D65/10	L* 88.25	+a* -0.03
	a* -4.71	+

.....

## **Densitometric Screens**

The Density, Dot/Tone, Trap, Hue/Grayness, and Print Contrast screens consist of five main areas: Function and Status, Color Option, User Dialog, Measurement List, and Measurement data.

### **Function and Status**

## **Opening a Menu or Mode**

Opening a mode or a menu gives you access to additional items related to the menu or specific information for a mode. Below

**To open the editor:**

1. Use the Tab keys \$@ to choose the desired digit or number (arrows above and below designate selection).
2. Press the Enter #









## CHAPTER THREE

# INSTRUMENT CALIBRATION

## CHAPTER THREE

# Setting Instrument Configuration

General Information	4-1
Language	4-1
Measure Options	4-2
Color Options	4-4
Density Options	4-10

## CHAPTER FOUR

## Store Samples

To select the store sample status:

1. Use the Tab keys \$@ to highlight **Store Samples**.

Measure Options















# CHAPTER FOUR

£# **Minus (-) Paper**



2. Press the Enter # key to access the Auto Color Mode menu.
3. Use the Tab keys \$@ to highlight the desired function option.
4. Press the Enter key # to toggle the option active or inactive. The > indicates the option is active.
5. After options are set, press Escape key ! to save and exit.

## Spec Dens/Dot

To select the spectral wavelengths:

1. Use the Tab keys \$@ to highlight Spec Dens/Dot.

Density Options
Current Status: T
Auto Color Mode...
Spec Dens/Dot...
- Paper Mode...
nFactor: 1.000
Trap Method: Preucil

2. Press the Enter key #

# SETTING INSTRUMENT CONFIGURATION







## Clear All Jobs

To clear all jobs:

1. Use the Tab keys \$@ to highlight **Clear all Jobs**.  
Database Tools

## CHAPTER FOUR

⌘# **Beeper** – Sets the volume of the beeper: Loud, Medium, Soft, or Off.

⌘# **Clock Adjust** – Used to adjust the internal clock of the instrument.

⌘# **Display** – Allows you to determine the following settings:

**Contrast** – Set the contrast of the display for optimal viewing. The setting can vary from 01 to 99.

**Orientation** – Determine whether you want the display viewable for right-handed (right) or left-handed (left) viewing. The setting can vary from 01 to 99.



## Serial Port







Clock Adjust	
Date Format: M/D/Y#	
Month	: 9
Day	: 05
Year	: 2000
Hour	: 8
Minute	: 21#

**Date Format Selection**

1. Use the Tab keys \$@ to highlight Date Format and press the Enter # key.
2. Use the Tab keys \$@ to highlight the desired date format:

## SETTING INSTRUMENT CONFIGURATION

## Orientation Selection

## **Load Factory Defaults**

The instrument can be reset to



CHAPTER FOUR

# Instrument Operation

## Selecting Standard Number

The standard number allows you to select existing standards for

2. Press the Enter key # to access the Standard Entry menu.



## INSTRUMENT OPERATION

attributes. Pass/fail indication appears in QA and Strength

- 8.** Use the Tab keys \$®



## CHAPTER FIVE

### NOTE

9. When all attributes have been edited for the selected color



## **Deleting the Standard**

This option deletes the current standard selected. While the

## INSTRUMENT OPERATION



**To access project name menu:**

1. Use the Tab keys \$@ to highlight **Proj Name**.

View Project :	1
Project Standards	
Proj Lock:Unlock	
Add New Project	
Delete This Project	

2. Press the Enter key # to access the Edit Project Name menu.

**NOTE:** "Project Is Locked" appears in the display when attempting to enter name with the project locked. Refer to Locking/Unlocking project.

