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**Datacolor**

Datacolor 110R

User's Guide



**Datacolor 110R User Guide** (September, 2008)

User's Guide Part No. 4230-0400M

Patent Information

Name of originator: Applied Color Systems, Inc.

Date: March 26, 2002

Title of patent document. Portable Color Measuring Device

Patent number: U.S. Patent No. 6,362,886

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# Introduction

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## About the Datacolor 110R™

Datacolor 110R, a portable spectrophotometer, is among the newest generation of color measuring instruments produced by Datacolor.



It incorporates state-of-the-art CMOS integrated circuit technology in the instrument design, and uses a PDA, customized with color measurement software, as its interface. The Datacolor 110R is a stand-alone instrument used to measure colored samples and store data.

## ***Datacolor 110R and Datacolor Products***

The Datacolor 110R can also be connected or “tethered” to a desktop PC to be used as the primary measuring instrument for all Datacolor programs. In addition, data collected by the Datacolor 110R in “stand alone” mode can be transferred to the desktop PC. The Datacolor Portables Desktop program and Palm® Desktop program are required to perform this data transfer.

### ***Datacolor Portables Desktop Program***

The Datacolor Portables Desktop program is installed onto a desktop computer, and is used to transfer data between the Datacolor 110R and the desktop PC. It runs silently during the data exchange between the 110R and Datacolor PAINT or Paintmaker. In the event that the white calibration data becomes corrupted or the file is replaced, this program is used to re-install white tile data to the stand-alone software on the Datacolor 110R. See *Datacolor Portables Desktop Program* in this guide for details on the data exchange between the Datacolor 110R and Paintmaker/Datacolor PAINT.

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## **Software Identification**

The version numbers for the software and firmware on your unit are requested whenever you contact the manufacturer regarding technical support. The software and firmware version numbers are found on the PDA.

To access this information, do the following:

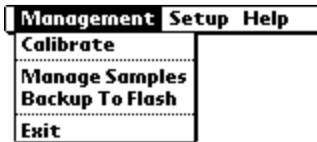
1. If you are not in the Datacolor 110R software, tap the **Datacolor** icon on the PDA desktop.



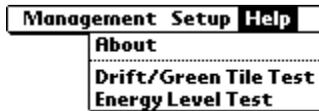
2. Tap Datacolor in the title bar at the top of the screen:



Three options display at the top: **Management**, **Setup**, and **Help**.



3. Tap **Help**. A drop-down menu displays.



4. Tap **About**. A screen displays with details regarding the current instrument configuration, and the software and firmware versions contained on the unit.



**NOTE**

If no information regarding the instrument appears on the *About* screen, this indicates that the instrument is not calibrated. When calibrated, all details about the instrument are displayed.

*NOTES*

# Instrument

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## General Information

### *Power Source*

The only power sources that should be used with the unit are the power adapter or lithium ion batteries, both available only from Datacolor.

Power adapter (Datacolor part no. 4050-0065) has a maximum output of 6.5 volts DC, 1.5 amps.

The power cord supplied ***must*** be used.

Replaceable lithium ion batteries (Datacolor part. no. 1200-1299) are the only batteries compatible with Datacolor 110R. **Do not use any other rechargeable or non-rechargeable batteries.**

### *Operation*

This product is to be used only in a manner specified by the manufacturer, and according to the instructions for operation and maintenance provided herein.

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

### *Replacement Parts*

This instrument uses high voltage during operation, and should only be serviced by qualified personnel.

### *Labels*

There are several labels on the unit including the following:

- The  **WARNING** symbol indicates that the user should refer to the manual before using the instrument.
- Datacolor 110R instrument model and serial number.

---

## Safety Warnings

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

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

---

### CAUTIONS

- (1) Disconnect all power before servicing.
  - (2) The power cord supplied *must* be used.
  - (3) There are no user serviceable parts for this system.
- 

---

## Power Sources

The Datacolor 110R can be powered from an internal battery, or plugged into an external power adapter. Whenever the Datacolor 110R is not connected to the power adapter, it is running from the battery. The battery is fully charged before it leaves the factory. However, it may lose some of its charge by the time it arrives at your location. **We strongly suggest that you connect Datacolor 110R to the power adapter as soon as you receive the unit.** Refer to section entitled, "Instrument Cable" for instructions on how to attach the power adapter to the unit.

### ***Running from Power Adapter***

When the Datacolor 110R is connected to the power adapter, it automatically recharges the battery at the same time it is providing power to the unit. You can use the Datacolor 110R to make measurements while the battery is recharging. When the battery is totally discharged, it takes approximately 4 hours to fully recharge it.

### **NOTES**

When you connect the Datacolor 110R to the external power adapter, the instrument will not recharge if the instrument is asleep (the LED indicator on the front is not lighted). Press the **Measure** button on the back of the unit to activate the instrument.

Once activated, the instrument will never enter *Sleep* mode while it is connected to the external adapter. The PDA will time out, but the instrument will remain active (the LED indicator on the front of the unit will be lighted).

## Running from the Internal Battery

When the battery icon contains a single bar, the battery level is low, and a text message (below) displays. This is your prompt to charge the battery.



This message will be displayed at 5-minute intervals. The first time it is displayed, you have battery power remaining for approximately 250 measurements.

If you continue to make measurements without charging the battery, and the remaining power drops to a critical level, a second "low battery warning" (below) displays, and the battery icon will not contain any bars.



This message displays at 2-minute intervals. This first time it is displayed you have battery power remaining for approximately 30 measurements.

**BACK UP your data NOW if you have not already done so. If you do not, you will not have enough power to complete the backup process.**

When the LED indicator on the front of the unit *repeatedly* cycles through the green/red/amber color sequences the unit is ready to shut down. When this happens, you DO NOT have enough power to complete a backup. You should immediately connect the unit to the external power adapter.

If the battery has completely discharged, the unit must be connected to the power adapter for approximately one hour before the LCD becomes active.

### **WARNINGS**

When the battery is totally discharged, **everything on the PDA interface is lost!!!** It is important for you to back up your data regularly to the flash memory card so that you do not lose any important information.

If the LED indicator remains amber or red for an extended period of time, the instrument needs to be reset. To reset, press the **Measure** button on the back of the unit until the light goes out. You can then resume using the instrument.

