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**Datacolor Spectro 1000™**  
**Datacolor Spectro 700™**  
**Datacolor Spectro 1050™**  
**Datacolor Spectro 750™**  
**User's Guide**



**Datacolor Spectro 1000, Datacolor Spectro 1000V, Datacolor Spectro 1000X, Datacolor Spectro 1050, Datacolor Spectro 700, Datacolor Spectro 700V, Datacolor Spectro 750 User's Guide**  
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**Support Questions?**

If you need help with a Datacolor product, please contact one of our top-rated technical support teams listed in the appendix for the Datacolor office in your area.

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# Datacolor Spectrophotometers

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## About the Datacolor Spectro 1000 Spectrophotometer

The Datacolor reference-grade benchtop Datacolor Spectro 1000 spectrophotometer is the newest generation of benchtop color measuring instruments, incorporating an improved integrated circuit technology in the instrument design. The Datacolor Spectro 1000 is intended for use as a device for measuring, specifying and evaluating color in both laboratory and production settings, especially where precise digital color communication is required. Additional configurations of this instrument, including the Datacolor Spectro 1050, 750, and 700, are described in the following section of this manual: Features of the Datacolor Spectro 1000 and Related Configurations.



### Datacolor Spectro 1000

Below is a summary of the standard and optional features included with the instruments.

**Standard** features include the following:

- Pulsed xenon light source
- Multiple aperture sizes to accommodate samples of different sizes
- Automated specular port
- Integrated camera and viewing display for precise sample positioning
- Automated aperture detection
- Automated zoom lens
- Automated, adjustable ultra-violet filters for measuring fluorescent samples
- Infrared thermometer for recording sample temperature at time of measurement.

## Electrical/Environmental Requirements

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<b>Input Power Requirements</b>	Input Voltage: 100-240VAC Voltage Fluctuations: +/- 10% Number of Phases: Single Frequency: 50/60 Hz Power Rating: 80VA
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<b>Operating Environment</b>	<b>Temperature:</b> 5°C to 40°C <b>Maximum Relative Humidity:</b> 20%-85% non-condensing <b>Altitude:</b> Up to 2,000 meters Do not store above 140°F (60°C) Indoor Use (IPXO), Pollution Degree 2 Do not crush, short circuit, mutilate, reverse polarity, disassemble, or dispose. In fire, might cause burns or release toxic materials.
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<b>Interfaces</b>	USB: 2.0 Ethernet
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## Safety Features

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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 **CAUTION**

There are no user-serviceable parts for this equipment.

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### ***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.**

**Ensure that an aperture plate is installed prior to calibrating the instrument or performing measurements.**

### ***Power***

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 **CAUTION**

Disconnect power before servicing.

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The power cord supplied with the unit *must* be used to connect to an earthed (grounded) power supply.

Position the product such that the AC power cord that attaches to the rear of the unit is easily accessible and can be disconnected if required.

Servicing of this instrument is to be performed only by qualified Datacolor personnel. **DO NOT** remove bottom cover screws to expose internal components. The following warning is located on the bottom cover:

HIGH VOLTAGE  
DO NOT REMOVE SCREWS  
ONLY TO BE OPENED BY  
QUALIFIED SERVICE PERSON

### ***Instrument Handling***

This instrument is intended for use on a stable benchtop and is not meant to be a portable instrument. In cases where it must be physically moved, two persons, each using two hands is recommended.

## Feature Summary

These instruments employ state-of-the-art features including the spectrometer, integrating sphere, light source, and optics. Below is a summary of those features:

FEATURE	DESCRIPTION	PURPOSE/BENEFIT
<b>Integrating sphere</b>	Barium coated sphere.	Industry standard.
<b>Measurement Geometry</b>	D/8° geometry, Specular Component Included (SCI) or Excluded (SCE).	Provides for more uniform measurement of samples with irregular surfaces.
<b>SPX Spectral Analyzer</b>	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.
<b>Light source</b>	Pulsed xenon	Filtered to provide D65 illumination including UV component.
<b>Effective Bandwidth</b>	10nm	Reliable Spectral data for determining color and color difference.



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## Accessories

All models come with the following standard accessories:

- Power cable
- USB Cable with ferrite
- Black Trap
- White Tile
- Green Tile
- White Tile Calibration data on USB Memory Stick

### Calibration Tiles

A black trap, white tile and green tile are provided with all 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.
- USB Memory Stick containing the calibration values for the white tile and User Guide



### Aperture Plates

Multiple aperture plates with openings of different sizes are included as standard accessories with all models. The identification is engraved on each plate.

The aperture plates listed below are provided with every model (unless identified as optional):

- Large Area View (LAV)
- Medium Area View (MAV) (Optional)
- Small Area View (SAV)
- Ultra-Small Area View (USAV)
- Extra Ultra Small Area View (XUSAV) (Optional)

Below are aperture plate specifications:

Aperture Identification	Sample Area Measured	Sample Area Illuminated
LAV	26mm	30mm
MAV	16mm	20mm
SAV	5mm	9mm
USAV	2.5mm	6.5mm
XUSAV	2.5mm	3.0mm

 **NOTE**

The area illuminated is always 4mm greater than the diameter measured to reduce translucency errors. The exception to this is the XUSAV plate.



**Tips for Aperture Selection**

- Always use the largest possible aperture size.
- The Large Area View (LAV) plate is recommended for averaging samples with irregular surfaces and textured samples.
- Small (SAV) and ultra-small (USAV) plates should only be used for measurements of samples that do not completely cover the opening of the larger aperture plates.
- Medium (MAV) with barium coating must be used for transmission measurements.

**Optional Accessories**

There are additional accessories available for the following models.

