
Datacolor

Datacolor 245™

User's Guide



Datacolor 245™ User's Guide (January, 2005) Part No. 4230-0393M

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Datacolor 245™

About the Datacolor 245™

The Datacolor 245 provides a new, solid-state approach to 45°/0° measurement geometry. It employs a unique, dual-beam optical design, uses a pulsed xenon lamp and has a sealed optical path for improved repeatability and long-term stability. 45°/0° instruments are used for quality control applications when both color and appearance features are being evaluated.



The Datacolor 245 includes the following standard features:

- Dual-beam measurement using pulsed xenon light source
- Datacolor proprietary high-end sensor
- Conformance to ASTM E1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation
- Drawer for accessories
- Datacolor world wide support

Electrical and Environmental Requirements

Power	85 to 264 VAC 47 to 63 Hz 80 VA peak 35 VA typical
Absolute Operating Environment	5° to 40° C 65%-85% RH, non-condensing

Safety Warnings

Light Source

Do not stare directly into the open port located in the front door panel when the measurement is in progress. **Staring directly into the light source can result in eye discomfort similar to that of staring at a camera flash.**

Side Vents

 Vents are included along each side of the instrument to facilitate air circulation. **HIGH VOLTAGE COMPONENTS WITHIN.** DO NOT INSERT ANY OBJECTS INTO THESE OPENINGS!

Feature Summary

The Dataflash is one of a family of Datacolor instruments that employs state-of-the-art features including the spectrometer, light source, and optics. Below is a summary of those features:

FEATURE	DESCRIPTION	PURPOSE/BENEFIT
Instrument Type	Dual-beam spectrophotometer with xenon flash lamp	Industry standard.
Measurement Geometry	45° illumination 0° viewing	Results provide good agreement with visual evaluations of sample color.
SP2000 Spectral Analyzer	Proprietary dual-channel holographic grating. 256-photodiode linear arrays used for both the reference and sample channels.	Dual channel design provides continuous monitoring of sample illumination and compensates for changes. 256-photodiode array enhances the precision of the measurement.
Light source	Pulsed xenon flash lamp	Does not require warm up
Effective Bandwidth	10nm	Greater precision enhances the measurement accuracy.
Wavelength Range	400nm to 700nm	
Reporting Interval	10nm	

Accessories

All models come with the following standard accessories:

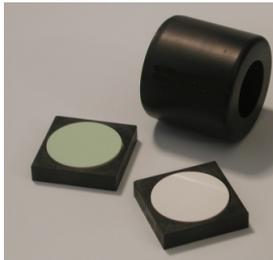
- Six foot power cable
- Serial cable with connectors on either end
- USB cable
- Black Trap
- White Tile
- Green Tile

In addition, an optional accessory drawer is available with the unit.

Calibration Tiles

A black trap, white tile and green tile are provided with Datacolor instruments.

- The black trap and white tile are used each time the instrument is calibrated.
- The green tile is used to perform an optional diagnostic test.



Calibration Data

The calibration procedure uses white data that must be installed on the system. It is data unique for the white calibration tile, and is provided on either a diskette or a CD. It is included with the instrument accessories:



NOTE

The serial number on the back of the white calibration standard should match the serial number on the instrument.

Aperture Plates

The Datacolor 245 is a single aperture instrument. *Refer to Appendix, Features by Model for the aperture specification.*

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Cable Installation

Instrument Cables

⚠ WARNING

BE SURE TO TURN OFF THE POWER BEFORE WORKING WITH ANY CABLES.

The Datacolor 245 requires the use of two cables, a power cable and either a serial cable or a USB cable, to connect the instrument to the computer.



⚠ WARNING

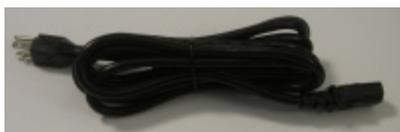
Read "Electrical and Environmental Requirements section *before* connecting your instrument.

The connections for these cables are found on the back of the instrument.



Power Cable

A six-foot power cable is provided with the instrument.