## ***Sleep and Active Mode***

When the unit is being powered from the internal battery, both the instrument and the PDA are running from the same battery. To conserve the battery power, both the instrument and the PDA are programmed to timeout, or go into *Sleep* mode when no activity is detected over a specified time period.

The *Sleep* function is controlled separately for each component. As a result, the instrument can remain active (“awake”) while the PDA is asleep, and the PDA can remain active (“awake”) while the instrument is asleep.

### **Sleep Mode—Instrument**

The LED on the front of the instrument indicates the status of the instrument. When the LED is lighted, the instrument is active. When it is not lighted, the instrument is *asleep*. When no measurements are made within a 20-second interval, the instrument enters *Sleep* mode. When the instrument is in *Sleep* mode, you must press the **Measure** button (on the back of the unit) to activate it and complete a measurement.

#### **NOTES**

If the Datacolor 110R software on the PDA is not open, you must press the **Measure** button twice. This opens the Datacolor 110R software on the PDA, and then completes the measurement.

With respect to the instrument, *Sleep* mode is only enabled when the instrument is running from the internal battery. When the instrument is connected to the external power adapter and not used, it will not re-enter *Sleep* mode unless it is disconnected from the adapter.

### **Sleep Mode—PDA**

When the PDA fails to receive any input (tapping the screen or pressing the buttons on the Control Panel) for the length of the interval, the PDA will go into *Sleep* mode, and the screen will go blank. Unlike the instrument, the PDA will go into *Sleep* mode regardless of the power source (internal battery or power adapter) you are using.

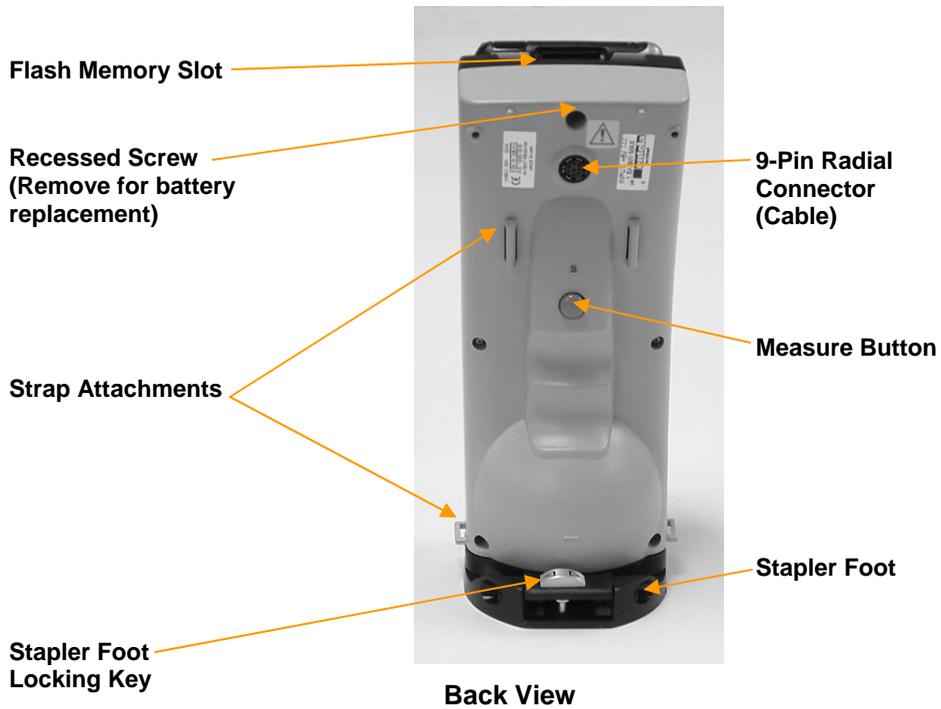
To activate the PDA without activating the instrument, press any of the buttons on the Control Panel. The timeout interval for the PDA is controlled through the Datacolor 110R software (*Management Options, Setup Menu, Preferences*). You can continue working with the data management options while the instrument is in *Sleep* mode.

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## Instrument Controls and Indicators



Front View



### ***Measure Button***

When you press the **RED Measure** button on the back of the unit, the instrument automatically makes a measurement without prompting you for any information.

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## Aperture Sizes

All units are fitted with an aperture plate covering the instrument port.



**LAV Aperture Identification on instrument port**  
It will be LAV (Large Area View) on all units, including units fitted with USAV stapler feet.

**Sphere Opening**

**Bottom of Unit**

Regardless of the aperture size on the unit (L, U), the port opening is always fitted with an LAV (Large Area View) plate. Refer to the table below to review the switch, aperture plate and stapler foot assembly required to obtain accurate measurements for each aperture option.

There are two possible aperture sizes available on Datacolor 110R:

Aperture Selection	Aperture Plate at Port	Stapler Foot Assembly ID
Large Area View	LAV	LAV
Ultra-Small Area View	LAV	USAV

A stapler foot assembly is provided with the unit. This accessory is used to correctly position the sample for measurement. The aperture size is clearly identified on the stapler foot. The stapler foot assembly attached to the unit should always match the aperture setting you are using.



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## Stapler Foot Installation

Included with the instrument is a stapler foot assembly. This is attached to the bottom of the unit to correctly position the sample for measurement.



### WARNING

Exercise caution when installing the stapler foot.

Below are pictures of the stapler foot assembly and the bottom of the unit where it is installed:

#### Bottom of Unit



**LAV Aperture Identification** on instrument port

**Sphere Opening**

#### Stapler Foot Assembly



**Locking Key**

Slides left/right to lock/unlock jaw of stapler foot.

**Red Dot (not shown)**

Used to align foot with instrument during installation.



**Stapler Foot Aperture Identification**

## ***Installing the Stapler Foot***

1. Slide the locking key on the stapler foot to the right to close it.
2. Orient the stapler foot assembly so that the front of the stapler foot assembly is parallel to the front of the unit.
3. On the front of the stapler foot there is a red dot. On the front of the instrument there are two dots. One is red and one is gray. Align the red dot on the stapler foot with the gray dot on the instrument.



4. Twist the stapler foot clockwise to lock it into position. When it is properly installed, the red dot on the stapler foot will line up with the red dot on the instrument.
5. To remove the stapler foot from the unit, twist the stapler foot counterclockwise.