- DC 5x0/7x0/8x0/10x0
- DC 550/750/850/1050

Instrument	Part Number	Description	Image
DC 5x0/7x0/8x0/10x0	3775-0260	MAV Aperture Plate	
DC 5x0/7x0/8x0/10x0	3775-0259	XUSAV Aperture Plate	

DC 5x0/7x0/8x0/10x0	1035-0004	Textile Skein Holder	
DC 5x0/7x0/8x0/10x0	1200-1159	Glass Aperture Plate – LAV *	
DC 550/750/850/1050	2950-0125	Cuvette 10mm	
DC 5x0/7x0/8x0/10x0	1035-0191	Compression Sample Holder	
DC 550/750/850/1050	2950-0004	10mm Transmission Cell	
DC 5x0/7x0/8x0/10x0	1200-1647	Terrycloth Fixture Kit	
DC 5x0/7x0/8x0/10x0 Horizontal	1200-1472	White Backing Tile w/Data	
DC 5x0/7x0/8x0/10x0	1200-1659	Grey Backing Tile W/O Data	

\*Glass aperture does not work with temperature sensor.

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## Aperture Up Configuration

The Datacolor Spectro 1000 series includes an option to measure on instrument with sphere up. The Datacolor Spectro 1000X can measure solid or liquid samples with samples placed on top of the instrument.



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## Transmittance Options

The Datacolor Spectro 1050/750 includes an option to measure the transmission properties of transparent and translucent samples. The 1050/750 can measure the “regular” transmittance of transparent solid and liquid samples, as well as the “total” and “diffuse” transmittance of translucent samples. The Datacolor Spectro 1050/750 can also be used to perform the following evaluations:

- Haze evaluations, in compliance with ASTM D1003 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics, for materials that exhibit slight light scattering.
- APHA evaluation, which measure the yellowness of liquids.

The transmission compartment of the Datacolor Spectro 1050/750 is large enough to allow the operator to easily insert and remove samples. It has been fitted with a spill tray in the event of minor spillage of liquid samples.

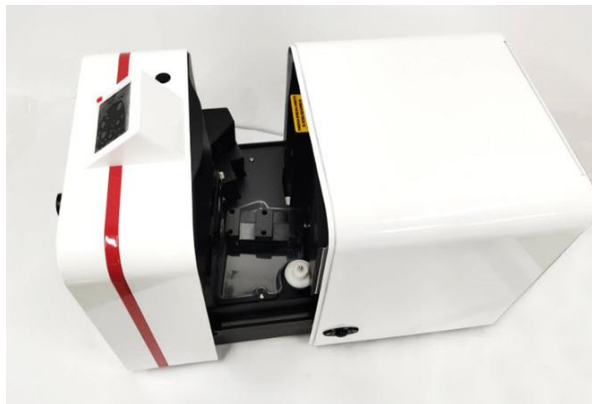
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## Accessing the Transmission Compartment

There are side-latch buttons on each side of the Datacolor Spectro 1050/750 case that are used to open the transmission case:



Depress these buttons and slide the case toward the back of the instrument, to open the transmission compartment. Reverse the process to close the transmission compartment. The case will lock in the Open and Closed positions:




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## Transmission Accessories

The following accessories must be installed in order to perform transmission measurements:



**Transmission Sample Holder Base.**  
Used to mount the Transmission Sample Holders. Installed at the factory.

**Transmission Sample Holders.**  
Installed as required by user.



**Spill Tray.**  
Installed at factory to catch minor spills.



**NOTE**

The cuvette holder is designed to hold an optical glass cuvette 50mm X 10mm (Datacolor Part No. 2950-0004).

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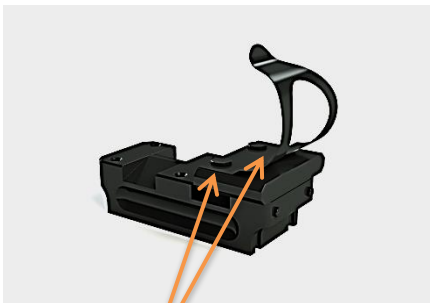
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## Transmission Sample Holders

Two sample holders are provided to accommodate various types of transparent samples.

### Solid Sample Holder



Two thumb screws provide the ability to adapt the holder to samples of varying thicknesses.

### Cuvette and Cuvette Holder (Liquid Samples)



This holder is designed for use with a 50mm X 10mm optical glass cuvette.

These sample holders are mounted onto the transmission sample holder base via two dowels protruding from the bottom of the holders.



**Dowel Pins**

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 **NOTES**

Loosen the thumbscrews on the solid sample holder to aid in the installation of the sample holder. Make sure the sphere opening/lens opening is completely covered by the sample you are going to measure. No special tools are required to install the sample holders.

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**Transmission Sample Holder Base**



**Position 3.** Places the sample close to the lens. It is used to measure regular transmission of transparent materials.

**Position 2.** This is provided for ease of handling when measuring regular transmission. Can only be used with the cuvette holder.

**Position 1.** Places the sample close to the sphere. Used to measure translucent samples and to make haze measurements.

The base is installed at the factory and includes three positions to locate the sample between the sphere and the lens.  
The location of the sample holder along the base depends upon the type of material being measured.



#### **NOTES**

The base should remain in the transmission compartment, but the sample holders (Solid or Cuvette) must be removed for Reflectance calibration and measurement.

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# Cable Installation

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## Overview

You must install a power cable and an interface cable (either a USB ***or*** an Ethernet cable) to connect the instrument to a computer.



**Do not connect all interface cables to the unit.** You have a choice of using an Ethernet cable or a USB cable.

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



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

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## Power Cable

A power cable is provided with the instrument.



The power cord supplied with the unit ***must*** be used to connect to an earthed (grounded) power supply.

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

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.

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## USB Cable Installation

Instruments manufactured by Datacolor can be connected to a USB port on a desktop system. See *Appendix, System Requirements for USB Connection* before you attempt to connect to a USB port.

You can connect the instrument to the computer using **either** an Ethernet cable, **or** a USB cable. Select one of them. This section provides instructions for using the USB cable.

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### NOTES

Do not connect all interface cables to the unit at the same time.

If you use the USB cable, you may need to install additional software to activate the USB port. See also *Driver Installation* below for instructions to add this software.