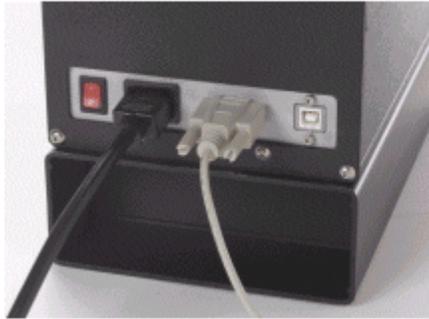


Power is supplied to the back of the unit via a 3-prong male connector.

Communications Cable

The instrument is connected to a computer through either a serial port or USB port:

Serial Cable Connections



USB Cable Connections



1. Plug the female end of the power cord into the power receptacle on the rear panel of the instrument. Insert the plug into a standard AC outlet.
2. Connect the male connector on the instrument cable to the appropriate female connector on the rear panel of the instrument.
3. Connect the female connector on the instrument cable to a communications port on the back of the computer.



4. Tighten each connection securely to ensure proper signal.

NOTE

If there is more than one serial port on the computer, make a note of the port being used. You may need to enter this information into the program.

See USB Driver Installation in this guide for detailed instructions regarding the software installation. See the Appendix for a description of the RS-232C connector pin assignments.

USB Driver Installation

Installing the Driver

To connect to a USB port, additional software must be installed.

1. Install the CD labeled *USB Drivers and Documentation* into the CD ROM drive.
2. Connect the USB cable to the instrument, and to the USB port on the computer. When this connection is made, the system detects a new piece of hardware, and the screen below automatically appears:



The New Hardware Wizard automatically replaces this screen.



3. Click **Next** to continue with the USB driver installation.



4. Accept the default selection and click **Next**.



A check appears in the box for a selection. There should be a check in both the *CD-ROM drives* box and the *Specify a location* box.

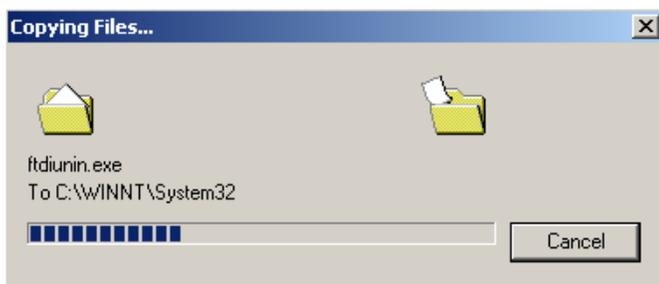
To add a check, place the cursor in a blank box and click the mouse. A check will appear. To remove a check, place the cursor over a check, and click the mouse. The check will disappear. When you have completed your selections, click **Next**.



5. A default location appears in the "Copy manufacturer's files from" field.
 - If the driver software is in a different location click **Browse**, and identify the correct location.
 - If the correct location is identified, click **OK**. The program will search for the driver file. When the correct file is found, the window below appears:



Click **Next**. The Wizard will begin copying the files to the computer.



6. When the copy is complete, the window below appears:



7. Click **Finish**. **Do not remove the USB Driver CD from the drive.** The Wizard will close, and then immediately reopen and repeat the procedure. You must complete it a second time to successfully copy the file.



8. Click **Next**.



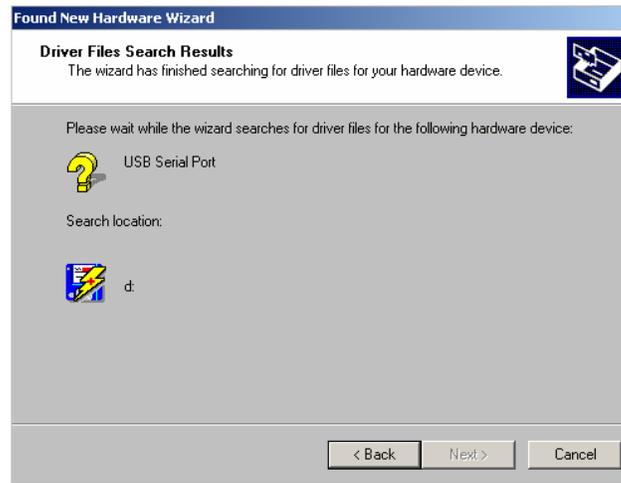
9. Click **Next**.