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## Accessories

The Datacolor 110R is packaged in a soft-sided carrying case that contains all of the accessories required to use the instrument. Standard accessories include the following:



**Spare stylus/reset tool**

**Stapler Foot Assembly**  
*See Stapler Foot Installation for installation instructions.*



**Hex Driver**

### Power Adapter / Power Cord



### Communications Cable

#### (Serial Cable)



#### (USB Cable)



In addition, you will find a Datacolor 110R User Guide, and four CDs:

- **Palm® CD.** Contains the Palm® Desktop software. You must load this to transfer data between the Datacolor 110R and the Desktop PC.
- **Datacolor Portables Desktop CD.** This contains the Datacolor Portables Desktop software. You must load this to transfer data between the Datacolor 110R™ and the Desktop PC. It also contains electronic copies of the Datacolor 110R User's Guide.
- **Instrument Driver CD.** This software allows the instrument to be used as a color measuring device for a Datacolor SPECTRUM software program.

#### **NOTE**

If you are running Datacolor PAINT, you do not need this software.

- **USB Drivers and Documentation CD.** If you will be connecting the Datacolor 110R to a USB port, you will need to install additional software. This disk contains the software to be added to enable the USB port, and an electronic copy of the installation instructions.

## ***Calibration Tiles—Care and Handling***

### **Handling**

- Handle the tile by its edges, not by the face. Oils and dirt from the skin can affect the measurement.
- The temperature of the tile surface must be comparable to the temperature of the samples being measured. The tiles should be given time to acclimate before the calibration is performed.
- Place the tile gently against the instrument port. Do not slide or rotate it while in contact with the aperture plate to avoid abrasion of the surface.
- The orientation of the tile against the port should be consistent. Use the serial number on the back of the tile as a means of orientation. The tile should be presented with the label in the upright position, and centered over the port opening.

### **Cleaning**

- The calibration tiles should be cleaned before each use. Wiping it clean with a soft, lint-free cloth can do this.
- 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.

### **Care**

- Do not allow the tiles to be immersed in any fluid. This can cause blotching or color changes.
- 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.

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## Instrument Cable

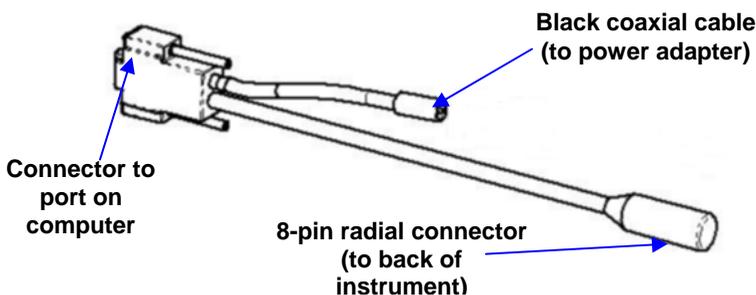
A custom cable is included with the instrument. This cable comes as 3 separate components (shown below) that you must assemble.

### NOTE

You can connect Datacolor 110R to either a serial port or a USB port on a desktop computer.

## Cable Components

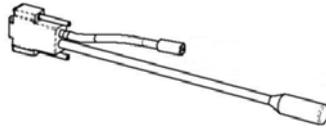
When assembled, the Datacolor 110R cable has 3 connectors on it. One connects to the instrument, one connects to a port on the computer, and one connects to the power adapter.



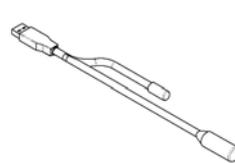
### NOTE

Two communications cables are supplied with the instrument. One is used to connect the unit to a serial port, and the other is used to connect to a USB port. You will only use one of these cables, based on the type of communications port available on your computer.

**Serial  
Communications Cable**



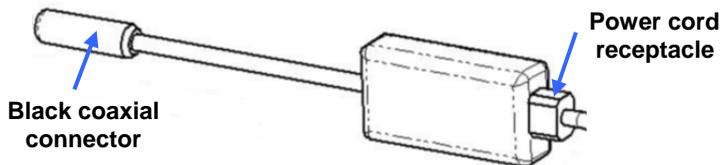
**USB  
Communications Cable**



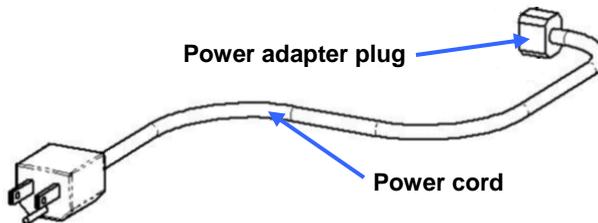
**NOTE**

If you are not connecting Datacolor 110R to a computer for use with other Datacolor software products, it does not matter which communications cable you use. Either can be used for the purpose of connecting to the power adapter.

- **POWER ADAPTER.** This component includes a black coaxial connector, and a power adapter with power cord receptacle.



- **POWER ADAPTER CORD** that includes a plug to power outlet and a plug to power adapter.



**CAUTION**

The power cord supplied with the unit must be used.

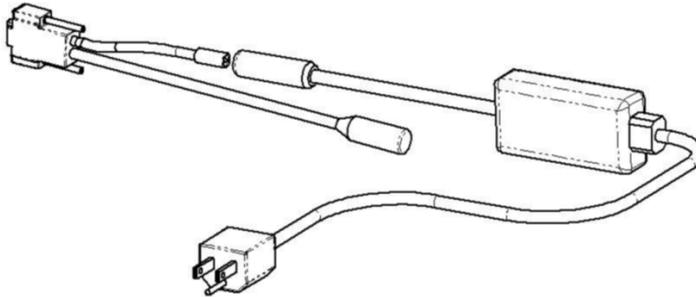
## Cable Assembly

### WARNING

Disconnect the power adapter from the wall outlet before connecting Datacolor 110R to the adapter or PC.

1. Plug the black coaxial connector from the Datacolor 110R connector (1) into the black coaxial connector from the power adapter (1).
2. Insert the adapter power cord into the adapter (2).
3. Plug the radial connector (3) into the port on the back of the Datacolor 110R.

When assembled correctly, your cable should look like the diagram below:

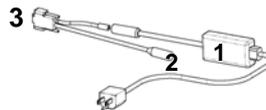


It is used for two functions:

- To connect the Datacolor 110R to its power adapter. When connected to the adapter, the battery in the Datacolor 110R is being recharged, while the unit is also available for measurements.
- To connect Datacolor 110R to a port on a PC.