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### Before You Begin

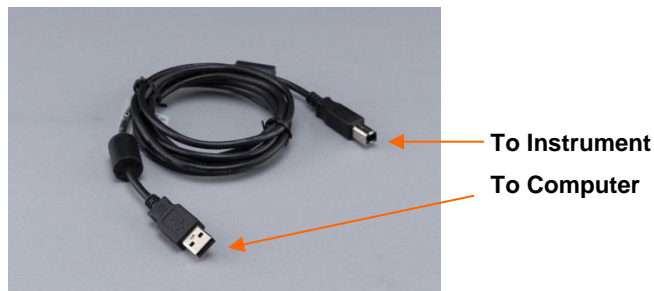
- Close all programs currently running on the system.
- You will need the accessories listed below to complete the installation:
  - USB cable (provided by Datacolor).
  - USB Memory Stick included with the instrument (this is required only when installing new instruments)

Three steps must be completed to enable the USB port for use with the instrument:

- Install the USB cable (as shown below).
- Identify the COM port assignment for the USB port. This is accessed through the Device Manager on the **Control Panel** included with the Windows operating system.
- Change the COM port assignment in the Datacolor applications software.

### Cable Installation

The USB cable provided with the system is shown below:



One end of the cable connects to a USB port on the instrument. The other connects to a USB port on the computer.

- Connect the USB cable to the instrument and to the USB port on the back of the computer.

## Driver Installation

All current Datacolor software ships with the necessary drivers for the Datacolor Spectro 1000. If you need help, please contact Datacolor Support via our website at:

<http://industrial.datacolor.com/industrial-support/>

## Viewing/Changing System Port Assignment

As part of the USB driver installation, a COM 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.

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 **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.

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## Ethernet Cable Installation

Instruments manufactured by Datacolor can now be connected to an Ethernet port on a desktop system. See *Appendix, Ethernet Connection Considerations*, before you attempt to connect to an Ethernet port.

You can connect the instrument to the computer using **either** an Ethernet cable, **or** a USB cable. Select one of them. This section provides instructions for using the Ethernet cable.

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### NOTE

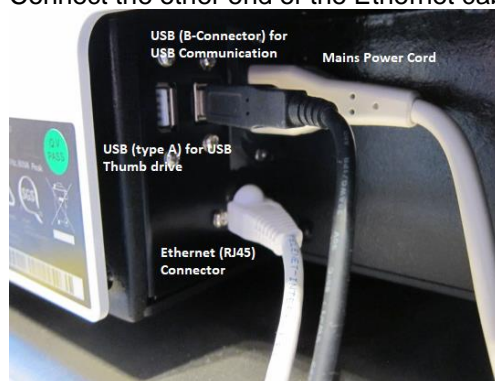
Do not connect all interface cables to the unit at the same time.

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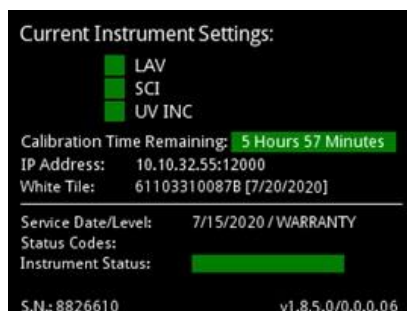
An Ethernet cable is shown below:



1. Connect either end of the Ethernet cable to the connector on the rear panel of the instrument.
2. Connect the other end of the Ethernet cable to an Ethernet LAN port.



3. Observe the LCD Status Display and note the IP address of the instrument. You will need to enter this information into the appropriate software (e.g. TOOLS). Refer to the program User's Guide for information regarding where to enter the IP address.



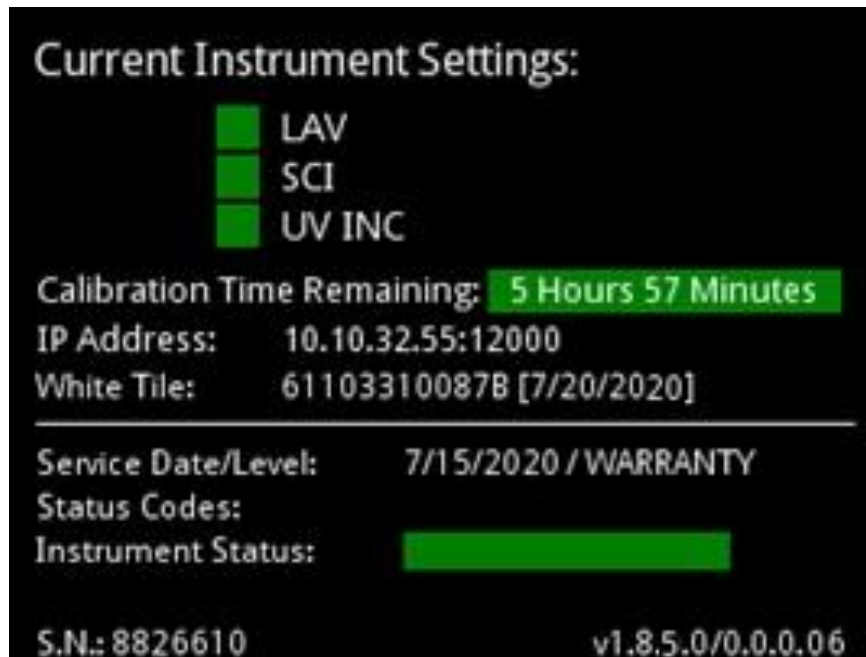
See the *Appendix* for additional *Ethernet Connection Considerations*.

# Controls and Indicators

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## Controls and Indicators Panel

On all benchtop models, an LCD Status Display is located on the instrument. It identifies the current instrument settings being used.



The LCD Status Display will include information regarding:

- Set measurement conditions (aperture, specular port, UV)
- Calibration time remaining
- IP Address (if connected to Ethernet)
- Serial number of the White Tile
- Date and level of last service
- Serial number of the instrument
- Installed firmware version

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## Powering Up

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 **NOTE**

The power cord supplied with the unit *must* be used.

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Use this simple procedure to start using your instrument:

1. Verify all cable connections. The AC power cord should be plugged into an outlet. A communications cable (Ethernet, or USB) should be attached to the instrument and host computer or LAN connection as applicable.
  2. Turn on the computer.
  3. Turn on the instrument power switch. This is located on the side of your instrument.
    - When power is applied, all mechanisms are automatically reset.
    - The LCD will display updates as the instrument starts up, until the final LCD Status Display is shown.
- 

 **NOTE**

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

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4. Depending on the model you are using, the LCD Display may include the status of the following mechanisms:
  - Aperture plate/zoom lens position
  - UV filter status
  - Specular port status

When the **LCD Status Display** is shown, your instrument is ready to use.