- Place a check in the CD-ROM drives and the **Specify a Location** box. Then click **Next**.



- If the CD drive containing the files is displayed, click **OK**. If it is not displayed, click the **Browse** button, and locate the CD drive on your system.



- Click **Next**. The Wizard will begin copying the files to the computer. When the copy is completed, the window below appears:



- Click **Finish**.

Viewing/Changing System Port Assignment

As part of this process, a port number is assigned to the USB port. The default selection is the next available com port. Depending on the application you are running, you may need to know this port assignment to configure the Datacolor applications program(s) to recognize the USB port.

NOTES

Some Datacolor programs automatically configure the USB port assignment. Others require that you manually assign the port number. Refer to the program User's Guide for information to assign/edit the instrument port number.

If you change the USB port you are using for the instrument, you must edit the com port assignment in the Datacolor programs.

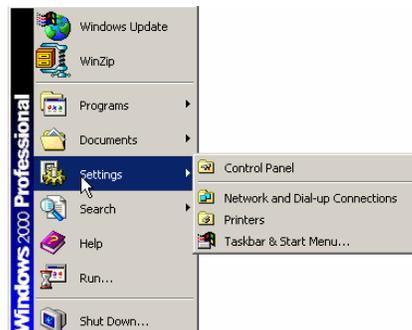
The procedure for viewing/editing the com port assignment is as follows:

To view or change the com port assignment for the USB port, you must do the following:

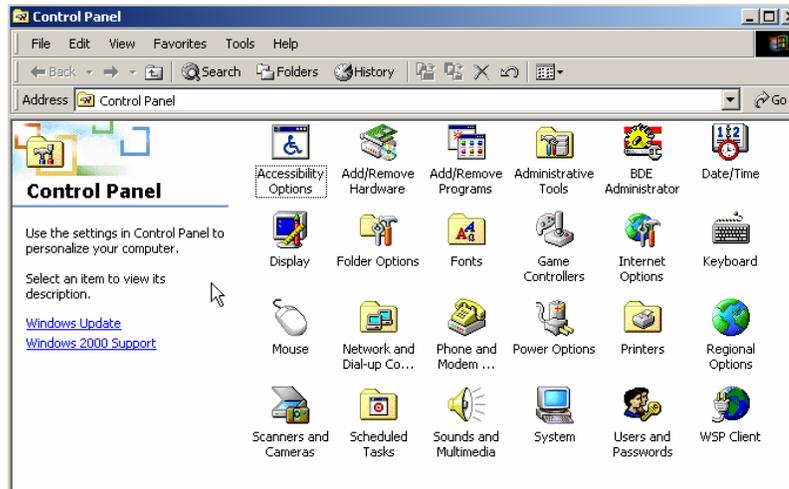
1. Open the Control Panel by clicking the **Start** button at the bottom left of the screen.



The Start menu displays.



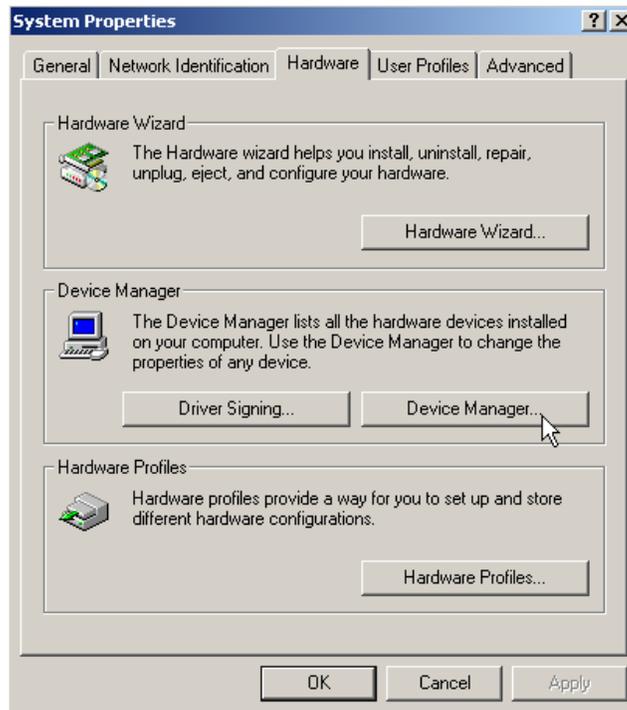
2. Place the cursor on *Settings* so that the program submenu appears, and click **Control Panel**.
3. When the Control Panel window displays, double-click on **System**.