## Cable Connections

DC adapter (1)  
Connector to instrument (2)  
Connector to port on PC (3)



The 8-pin radial connector (2) plugs into the port on the back of the instrument. The USB/Serial connector (3) connects to a port on a computer (3).

## Serial Port Cable Ends

The serial D connector is used to connect to the serial port on a computer.



*LEFT:* 8-pin Serial D Connector  
(to serial port on back of unit)

*RIGHT:* 8-pin Radial Connector  
(to back of unit)



Back view of Datacolor 110R

## USB Port Cable Ends

The USB connector is used with a USB port on the back of the computer.



*LEFT:* USB Connector  
(to USB port on back of unit)

*RIGHT:* 8-pin Radial Connector  
(to back of Datacolor 110R)



Back view of  
Datacolor 110R

### NOTES

To use Datacolor 110R with a USB port, you must install software onto the system. For instructions to install the USB drivers, see *Configuring Datacolor 110R for a USB Port in the Appendix of this guide.*

## Connecting the Instrument to the Power Adapter

The cable must be completely assembled in order to run Datacolor 110R from the power adapter.

1. Insert the 8-pin radial connector into the port on the back of the instrument. This is a keyed connector and must be precisely oriented, so that the pins in connector are correctly aligned to fit the pin pattern of the serial port. Looking at the rear of the instrument, the cable should be oriented so that the flat edge of the connector shield is facing to the right.
2. Plug the power cord into an outlet.

## Connecting the Instrument to a Desktop PC

The Datacolor 110R can be connected to a desktop PC for use as the primary measuring instrument for Paintmaker/Datacolor PAINT, or another Datacolor program. For this function, you must connect the instrument to either a serial or USB port.

### Serial Port Connection

1. Insert the radial connector into the port on the back of the Datacolor 110R. This connector is a keyed connector and must be precisely oriented, so that the pins in connector are correctly aligned to fit the pin pattern of the serial port on the instrument. Looking at the rear of the instrument, the cable should be oriented so that the flat edge of the connector shield is facing to the right.
2. Insert the serial D connector into the serial port on the back of the computer. You should carefully note the identification of the serial port you are using (i.e., Com 1, Com 2, etc.).

### USB Port Connection

To connect Datacolor 110R to the USB port, do the following:

1. Insert the radial connector into the port on the back of the instrument.
2. Insert the USB connector into the USB port on the back of the computer.
3. You must also install software to allow communication between the Datacolor 110R and the USB port. *See Appendix, Datacolor 110R Configuration for a USB Port for software installation instructions.*

Using Datacolor 110R as the measuring device for a Datacolor SPECTRUM program may require changes to the instrument setup. *See the user's guide for the product for instructions regarding the instrument setup.*

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## Battery Removal/Replacement

### NOTE

You do not have to remove the battery to recharge it. The battery can be recharged by connecting the unit to the power adapter. See *Instrument, Power Sources* for an explanation of this feature.

1. Wait for the PDA to go into *Sleep* mode.
2. Using the hex driver (screwdriver with yellow handle in instrument bag), remove the recessed screw on the back of the unit. This screw secures the bezel housing the PDA (black) to the instrument cover (gray).



3. Disconnect the ribbon cable from the PDA.



4. On the right side of the battery, there is a black switch. Press this switch down to release the battery.



5. Remove the battery completely from the housing.



6. Seat the new battery into the housing.
7. Reattach the ribbon cable to the PDA.
8. Check to be sure there is power to the PDA, and the unit is functioning before you re-secure the cover.

---

## Instrument Maintenance

There are no user-serviceable parts for this equipment.

*NOTES*

# System Navigation

---

## Interface Features

Below is the Datacolor 110R user interface. It is composed of three sections:



Datacolor 110R utilizes most of the navigation tools that are standard with a PDA, but some of these functions have been customized to accommodate features specific to Datacolor 110R.

## Display Screen

Below is the main display screen for Datacolor 110R:



### WARNING

Use the stylus provided with the unit or your finger to make screen selections. **DO NOT APPLY ANY TYPE OF SHARP OBJECT TO THE SCREEN.** Applying pen or pencil tip, or other similar implements can damage the screen.

## Persistent Icons

Along the top right row of the screen are a series of icons that are continuously displayed.



Each indicates the status of a particular instrument condition. The icons are updated each time a measurement is made.

<b>Aperture Selection</b>	L U
<b>Specular Port Status</b>	⊙
<b>Remaining Calibration Interval</b>	⌚
<b>Backlight</b>	💡
<b>Remaining Battery Life</b>	🔋 ⏻ (?)
 Running on Battery	
 Plugged into Adapter and Charging	
 Battery Status Unknown	

**Aperture Selection.** The letter indicates the size of the aperture. For the Datacolor 110R, this icon never changes. There are two possibilities:

-  Large Area View
-  Ultra-small Area View

**Specular Port Status.** This icon indicates the current position of the specular port. For the Datacolor 110R, this selection is always “Gloss.”

- **Gloss.**  This icon indicates that two measurements are made for each sample, one SCI, and the other SCE. When these measurements are uploaded to the Paintmaker/Datacolor PAINT program on a PC, you can make adjustments to the measurement to simulate different gloss finishes.

**Remaining Calibration Interval.**  Indicates the time remaining before the next instrument calibration is required. When the top of the hourglass is black, there is time remaining before next calibration. When the top of the hourglass is white, the calibration interval has lapsed. The default calibration interval is 8 hours, and the user can change the calibration interval.

**Backlight.**  The PDA comes with a backlight to illuminate the display. Touching this icon turns the light on/off.

#### NOTE

The backlight can only be seen when the screen is viewed in a dark room with no ambient light.

#### Remaining Battery Life

- **Battery Icon.**  Indicates battery usage. When the unit is fully charged, four vertical lines appear in the battery. As the battery discharges, these lines start to disappear. The battery used by the Datacolor 110R is rechargeable. Each time you charge the battery pack, the unit is available for approximately 2,000 measurements.
- **Plugged Into Adapter and Charging.**  When 3/4 of the battery life has elapsed, connect the power adapter to the instrument. You can continue working and recharge the battery simultaneously. The battery is fully recharged in 4 hours.
- **Battery Status Unknown.**  When a question mark appears in the battery icon, the battery status is unknown. This occurs when there is no communication between the instrument and the PDA. *Refer to the Appendix, Hardware Troubleshooting and FAQ's for tips.*

#### NOTE

There are optional accessories available for charging and powering the Datacolor 110R. They include a stand-alone battery charger, and an automotive adapter that allows you to use the automobile lighter as a power source for Datacolor 110R. See *Appendix, Optional Accessories in this guide for details.*

### ***PDA Graffiti Pad and Control Panel***

Directly below the screen you will find additional icons and buttons that are also used to navigate through the program. This is referred to as the graffiti pad.