5. Launch a Datacolor program on your computer.
6. Prepare to calibrate the instrument. You will need the black trap, the white calibration tile and the green diagnostic tile.

*NOTES*





# Instrument Calibration

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## Overview

The instrument must be calibrated regularly to ensure that the measurements are accurate. This section provides instructions for performing both reflectance and transmittance calibrations.



We recommend that you calibrate the instrument every 8 hours. *Please refer to your software documentation for specific calibration instructions.*

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## Installing Calibration Data

If this is a new instrument, you will not need to install the calibration data. The White Calibration Tile data is preloaded at the factory. However, Datacolor recommends that White Calibration Tiles be replaced annually. If you need to replace your White Calibration Tile, please contact your local Datacolor office. Upon receipt of a new tile, calibration data can be found on the USB Memory Stick included with the tile. Install the data directly on the instrument by inserting a USB Memory Stick containing the WHITESE.DAT and WHITESI.DAT files into the USB port at the rear of the instrument. A menu of options will appear on the instrument's LCD Status Display. Below is an example of the installation procedure.

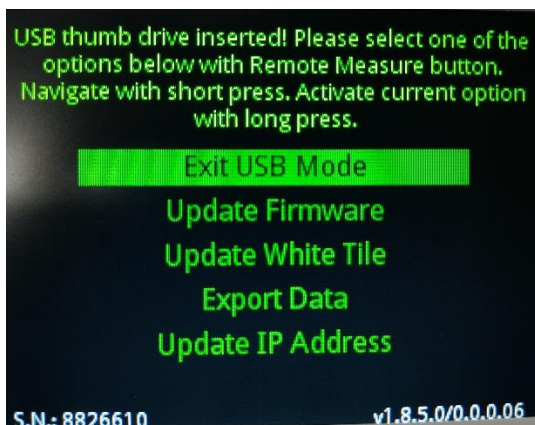


The Remote Measure Button serves multiple purposes. In this scenario, one short click will allow you to cycle through the menu options, while pressing and holding for approximately one second will select a menu option.

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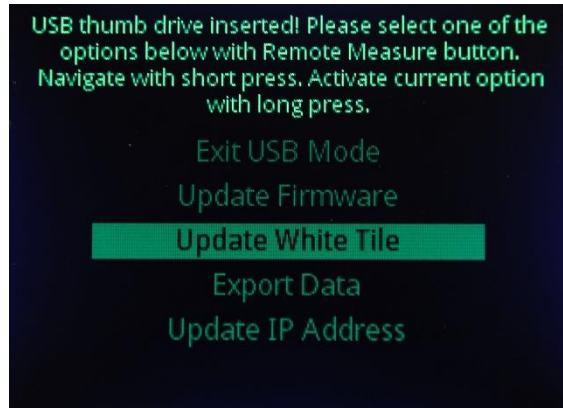
1. Upon inserting the USB Memory Stick into the instrument, while the LCD Status Display is shown, you will see the screen change to one that is similar to the screen below:



Navigation between the menu options is performed with short clicks of the Remote Measure button.

Activating a selected menu option is performed with by pressing and holding the Remote Measure button for approximately one second.  
(Activating the “Exit USB Mode” option will quit the USB mode and returns you to the LCD Status Display.)

2. Updating the White Tile is initiated by selecting (short clicks) and activating (long press) the “Update White Tile” option.



This option will overwrite the older files on the instrument with the new WHITESE.DAT and WHITESI.DAT files on the USB stick, corresponding to the new White Calibration Tile. The instrument will automatically be restarted after the update. The LCD Status Display will reflect the serial number of the new tile.

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## Reflectance 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 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.

### Reflectance Calibration Procedure

The software prompts for calibration vary from one program to another. All of the procedures include two measurements:

- The black trap
- The white tile

Before you begin, verify that the aperture plate at the port matches the aperture selection in the program you are running.

1. Access the calibration procedure in the program you are running.
2. When you are prompted by the program, place the black trap at the instrument port.
3. When you are prompted by the program, place the white tile at the instrument port.
4. The program may prompt you for a diagnostic tile. If prompted, place the green tile at the instrument port, and start the measurement.
5. After these measurements are completed, the program will display a message that the calibration is successful. You can now start measuring samples.

*The Datacolor User's Guide for the program you are running (e.g., Datacolor TOOLS, etc.) provides step-by-step instructions regarding the (instrument) software setup and calibration procedure.*

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#### NOTES

If sequential total *transmittance* and *reflectance* measurements are going to be made using the Datacolor Spectro 1050/750, the instrument should be calibrated *for both transmittance and reflectance conditions*. Transmittance measurements are made using the barium-coated MAV aperture plate.

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## UV Filter Calibration

The procedure for calibrating the adjustable UV filter is performed in reflectance mode and requires the use of a UV calibration standard obtainable from a number of standardization

organizations. Datacolor provides a fluorescent white tile (Fluorescent Reference Standard) that may be used as a reference standard after the instrument has been calibrated for UV using an official UV calibration standard. An applicable whiteness value can only be assigned to the Datacolor Fluorescent Reference Standard after the instrument has been calibrated for UV using an official UV calibration standard. This procedure requires the selection of specific software options. *See also the Datacolor TOOLS User's Guide, which contains step-by-step instructions to calibrate the adjustable UV filter.*

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 **NOTES**

This calibration procedure is critical to the accurate measurement, either reflectance or transmittance, of fluorescent samples.

If you are sharing either reflectance or transmittance data for fluorescent samples, the adjustable UV filter in each of the instruments must be calibrated regularly.

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## Transmittance Calibration

The following accessories are used to calibrate the instrument for transmittance:



Barium-coated MAV Aperture Plate

### White Spectralon® Plaque.

Placed at the sample port for calibration. In addition, it is placed at the port for many transmission measurements. Consult the standard procedure (ASTM, ISO, etc.) you are following to determine if this sample should be placed at the port.

### Black Card. Used to “block”

the lens during calibration (“zero” calibration).