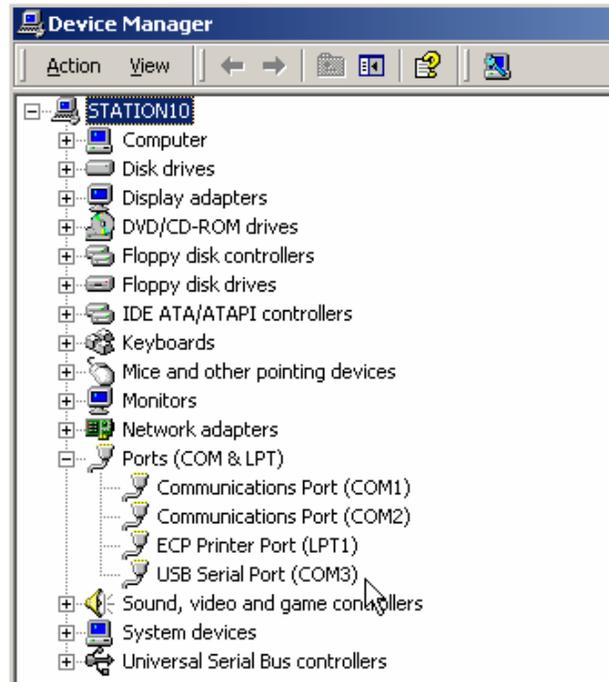
The Systems Properties dialog box displays.