The icons on the graffiti pad are activated by touch. The icons used by Datacolor 110R include:

- **Home.** When the Datacolor 110R software is open, touching this at any time will return the user to the Main menu.
- **abc/123 (keyboards).** Touching this displays a keyboard you can use to name your samples. It includes options for upper case, lower case and numerical keypads.

#### NOTE

The cursor must be flashing in a 'name' field (i.e., folder, standard, batch tolerance block or tolerance) to enter characters using the keyboards.

- **Graffiti Pad.** You can use the stylus to write the name on the graffiti pad. The characters will appear in the field as you write them. See the documentation supplied with the PDA for instructions on the use of the graffiti pad.

#### NOTE



The row of icons at the bottom of the display includes standard options for the PDA. With the exception of the wireless communication status icons, these features are not used by the Datacolor 110R program.

## ***Control Panel***

At the bottom of the PDA are five (5) buttons.



This group of buttons is the “control panel”. Pressing any of these buttons wakes the PDA when it is asleep, and displays the main screen.

---

## **Routine Functions**

This section covers the functions you will run on a daily basis. They include instrument calibration and sample measurement.

### ***Instrument Calibration***

The instrument must be calibrated regularly to ensure that the measurements are accurate. The recommended calibration interval is 8 hours. The hourglass icon at the top of the screen indicates the elapsed time since the last calibration. When this interval has fully elapsed, the instrument ***must be recalibrated to make a measurement***. When calibrating, you must simulate the conditions under which you are making measurements. If you are measuring with the stapler foot in place, it must be attached during calibration, and the black trap and white tile must be positioned against the bottom of the foot.

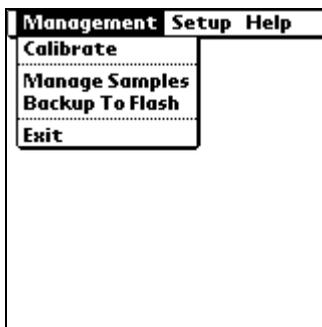
### ***Calibration Requirements***

- You will need the black trap and white tile to perform the calibration routine.
- If you will be using the stapler foot assembly to perform measurements, you must attach the stapler foot to the instrument before calibrating.
- The instrument should be calibrated at least every eight (8) hours. The icon at the top of the screen indicates the elapsed time since the last calibration for the aperture selected.

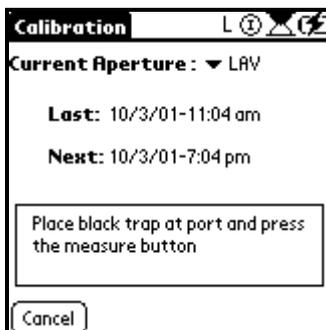
## Calibration Procedure

When you open the program, typically the instrument will need calibration, and the calibration procedure will begin automatically. If you need to start the calibration routine manually, do the following:

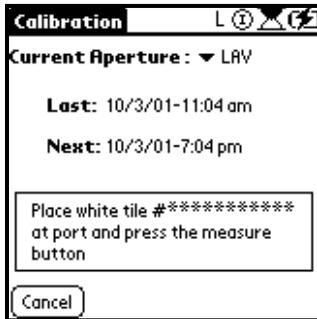
1. Tap **Datacolor** on the main window. The **Management** is displayed.



2. Tap **Calibrate**. The following screen appears:



3. With the black trap positioned at the instrument port, press the **Measure** button on the back of the unit. The instrument flashes multiple times. When it is finished, a message is displayed, prompting you to place the white tile (with the corresponding serial number) at the port.



4. With the white tile positioned at the sample port, press the Measure button. The instrument flashes four (4) times. When finished, it displays a message that calibration was successful, and returns to the main screen.

#### NOTES

If you are using the stapler foot, the opening on the stapler foot should be completely covered by the black trap.

The serial number on the screen should match the serial number of the white tile you are using.

*See Instrument Calibration Supplemental Information in the Appendix of this guide for additional information regarding calibration.*

## Calibration Interval

The system keeps track of the calibration interval and requires that you recalibrate periodically. The hourglass icon  at the top of the screen indicates elapsed/remaining time for the calibration. The same information is also displayed in a text message when you select the calibration option from the Management Menu.

#### WARNING

When the calibration interval has completely lapsed, **YOU WILL NOT BE ABLE TO MAKE A MEASUREMENT UNTIL YOU RECALIBRATE THE INSTRUMENT.** If the calibration interval has elapsed, you will receive a recalibration request when you press the **Measure** button, and the calibration screen will automatically appear.

*Refer to Management Options, Setup Menu, Preferences for explanations on setting/changing the calibration interval.*

---

## Measuring Samples

The measurement procedure is as follows:

- For flat samples, position the stapler foot over the area to be measured. The area to be measured must completely fill the circle in the center of the stapler foot.
- Press the **RED** Measure button on the back of the instrument.

### NOTE

When you are in the Datacolor 110R software, pressing the **Measure** button at any time will immediately trigger a measurement, regardless of the program option currently active.

## Sample Names

Every sample must have a name, and the system will automatically provide a name. **Autonaming** consists of assigning the label STD to a standard followed by a number (e.g. Std. 1) Standards are numbered sequentially based on the measurement order (STD 1, STD 2, STD 3, etc.).

### NOTE

If you choose not to save a measurement (e.g. STD 3), that number will not be reused. The next measurement will be called STD 4.

## Customizing Sample Names

You can assign a custom name to a sample after the measurement is made. You can also change a sample name at any time.

1. When the measurement is completed, the screen below appears.



2. The cursor is flashing on the line for the sample name. On the graffiti pad, tap the **abc** icon on the graffiti pad. Enter the name by tapping the keys on the keyboard.