## Calibration Procedure

Before you begin, you should verify the current aperture selection. The setting must be Medium Area View (MAV) and the barium-coated MAV plate (for transmittance measurements only) should be placed at the instrument port.

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### NOTE

Transmittance calibration and measurements **must** be made using the barium-coated Medium Area View (MAV) aperture plate. This special aperture plate is **not** used for reflectance measurements.

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To calibrate the instrument for transmittance measurements, do the following:

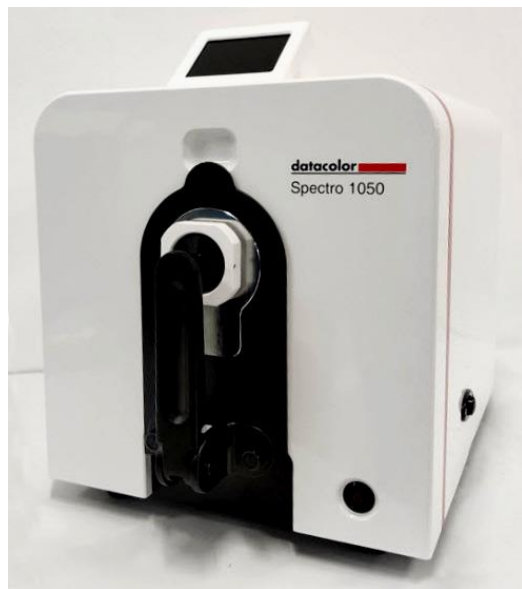
1. Place the barium-coated MAV aperture plate at the port.
2. Open the transmission compartment and make sure the optical path between the sphere and the lens is clear.
3. Access the calibration procedure in the program you are running. You may need to change the selections for the aperture plate, and measurement mode (transmission). *See also the User's Guide for the program you are running for detailed instructions to access the instrument setup and calibration options.*

4. When you are prompted by the program, block the lens using the black card:



5. When the measurement is completed, remove the black card from the transmission compartment.

6. Place the white Spectralon® plaque at the sample port and make the next measurement.



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 **NOTES**

The white Spectralon® plaque remains at the port for “Regular” and “Total” Transmittance measurements and is replaced with the black trap for “Diffuse” Transmittance measurements. See also *Transmittance Measurements*.

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# Sample Presentation and Measurement

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## Sample Presentation and Measurement Overview

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.

### Reflectance Measurements

1. Grasp the sample holder and pull forward.
2. Position the sample, then carefully bring arm back up to normal operating position. If using the Datacolor Spectro 1000X, user may want to leave sample arm up depending on samples being measured.

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#### **WARNING**

**Do not allow sample arm to spring back. Also, the sample arm attaches to the instrument via two captive fasteners that can be hand tightened. Before first use, ensure that the sample arm is firmly attached.**

**For the Datacolor Spectro 1000V and Datacolor Spectro 700V options (vertical mount), the cylindrical, spring-loaded sample holder can be depressed to position your sample. You can return the cylinder to its normal position with a quarter turn of the cylinder.**

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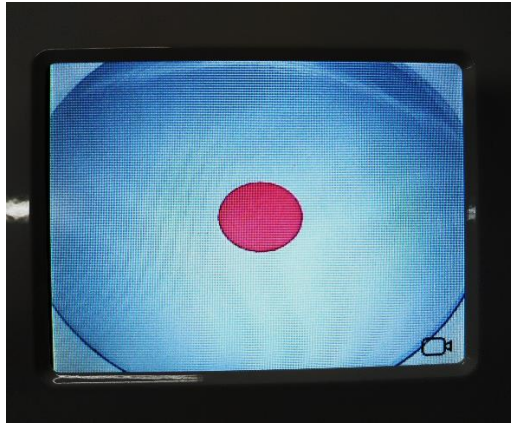
### Sample Viewing Port

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. Place the sample at the port. Grasp the black tab above the aperture plate.
2. Pull top of door down to its full horizontal position.
3. The backside of this door reveals the area of the sample covering the port opening. If necessary, adjust the placement of the sample to target the portion of the sample to be measured.
4. Push the door back to its normal position.

## Sample Viewing Display

When measuring samples on the Datacolor Spectro 1000, 1000V, and 1050, the status display also serves as a display for sample placement. Toggle to the sample camera view on the LCD by pressing and holding the Remote Measure Button for approximately one second.



### **Remote Measure Button**

The button at the top of the instrument is used to start a measurement from the instrument, rather than from the program. Depending upon your instrument model, it can also be used to toggle to and from a display of video from an internal camera used for sample placement. Toggling the display between the LCD Status Display and the camera video can be performed by pressing and holding the button down for approximately one second.

## Sample Temperature

Datacolor Spectro models reports the temperature of the sample at the time of the color measurement. The temperature sensor reports in the following measurement conditions:

1. LAV aperture only
2. Specular Included, Specular Excluded
3. UV – 100%, 0% UV, UV Calibrated, FL42, FL46, UV D65/10 (Ganz-Griesser), UV D65/10 (CIE Whiteness), UVC (ISO Brightness), Calibrator

The sample temperature is captured during the sample measurement and reported in Datacolor TOOLS. Datacolor TOOLS is set to a default temperature range of 15-32 degree Celsius (59F to 89.6F). Temperature minimum and maximum limits supported by the sensor are -40 C (Min) and 85 C (Max).

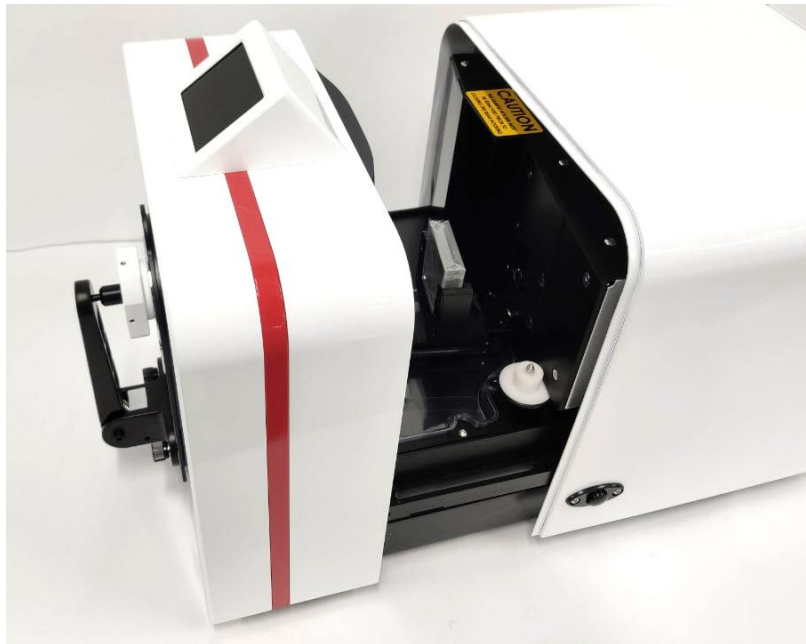


## Transmittance Measurements

Three techniques are used to measure the transmittance of samples: “regular” transmittance, “total” transmittance and “diffuse” transmittance.