4. Click the **Hardware Tab**.

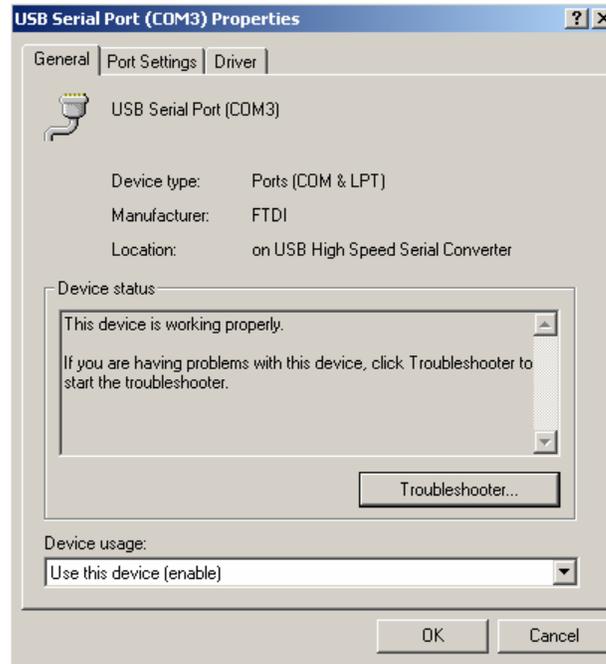


5. Click the **Device Manager** button. The Device Manager window displays.

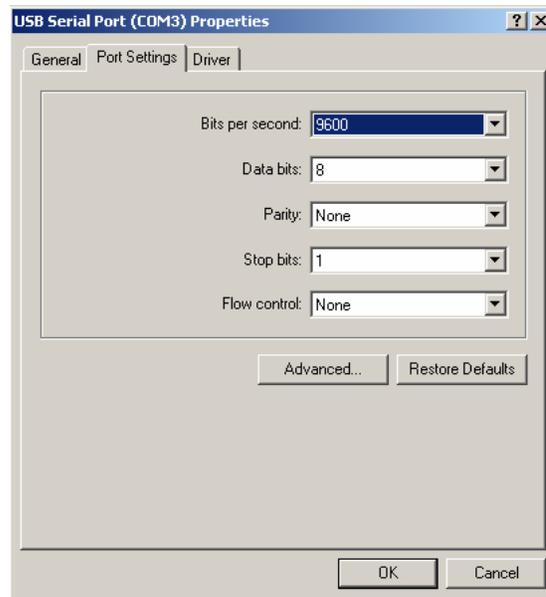


6. Go to the **Ports** heading. Click on the plus (+) to display the port selections.

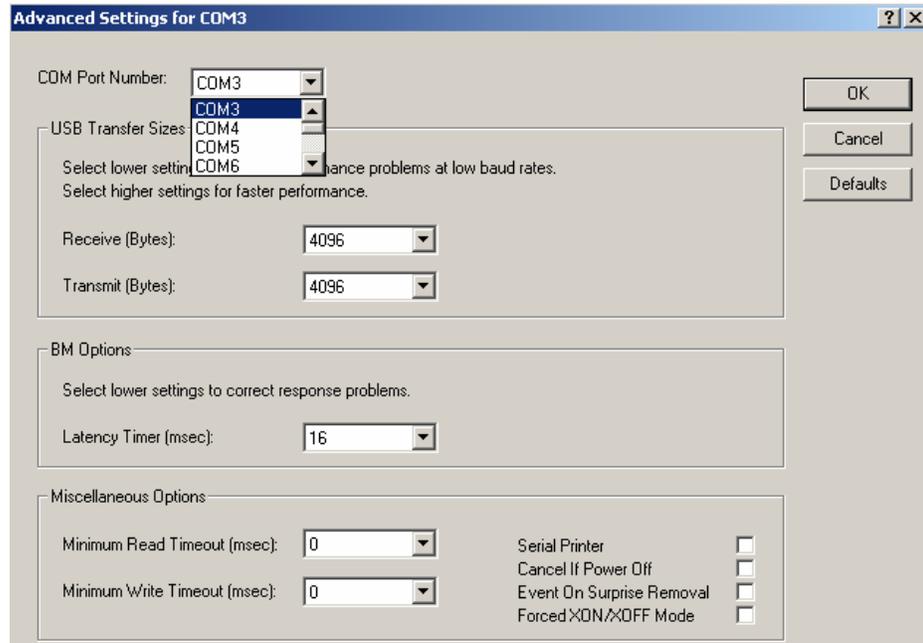
7. Click **USB Serial Port**. The USB Serial Port (COM3) Properties dialog box displays.



8. Click **Port Settings**. The dialog box below appears:



- Click the **Advanced** button. The Advance Settings for COM3 dialog box displays.



- The field labeled *COM Port Number* displays the current assignment for the USB port. To change the port setting, click the drop-down list arrow. The list of COM ports is displayed.
- Click on the port assignment to be used for the USB port.
- When you have completed the changes, click **OK**.

Changing the COM Port Assignment in Datacolor Programs

To enable the USB port for color measurements, you may need to change the com port assignment in the applications program. Refer to the program documentation for the specific Datacolor applications program you are running for instructions to configure the instrument.



NOTE

If you are installing a new instrument, this is found on **a diskette included with the calibration tiles.**

Installing Calibration Data

See the program documentation for instructions to install the calibration data.

Controls and Indicators

Status Panel

The status panel indicates the current instrument settings being used. Below is the status panel for the Datacolor 245™:



OPTION	DESCRIPTION
Measuring	Instrument is making a measurement. Do not remove the sample from the port when this indicator is lit.
Ready	Instrument is ready for use.

Powering Up

Use this simple procedure to start using your Datacolor 245.

1. Verify all cable connections. The AC power cord should be plugged into an outlet. The instrument cable should be attached to the instrument and host computer.



2. Turn on the host computer.
3. Turn on the power switch. It is the red switch on the back of the instrument.
 - When power is applied, all mechanisms are automatically reset.
 - The lights on the status panel will flash, and then the Ready light will stay lit.



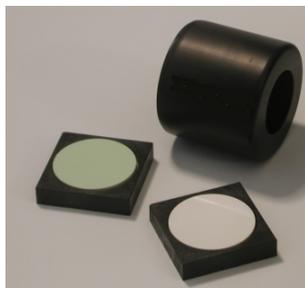
NOTE

If the instrument power is not turned on before a Datacolor program is launched, you may receive an error message.