3. When finished, tap **Done** on the keyboard.
4. Tap **Save** to save the measurement with the new name.

*NOTES*

# Management Options

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## About Management Options

The Management Options are used to calibrate the instrument, set the instrument features, manage sample data, and perform instrument diagnostics. To access this information, do the following:

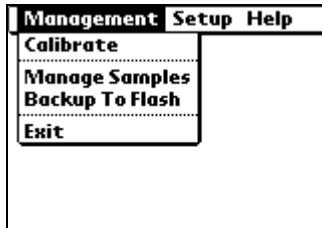
1. If you are not in the Datacolor 110R software, tap the **Datacolor** icon on the PDA desktop.



The Datacolor 110R main screen displays.



2. Tap **Datacolor** on the title bar. Three options display at the top: **Management**, **Setup** and **Help**.



The Datacolor 110R Management Options consist of three menus:

- **Management Menu.** Includes options to calibrate the instrument, manage sample data and to exit the Datacolor 110R software application on the PDA.
- **Setup Menu.** Provides access to the Preferences option. This controls system settings.
- **Help Menu.** Includes an option to display information about the instrument and software configuration, and provides access to the instrument diagnostics.

**NOTE**

To access the Management Options at any time, tap **Datacolor** at the top of the main screen. To return to the main screen, press any button on the Control Panel.

---

## Management Menu

This menu includes options to perform instrument calibration, manage sample data and backup the data on the PDA.

### ***Calibrate***

The instrument must be calibrated regularly to ensure that the measurements are accurate. The hourglass icon at the top of the screen indicates the elapsed time since the last calibration. When this interval has fully elapsed, the instrument ***must be recalibrated to make a measurement.*** Refer to the Appendix, *Instrument Calibration Supplemental Information* for additional information regarding calibration.

When calibrating, you must simulate the conditions under which you are making measurements. If you are not using the stapler foot when measuring the samples, you should remove it during calibration. If you are measuring with the stapler foot in place, it must be attached during calibration, and the black trap and white tile must be positioned against the bottom of the foot.

### ***Calibration Requirements***

- You will need the black trap and white tile to perform the calibration routine.
- If you will be using the stapler foot assembly to perform measurements, you must attach the stapler foot to the instrument before calibrating.
- The instrument should be calibrated at least every eight (8) hours for each aperture setting. The icon at the top of the screen indicates the elapsed time since the last calibration for the aperture selected.

## Calibration Procedure

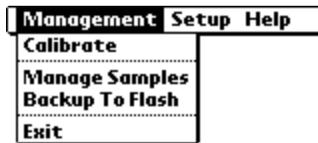
See *Routine Functions, Calibration Procedure* for instructions to calibrate the instrument.

## Manage Samples

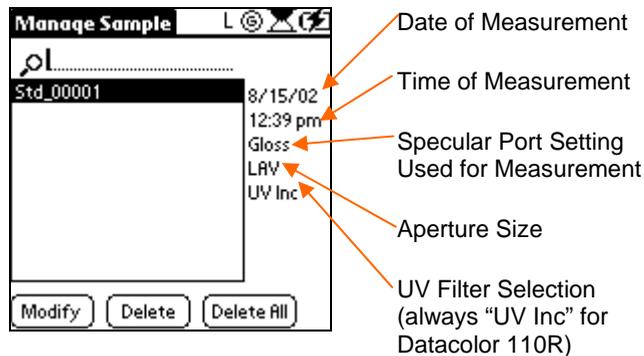
This feature provides options to modify and delete sample data stored on the Datacolor 110R. In the case of modifying data, you are limited to changing the sample name or deleting samples.

### Modifying a Sample

1. On the main window, tap **Datacolor** to display the Management Menus.



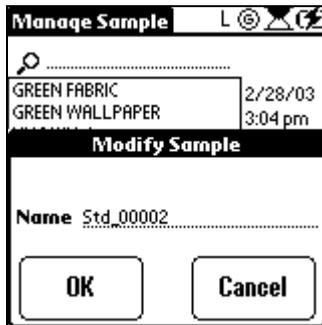
2. From the Management Menu, tap **Manage Samples**. The Sample Management screen displays. This screen displays specific measurement information about the sample currently selected.



- From the list of standards, tap the standard to be modified. It will be highlighted.



- To change the name, tap **Modify**. The screen below displays and the cursor will be flashing at the end of the name.

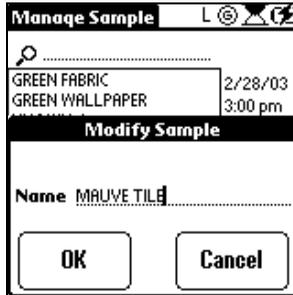


- Tap the **123** icon on the graffiti pad to display the keyboard.



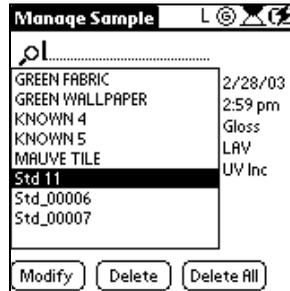
- In the Keyboard screen, tap the **Backspace key** to erase the current text.
- Use the screen keyboard or the keypad on the PDA to enter the new text.

- If you need to include numbers in the sample name, tap **123**. A number pad will appear, and you can add numbers to the name.



- When you have finished entering the text, tap **Done** to exit the keyboard. The new name will appear in the Modify Sample screen.

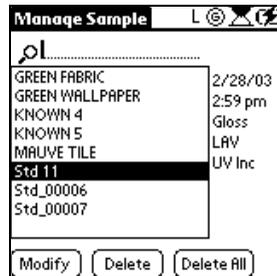
6. Tap **OK**. The new name will appear in the sample list.



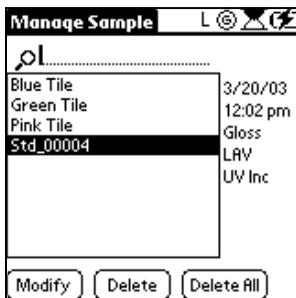
## Deleting a Standard

Use this function to delete a standard.

1. Tap the **Datacolor** title bar on the main window and, from the Management Menu, tap *Manage Samples*. The **Manage Samples** screen displays.



- From the list of standards, tap the standard you want to delete.



- Tap **Delete**. A confirmation message box is displayed.