### *Regular Transmittance*

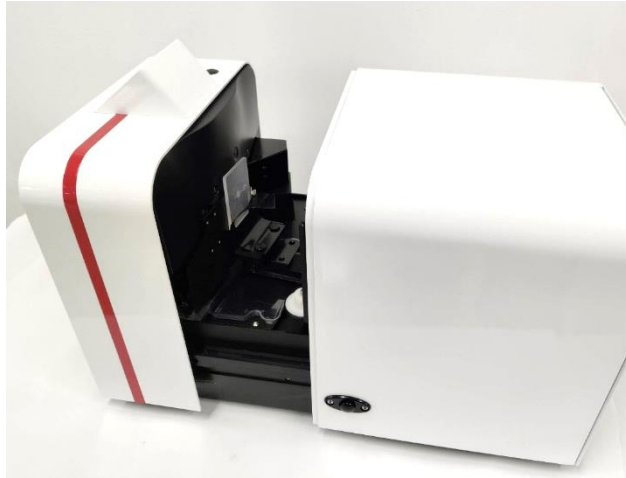
When working with samples that are completely transparent (such as dyes in solution or transparent plastics) you are measuring “regular” transmittance. These samples need to be positioned close to the lens opening at the back of the transmission compartment using either the cuvette holder or solid sample holder as appropriate:



**Regular Transmittance**

## **Total, Diffuse, and Haze Transmittance**

When measuring the transmittance of translucent samples that contain particles, such as engineered resins or opal glass, you are measuring either “total” or “diffuse” transmittance. The samples should be positioned at the front of the transmission compartment, close to the sphere opening.



“Total” transmittance measurements are made with the white Spectralon® plaque in place at the front aperture plate and the sample placed against the sphere opening.

“Diffuse” transmittance measurements are made with the black trap in place at the front aperture plate and the sample placed against the sphere opening.

Haze assessments are made using two measurements, one with the white Spectralon® plaque, the other with the black trap installed at the front aperture plate. For both measurements, the sample must be placed against the sphere opening.

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### **NOTES**

Use the solid sample holder to place the solid sample flush against the sphere opening. In order to ensure the best measurement, there must be no gap between the sample and the sphere opening in “Total”, “Diffuse”, or Haze measurements.

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**Total Transmittance**



**Diffuse Transmittance**

*Consult with your Applications Specialist regarding the measurement technique you should use for specific evaluations.*

*NOTES*

# Maintenance

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## About Instrument Maintenance

The certificate of performance supplied with this instrument is valid for one (1) year under the following conditions:

- It is used in an environment suitable for the instrument type.
- It is handled and used with care.

Datacolor strongly recommends that the instrument be serviced once/year by an authorized service engineer.

Datacolor offers a variety of maintenance and certification services to match your needs. Please contact your local Datacolor office for more information.

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

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### CAUTION

There are no user-serviceable parts for this equipment.

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## Exterior Surface Cleaning

The white, exterior surface of the instrument can be cleaned with an isopropyl alcohol wipe. For more persistent stains, acetone can also be applied.

Warning: Some acetone-based chemicals can cause logo deteriorations with usage.

## Sphere Cleaning

The measurement port should be examined visually for the presence of dust, sample particles, fibers, and excessive yellowing due to environmental influences. *This inspection should be performed frequently, especially if you measure loose materials.*

Loose materials in the sphere should be removed by a Datacolor-certified technician.

## **Tile Handling and Cleaning**

### ***Handling Tiles***

- Handle calibration tiles with extreme care. Do not drop them or scratch the glazed surface.
- Always use the edges to grasp the tile.

### ***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 use 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 surface.
- **NEVER** immerse the tiles in water.
- Tiles that have scratches, chips, abrasions or cracks must be replaced. Signs of wear and tear on the tile surface will affect the accuracy of the calibration.

### ***Tile Storage***

- Large temperature variations will affect the accuracy of the 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.



## Cleaning the Spectralon® Plaque

This is the white plaque used for transmission calibration and measurement. It is an optical standard and should be handled in the same way as other optical standards. All efforts should be made to prevent contaminants from contacting the surface of the plaque. We recommend that you wear gloves when handling this plaque.

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### **WARNING**

Do NOT use Freon to air brush this plaque.

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### **Cleaning Instructions**

If the tile is lightly soiled, it may be air brushed with a jet of clean dry air or nitrogen. For heavier soil, the material can be cleaned using the following procedure:

1. Sand the surface under running water with a 220 – 240 grit waterproof emery cloth, until the surface is totally hydrophobic (water beads and runs off immediately).
2. Blow dry with clean air or nitrogen, or allow the material to air dry.

## Handling and Cleaning the Cuvette

This is used for the measurement (Transmittance) of liquid samples. All efforts should be made to prevent scratches and contaminants from contacting the surface of the cuvette. We recommend that you wear gloves when handling the cuvette and grasp it from the opaque sides only.

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 **WARNING**

Handle with care by grasping the opaque sides only. Do not scratch the surface with abrasive cleaning materials. Only use materials appropriate for the cleaning of **optical glass**.

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The cuvette is made of **optical glass**. It is recommended that standard methods applicable to the cleaning of optical glass cuvettes be used as required between the measurements of different samples.