**To change the locked status of a project:**

1. Use the Tab keys \$@ to highlight **Proj Lock**.

View Project :	1
Proj Standards	
Proj Name:	
<b>Proj Lock: Unlocked</b>	
Add New Project	
Delete This Project	

2. Press the Enter key # to toggle between Locked and Unlocked.

**Add New Project**





## Selecting a Project

## Tagging Samples

**NOTE:** Tags are attached to samples using an optional BCR (barcode reader). Storage Mode must be activated for tags to be applied.

Tags are used as a method of labeling samples for identification. The sample data can then be printed and/or uploaded to an X-Rite software program with tags attached. The instrument has three tagging possibilities to choose from.

☞

5. Place the instrument in **QA** mode and take a sample measurement with the instrument.

Bar Code Entry

## **555 Shade Sort Operation**

The 555 Shade Sort function displays a three-digit number for the sample on the instrument screen, based on the shade size and shade range. Pass/Fail operation can also be used in conjunction with Shade Sort if required. The Shade Sort option

Words will not display for an attribute that is less than  $1/7^{\text{th}}$  of the  $\div E$  value. A value less than this amount is considered insignificant compared to the total difference.

If the delta value for any attribute is greater than “10.00”, the display changes to numeric values.

The Difference Display option must be set to “Words” in the Instrument Configuration.

Proj 1: PROJECT A	
Std 2: STANDARD B	
Sample: #3 12:05	
L*a*b*	Darker
D65/10	>> Red
	>> Yel
	$\div E$ 0.86

Storage Operation

When the storage function is activated in the instrument configuration, sample measurements are saved to the database with a number and a time stamp14(t)1.4( )al e function is 042.6r(ber and

## Measurement Averaging

CHAPTER FIVE











## **Opacity Measurement**

The Opacity function displays the percent opacity of a drawn down sample on an opacity card. Color difference data is also displayed if difference is activated in the configuration.

**To perform an opacity measurement:**

- 1.**

## CHAPTER FIVE

## INSTRUMENT OPERATION

CHAPTER FIVE





And, if you set the density options to All, your measurement data appears like this:

Density T		VCMY
<Measure Density>		
Paper	V	1.220
Density	C	1.422
	M	1.113
	Y	1.023

## **Dot/Tone**



## **Measuring Dot/Tone Procedure**

So far, you have performed the procedures to select the color





## Hue/Grayness

The instrument can report hue error, grayness, and saturation with or without paper subtracted. Hue/Gray measures the selected ink through all three filters (cyan, magenta, and yellow). Paper mode is selected from the Density Options menu, located in the Configuration menu (*refer to Section Four*).

Hue error, grayness, and saturation are calculated using the following formulas.

$$D_{FW} = \frac{D_{CY} + D_{MG} + D_{YL}}{3}$$







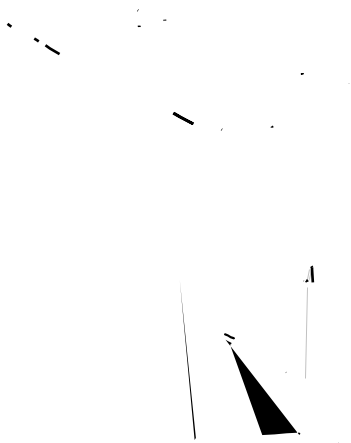


CHAPTER FIVE

# Service and General Maintenance

Repair Information

6-1



## **Replacing the Battery Pack**

1. Unplug the AC adapter and click the battery switch to Off.
2. Hold the shoe next to the instrument housing and lift upward on the spring-loaded latch. Open the shoe







## Error Messages

## Changing the Aperture

The instrument was designed to allow you to quickly change the aperture and target window. X-Rite provides three aperture kits especially designed for the instrument. *Available kits:* 4mm, 8mm (standard), and 16mm.

*Refer to the next page for illustrations.*







X-Rite, Incorporated—World Headquarters  
3100 44th Street S.W. • Grandville, Michigan 49418 • USA  
[www.x-rite.com](http://www.x-rite.com)