4. When the *Ready* light remains on, your instrument is ready to use.
5. Launch a Datacolor program.

Instrument Calibration

The instrument should be calibrated every 8 hours to compensate for changes in the environment. A black trap, white tile and green tile are provided with all Datacolor instruments to complete the calibration:



- The black trap and white tile are used each time the instrument is calibrated.
- The green tile is used to perform an optional diagnostic test.

The software prompts for calibration vary from one program to another. The Datacolor Users Guide for the program you are running provides step-by-step instructions regarding the software setup and instrument calibration procedure.

 **NOTE**

It is recommended that you calibrate the instrument every 8 hours.

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Sample Presentation and Measurement

About Sample Presentation

You must pay close attention to the positioning of the sample to insure an accurate measurement. When positioned correctly, the sample rests between the sample holder and the front panel door. The sample must completely cover the aperture opening.

1. Grasp the sample holder and pull forward.



2. Position the sample at the port. The sample should completely cover the port opening.



3. Carefully return arm to normal operating position.



⚠ WARNING
Do not allow sample arm to spring back.

Sample Viewing Port

When measuring small samples, you may need to check that the sample is properly positioned at the port. To verify that the correct area of the sample is being measured:

1. Grasp the tab above the aperture plate.



-
2. Pull top of door down to its full horizontal position. The backside of this door reveals the area of the sample covering the port opening.



-
-
3. If necessary, adjust the placement of the sample to target the portion of the sample to be measured. The sample must completely cover the port opening.
4. Push the door back to its normal position, and start the measurement.



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Maintenance

About Instrument Maintenance

The sections that follow provide detailed instructions for maintaining the instrument and calibration tiles. These instructions and tips will help to insure that the instrument continues to perform properly over its life.

Tile Handling and Cleaning

Handling Tiles

- Handle calibration tiles with **extreme care**. Do not drop them, or scratch the glazed surface.
- Always grasp the tile using its edges.

Cleaning Tiles

- The calibration tiles should be cleaned before each use. Wipe each tile clean with a soft, lint-free cloth.



- A detergent, free of optical brighteners, fluorescent materials or photoactive dyes should be used as needed to clear any oils, fingerprints, or other deposits. Liquid dish detergent is a suitable detergent. The detergent/water solution should be prepared as follows: **1 part detergent: 250 parts water**
- Use a few drops of the detergent solution to moisten a soft, lint-free cloth, and gently wipe the tile surface. Rinse the detergent from the tile by wiping it with a cloth, moistened with clean water.

- **NEVER** use abrasive cleansers, razor blades, or other metal objects to remove dirt or foreign substances from the calibration tiles. This will damage the tile surface.
- **NEVER** immerse the tiles in water.
- Tiles that have scratches, chips, abrasions or cracks must be replaced. Signs of wear on the tile surface will affect the accuracy of the calibration.

Storage

- Large temperature variations will affect the accuracy of your calibration, requiring more frequent calibration. The calibration tiles should be stored in an environment that simulates the temperature of the samples to be measured.
- Prolonged exposure to sunlight or other sources of ultra-violet radiation will cause the color of the tiles to change. The tiles should always be stored in a protective case or container away from direct sunlight and environmental contaminants.