## Instrument Status

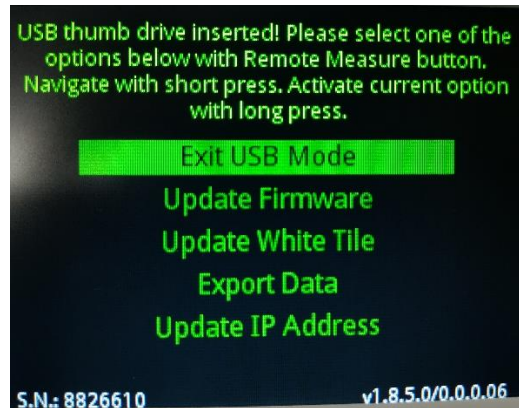
The LCD Status Display includes a color coded (green, yellow, red) Instrument Status bar. Normally, this bar will be green in color and the Status Codes field will be blank. Certain conditions, including the ones listed below, may cause the Instrument Status bar to be yellow or red in color. Corresponding Status Codes will also be displayed. Should these conditions occur, please contact your local Datacolor office for more information and guidance regarding next steps.

Item	Condition	Code and Color
Age of White Tile (Replacement recommended yearly)	10-12 months old	00111; Yellow
	> 12 months old	00121; Red
Control Measurements (Taken during Calibration)	$dE > 0.5$ for a given set of measurement conditions.	00212; Red
	$0.5 \geq dE \geq 0.35$ for a given set of measurement conditions.	00211; Yellow
Time since last Maintenance and Certification	>12 months	00311; Yellow

## Exporting Diagnostic Data

Diagnostic data is stored on the instrument. Your local Datacolor office may ask for this data in order to remotely service your instrument. This data can be retrieved via a USB Memory Stick.

1. Upon inserting a USB Memory Stick into the instrument, you will see a screen similar to the one below:



The above option menu is displayed only when inserting the USB stick while on the LCD Status Display.

Navigation between the menu options is performed with short clicks of the Remote Measure button.

Activating the currently selected menu option is performed with by pressing and holding the Remote Measure button for approximately one second.

(Activating the "Exit USB Mode" option will quit the USB mode and displays the LCD Status Display.

2. Exporting diagnostic data is initiated by selecting (short clicks) and activating (long press) the "Export Data" option



3. When the export is complete, the following will be indicated:



4. The data will be stored in a folder named with the following pattern: "Backup"-<InstrumentModel>-<InstrumentSerialNumber>-<CurrentDateTime>

## Updating Firmware

The instrument's firmware can also be updated via a USB Memory Stick. Please contact your local Datacolor office before attempting to update the instrument's firmware.

## Static IP Address

The instrument's IP address is assigned via DHCP by default when the instrument is connected to a Local Area Network (LAN) via Ethernet. However, a static (fixed) IP address can be configured. Please contact your local Datacolor office before attempting to set a static IP address.

*NOTES*

# Appendix

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## Datacolor Spectro 1000 Instrument Specifications

*Specifications are subject to change without notice.*

ITEM	DESCRIPTION
<b>Instrument Type</b>	Dual beam integrating sphere with xenon flash lamp.
<b>Measuring Geometry</b>	Diffuse illumination, 8° viewing in conformance with CIE publication No. 15.2 Colorimetry.
<b>Illumination Source</b>	Pulsed xenon, filtered to approximate D65.
<b>Sphere Diameter</b>	152 mm / 6.0 inches
<b>Specular Port</b>	Automated specular included or specular excluded
<b>Spectral Analyzer</b>	SPX analyzer with dual 256-diode array and high-resolution holographic grating.
<b>Wavelength Range</b>	360 – 700nm
<b>Photometric Range</b>	0 to 200%
<b>Black Trap</b>	High performance
<b>Aperture Configuration</b>	Large Area View. 30mm illuminated/ 26mm viewed Medium Area View. 20mm illuminated/ 16mm viewed Small Area View. 9mm illuminated/ 5mm viewed Ultra-Small Area View. 6.5mm illuminated/ 2.5mm viewed
<b>Input Power Requirements</b>	Input Voltage: 100-240VAC Voltage fluctuations: +/- 10% Number of Phases: Single Frequency: 50/60 Hz Power Rating: 80VA
<b>Operating Environment</b>	<b>Temperature:</b> 5°C to 40°C <b>Recommended Temperature:</b> 23°C +/- 2°C <b>Maximum Relative Humidity:</b> 20%-85% non-condensing <b>Recommended Relative Humidity:</b> 50% +/-15% non-condensing <b>Altitude:</b> Up to 2,000 meters Do not store above 140°F (60°C) Indoor Use (IPXO), Pollution Degree 2 Do not crush, short circuit, mutilate, reverse polarity, disassemble, or dispose. In fire, might cause burns or release toxic materials.
<b>Interface</b>	USB: 2.0 Ethernet
<b>LCD</b>	3.5" RGB Color Display Module  Max Resolution            320 x 240  Maximum Pixel Clock    28 MHz

Power Consumption 150mA @ 3.3 V

Operating Temp. -20°C to +70°C

Dimensions 82 x 77 x 11.55 mm

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**Instrument  
Dimensions\***

**Horizontal:**

Size: L 16.4" (41.66 cm) front to back  
L18.3" (46.48 cm) sample arm to back  
H 15.3" x W 12.3" (38.86 cm x 31.24cm)

**Vertical:**

Height: 25.0" (63.5 cm)  
Width: 12.2" (39.9 cm)  
Depth: 16.3" (41.4 cm)

**Aperture Upward Facing:**

Height: 18.7" (47.6 cm)  
Width: 12.2" (39.9 cm)  
Depth: 16.3" (41.4 cm)

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**Horizontal:**

Weight: 44.0 lbs (20.0 kg)

**Vertical:**

Weight: 54.5 lbs (24.7 kg)

**Aperture Upward Facing:**

Weight: 50-52 lbs

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**Instrument  
Dimensions\***

**Horizontal:**

Size: L 16.4" (41.66 cm) front to back  
L18.3" (46.48 cm) sample arm to back  
H 15.3" x W 12.3" (38.86 cm x 31.24cm)

**Vertical:**

Height: 25.0" (63.5 cm)  
Width: 12.2" (39.9 cm)  
Depth: 16.3" (41.4 cm)

**Aperture Upward Facing:**

Height: 18.7" (47.6 cm)  
Width: 12.2" (39.9 cm)  
Depth: 16.3" (41.4 cm)

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**Horizontal:**

Weight: 44.0 lbs (20.0 kg)

**Vertical:**

Weight: 54.5 lbs (24.7 kg)

**Aperture Upward Facing:**

Weight: 50-52 lbs

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\* Sample translucency may affect inter-lens agreement

\*\* Dimensions shown are for horizontal mount instruments.