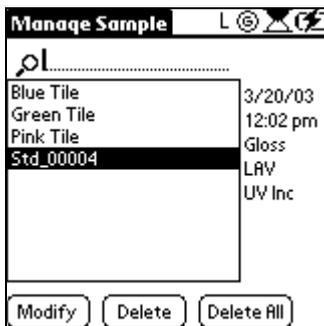


- To delete the standard, tap **OK**. Otherwise, tap **Cancel** to cancel the delete process.

## Delete All Samples

If you need to delete all of the samples in the folder, you can do this through a single option.

- From the Management Menu, tap **Manage Samples**.



2. Tap **Delete All**. A confirmation message box will appear.



3. Tap **OK** to delete all samples. If you are unsure, tap **Cancel**.

## Setup Menu

### About the Setup Menu

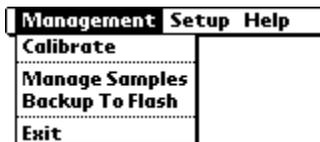
This menu is limited to a **Preference** option. From this screen you can edit system settings, including the sleep interval for the instrument and the PDA, date, time and other settings.

### Preferences

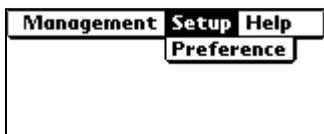
1. In the title bar of the main window, tap **Datacolor**.



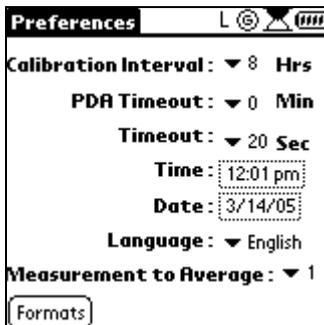
The Management Menu is displayed.



- From the Management Menu, tap the **Setup**. The Setup Menu displays.



- Tap **Preference**.

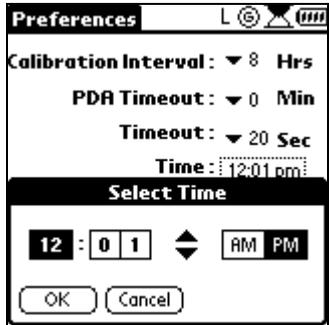


- Make your selections based on the guidelines provided below.

OPTION	DESCRIPTION
<b>Calibration Interval</b>	Specifies the maximum number of hours to elapse before instrument recalibration. Once the calibration interval has elapsed, you will NOT be able to make a measurement until you recalibrate. Tap the down arrow (▼) and select the calibration interval to use. The default is 8 hours.
<b>PDA Timeout</b>	Specifies the number of minutes of inactivity to elapse before the PDA goes into <i>Sleep</i> mode. The default is 2 minutes. Tap the down arrow (▼) and select from the available options.
<b>(Instrument) Timeout</b>	Specifies the number of seconds to elapse between measurements before the Datalog 110R (instrument) goes into <i>Sleep</i> mode. Placing the instrument in <i>Sleep</i> mode extends the life of the battery. The default is 20 seconds. Tap the down arrow (▼) and select the number of seconds for the Datalog 110R timeout.

OPTION	DESCRIPTION
--------	-------------

<b>Time—Current Time</b>	Tap in the <i>Time</i> field to display the <b>Select Time</b> screen. Then, make the selections in the hour, minute and AM/PM fields by tapping in the field, and tapping the up/down arrow until the desired value is shown.
--------------------------	--



<b>Date—Current Date</b>	Tap in the <i>Date</i> field to display the <b>Select Date</b> screen.
--------------------------	--



**Year.** Tap the left/right arrow until the desired year is shown.

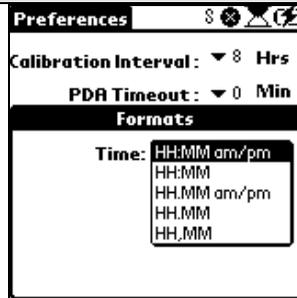
**Month.** Tap in the block for the desired month.

**Day.** Tap on the day of the month. When you make this selection, the *Select Date* screen automatically closes.

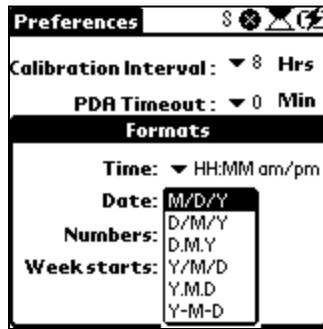
**Today.** To automatically use today's date, tap *Today*.

*To specify the format for this field, see "Formats" discussed below.*

OPTION	DESCRIPTION
<b>Language-- Current language</b>	Cannot be edited on the Datacolor 110R.
<b>Measurement to Average</b>	<p>The software can collect several reads for a single sample and average them. This feature is used when the surface of the sample being measured is not uniform (i.e., textiles, textured paint, embossed surfaces, etc.).</p> <p>You can average a maximum of 9 reads to create a single spectral curve for a sample. Tap the down arrow (▼) and select the number of reads to be included in the average measurement.</p>
<b>Formats</b>	<p>This option is used to select the date, time, and week start formats. When the formats are changed, they are applied to all applications software on the PDA. In addition, with respect to data gathered by the Datacolor 110R application, all displays reflect the changes including data originally stored using a different format.</p> <p>Tap <b>Formats</b>.</p>  <p>Tap the down arrow (▼) for each field, and tap on the desired format option. When all selections are made, tap <b>Done</b>.</p> <p><b>Time Format.</b> You can specify the order of the information displayed (hour/minute), the symbol used to delimit numbers, and the start day for the week. Below are the choices:</p>

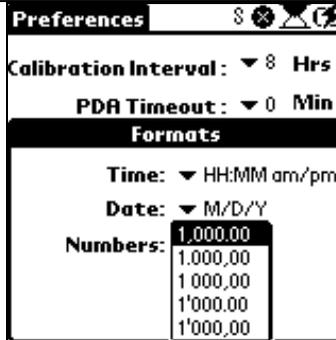
**OPTION****DESCRIPTION**

**Date Format.** You can specify the order of the information (day/month/year) displayed. This is applied to all of the applications programs included on the PDA; it is not limited to the Datacolor 110R application. Below are the choices:

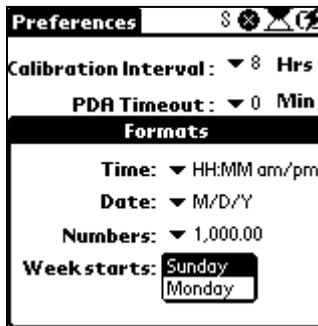


**Numbers Format.** You can specify the symbol used to delimit the information. This is applied to all of the applications programs included on the PDA; it is not limited to the Datacolor 110R application. Below are the choices:

OPTION	DESCRIPTION
--------	-------------



**Weekstarts Format.** You have the option to have all calendar information reflect the starting day of the week as either Sunday or Monday. This is applied to all of the applications programs included on the PDA; it is not limited to the Datacolor 110R application. Below are the choices:



## Help Menu

### *About the Help Menu*

The Help Menu provides access to instrument diagnostics and information about the Datacolor 110R PDA software.