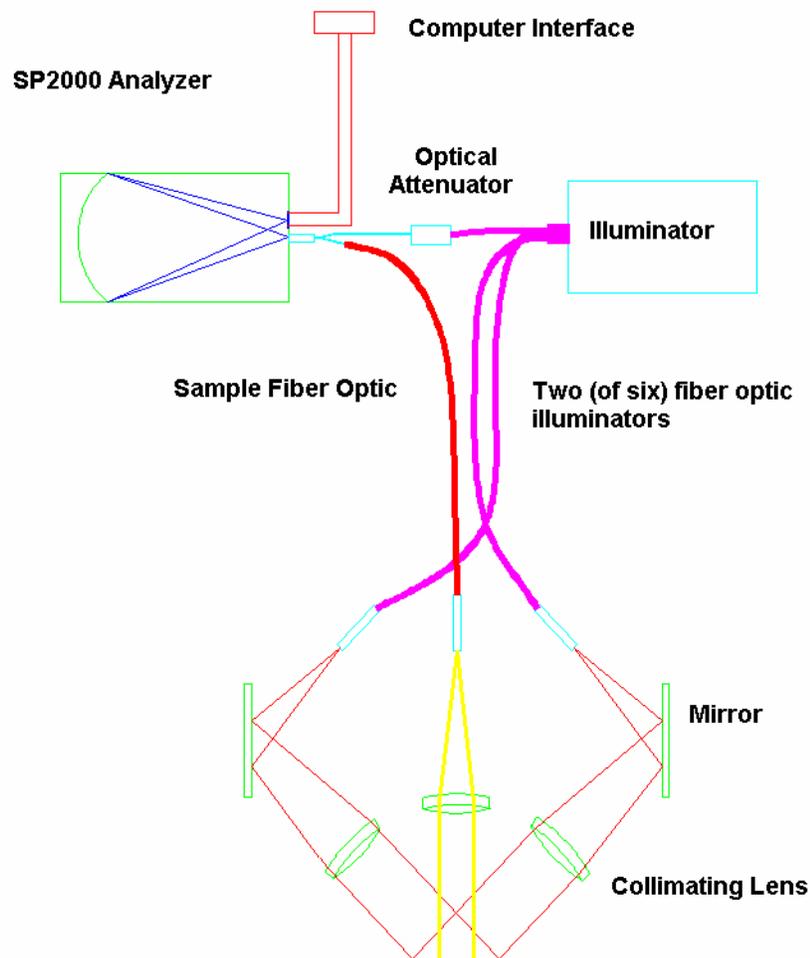
Cleaning the Black Trap

- The black trap should be kept dust-free. Dust accumulating in the black trap should be blown out with compressed air.



Appendix

Datacolor 245™ Optical Block Diagram



Instrument Specifications

Specifications are subject to change without notice.

ITEM	DESCRIPTION	
Instrument Type	Dual beam reflectance spectrophotometer.	
Measuring Geometry	45° illumination, 0° viewing in conformance with ASTM E1164-02, and Level B instrument following the CIE Technical Committee 2-39 proposal.	
Illumination Source	Pulsed xenon	
Spectral Analyzer	Proprietary SP 2000 analyzer with dual 256-diode array and high-resolution holographic grating.	
Wavelength Range	400 – 700nm	
Reporting Interval	10 nm	
Effective Bandwidth	10nm	
Photometric Range	0 to 200%	
Aperture Configuration	16mm illuminated 11 mm viewed	
Power	100 to 240 VAC 47 to 63 Hz 80 VA Peak 35 VA Typical	
Performance—Repeatability* 20 reads, using dual flash	0.03 (max)CIELAB on white ceramic	
Performance—Inter-Instrument Agreement*	0.2 CIELAB ΔE (max) 0.1 CIELAB average	
Absolute Operating Environment	5° to 40° C, 5-85% RH, non-condensing	
Interface	RS232 9600/19200 baud ~or~ USB 1.1 or higher	
Warranty	1-year parts and labor. Extended warranty available.	
Dimensions (without drawer)	English	Metric
Height	6.5 inches	165.1 mm
Width	6.75 inches	171.5 mm
Depth	12.375 inches	314 mm
Weight	14 lbs.	6.3 kg

* Specification based on following environmental conditions: 20°C; 50% RH; 2 sigma

Miscellaneous Technical Information

RS-232C Connector Pin Assignments

<u>Pin #</u>	<u>Purpose</u>	<u>Direction</u>
2	Transmit data	Out (to host)
3	Receive data	In (from host)
7	Signal ground	

WARNINGS

- (1) *DO NOT WIRE* to pins other than 2, 3, and 7.
 - (2) For all unused inputs, the default is active high.
-
-

Safety Warnings

Light Source

Do not stare directly into the open port located in the front door panel when the measurement is in progress. **Staring directly into the light source can result in eye discomfort similar to that of staring at a camera flash.**

Side Vents

 Vents are included along each side of the instrument to facilitate air circulation. **HIGH VOLTAGE COMPONENTS WITHIN.** DO NOT INSERT ANY OBJECTS INTO THESE OPENINGS!

Compliance Statements

FCC Compliance Statement

 **WARNING**

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 this User's 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 or her own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Compliance Statement

English

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Français

El présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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