## Features of the Datacolor Spectro 1000 and Related Configurations

FEATURE	Datacolor Spectro 1000	Datacolor Spectro 1000V	Datacolor Spectro 1050	Datacolor Spectro 1000X
Reporting Interval	10nm	10nm	10nm	10nm
Effective Bandwidth	10nm	10nm	10nm	10n
20 Read Repeatability on White Tile Using Two Flashes (CIELAB)	0.01 dE (max)	0.01 dE (max)	0.01 dE (max)	0.01 dE (max)
Inter-instrument Agreement—Reflectance Measurements* (CIEL*a*b*)	0.15 (max)* 0.08 (avg)*	0.15 (max)* 0.08 (avg)*	0.15 (max)* 0.08 (avg)*	0.15 (max)* 0.08 (avg)*
Lens	4 position auto-zoom	4 position auto-zoom	4 position auto-zoom	4 position auto-zoom
Aperture Plates	3 standard LAV SAV USAV	3 standard LAV SAV USAV	3 standard LAV SAV USAV	3 standard LAV SAV USAV
	2 optional MAV XUSAV	2 optional MAV XUSAV	2 optional MAV XUSAV	2 optional MAV XUSAV
Aperture Detection	Yes	Yes	Yes	Yes
Automated, adjustable UV Calibration	Yes	Yes	Yes	Yes
UV Cutoff Filters	400 nm	400 nm	400 nm	400 nm
	420 nm	420 nm	420 nm	420 nm
	460nm	460nm	460nm	460nm
Remote Measurement Button	Yes	Yes	Yes	Yes
Camera	Yes	Yes	Yes	Yes
Vertical Mount	No	Yes	No	Yes
Transmittance	No	No	Yes	No
Inter-instrument agreement – regular transmittance at 750 nm	—	—	±0.20% at 85% T ±0.10% at 32% T	—
Inter-instrument agreement – transmission haze measurements	—	—	±0.15% at 10% TH	—

<b>Transmission aperture size</b>	—	—	22 mm	—
<b>Sample Temperature:</b>	LAV aperture	LAV aperture	LAV aperture	LAV aperture

## Features of the Datacolor Spectro 700 and Related Configurations

FEATURE	Datacolor Spectro 700	Datacolor Spectro 700UV	Datacolor Spectro 750	Datacolor Spectro 700V	Datacolor Spectro 700V UV
<b>Reporting Interval</b>	10nm	10nm	10nm	10nm	10nm
<b>Effective Bandwidth</b>	10nm	10nm	10nm	10nm	10nm
<b>20 Read Repeatability on White Tile Using Two Flashes (CIELAB)</b>	0.03 dE (max)	0.03 dE (max)	0.03 dE (max)	0.03 dE (max)	0.03 dE (max)
<b>Inter-instrument Agreement—Reflectance Measurements* (CIEL*a*b*)</b>	0.30 (max)* 0.15 (avg)*	0.30 (max)* 0.15 (avg)*	0.30 (max)* 0.15 (avg)*	0.30 (max)* 0.15 (avg)*	0.30 (max)* 0.15 (avg)*
<b>Lens</b>	4 position auto-zoom	4 position auto-zoom	4 position auto-zoom	4 position auto-zoom	4 position auto-zoom
<b>Aperture Plates</b>	3 standard LAV SAV USAV	3 standard LAV SAV USAV	3 standard LAV SAV USAV	3 standard LAV SAV USAV	3 standard LAV SAV USAV
	2 optional MAV XUSAV	2 optional MAV XUSAV	2 optional MAV XUSAV	2 optional MAV XUSAV	2 optional MAV XUSAV
<b>Aperture Detection</b>	Yes	Yes	Yes	Yes	Yes
<b>Automated, adjustable UV Calibration</b>	No	Yes	Yes	No	Yes
<b>UV Cutoff Filters</b>	NA	400 nm 420 nm 460nm	400 nm 420 nm 460nm	NA	400 nm 420 nm 460nm
<b>Remote Measurement Button</b>	Yes	Yes	Yes	Yes	Yes
<b>Camera</b>	No	No	No	No	No
<b>Vertical Mount</b>	No	No	No	Yes	Yes
<b>Transmittance</b>	No	No	Yes	No	No
<b>Inter-instrument agreement – regular transmittance at 750 nm</b>	—	—	±0.40% at 85% T ±0.20% at 32% T	—	—



<b>Inter-instrument agreement – transmission haze measurements</b>	—	—	±0.30% at 10% TH	—	—
<b>Transmission aperture size</b>	—	—	22 mm	—	—
<b>Sample Temperature:</b>	LAV aperture	LAV aperture	LAV aperture	LAV aperture	LAV aperture

\* Measurements made at 23° C +/- 1° C.

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## Miscellaneous Technical Information

### System Requirements for USB Connection

Below are the software and firmware versions required to successfully connect a Datacolor instrument to a USB port.

<b>Operating Systems</b>	Windows 7 or higher
<b>USB Firmware</b>	2.0 or higher

### Ethernet Connection Considerations

The instrument connects to an Ethernet port via a standard Cat 5 cable. Because the distance from the instrument to the closest available LAN connection point varies per installation, a cable is not provided. Both the instrument and the associated computer must be on the same Local Area Network (LAN) and configured to be on the same Subnet (e.g. 255.255.255.0). This is not a point-to-point connection between the instrument and the computer.

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 **NOTES**

The Instrument relies upon a DHCP Server to obtain an IP address and does not have a Host Name.

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## Datacolor Global Support

A complete User's Guide is provided with this product. However there are also resources regarding color education on the Datacolor website, including contact information for local Datacolor offices.

<http://industrial.datacolor.com/support/contact-us-2/>