**NOTE**

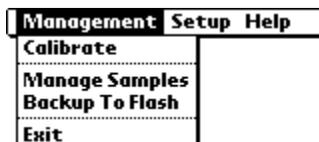
Currently there is no online help available for the Datacolor 110R software.

To access the Help Menu, do the following:

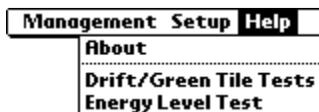
1. On the main window, tap **Datacolor**.



The Management Menu displays.



2. Tap the **Help Menu**. The menu below appears:

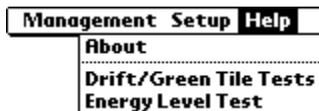


### ***About Option/Software Verification***

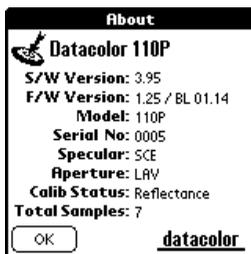
The version numbers for the software and firmware on your unit are requested whenever you contact the manufacturer regarding technical support. The software and firmware version numbers are found on the PDA.

To access this information, do the following:

1. Tap **Help**. A drop-down menu displays.



2. Tap **About**. A screen displays with details regarding the current instrument configuration, and the software and firmware versions contained on the unit.



## NOTES

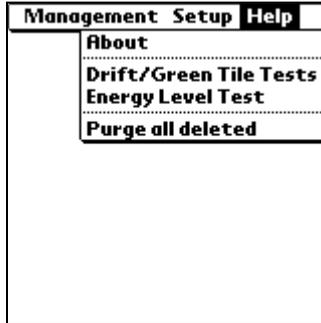
When working with Datacolor Technical Support, you will be asked for this information.

If no information regarding the instrument appears on the *About* screen, this indicates that the instrument is not calibrated. When calibrated, all details about the instrument are displayed.

OPTION	DESCRIPTION
<b>S/W Version</b>	Identifies the version of the software stored on the PDA. Version for Datacolor 110R must be 1.0 or higher.
<b>F/W Version</b>	Two programs are used to run the instrument. This field identifies the version number of each.
<b>Model</b>	This field identifies the instrument model you are using.
<b>Serial No.</b>	The instrument serial number is identified by a sticker on the back of the unit. It is also stored in the software and displayed in this field.
<b>Specular</b>	Reports the current position of the specular port. <b>SCI</b> indicates the specular port is closed. <b>SCE</b> indicates that the port is open.
<b>Aperture</b>	Identifies the aperture size available for the instrument. For Datacolor 110R, there is only one aperture size.
<b>Calib Status</b>	Reflectance. This is the only option for Datacolor 110R.
<b>Total Samples</b>	Identifies the number of samples currently stored in the unit.

## Instrument Diagnostics

The software includes three diagnostic tests that are used to evaluate and troubleshoot instrument performance. These tests are located on the Help Menu:



### Diagnostic Tests

**Drift/Green Tile Tests.** This option provides access to two tests that evaluate the repeatability of the instrument.

- **Drift Test.** Tests the repeatability of the instrument over a short interval. Color differences between measurements made over a specified time interval are displayed. They are expressed in CIEL\*a\*b\* units.
- **Green Tile Test.** Test the repeatability of the instrument over its lifetime.

**Energy Level Test.** Tests (1) energy output of the light source, and (2) function of the spectrometer. This test is designed for use by Datacolor representatives, and should be run under the direction of Datacolor service personnel.

### Instrument Setup for Diagnostic Options

To prepare the instrument for the diagnostic tests:

- The instrument should be recalibrated before any diagnostic tests are performed.
- Plug the Datacolor 110R into its power adapter for all diagnostic tests.

## Drift Test

This test is used to check the repeatability of the instrument over a short interval. The white tile is used as the sample, and the first scan of the tile is used as the *Standard*. Each scan that follows is treated as a batch, and the color coordinates/color difference **between the standard scan and each of the subsequent scans are calculated.**

### NOTE

The results of the current Drift Test are not stored. When the user exits the option, the test results are lost.

### Running the Drift Test

1. From the Management Menus, tap **Help Menu, Drift and Green Tile Tests**. The screen below appears:

	STD	AVG	MAX	D	SD
L*	0.00	0.00	0.00	0.00	0.00
a*	0.00	0.00	0.00	0.00	0.00
b*	0.00	0.00	0.00	0.00	0.00
C*	0.00	0.00	0.00	0.00	0.00
h	0.00	0.00	0.00	0.00	0.00
DE*			0.00	0.00	0.00
X	0.00	0.00	0.00	0.00	0.00
Y	0.00	0.00	0.00	0.00	0.00
Z	0.00	0.00	0.00	0.00	0.00

- **Test.** The same screen is used for both the Drift and Green Tile tests. Tap **Drift** to run the Drift Test.
  - **Meas.** Enter the number of reads to be performed. The default is 10. The first measurement will be the standard, and 10 “batch” scans will be compared to it.
  - **Delay.** Time between reads. This is expressed as seconds.
2. Place the white tile at the instrument port, and tap **Start**.

### Drift Test Results

	STD	AVG	MAX	D	SD
L*	95.80	95.80	0.01	0.09	
a*	-0.71	-0.72	-0.03	0.03	
b*	1.25	1.26	0.02	0.02	
C*	1.44	1.45	0.03	0.03	
h	119.51	119.80	0.02	0.61	
DE*			0.04	0.00	
X	84.50	84.50	-0.01	0.00	
Y	89.52	89.52	0.02	0.09	
Z	94.21	94.19	-0.02	0.00	

- **STD.** Values for the standard.
- **AVG.** An average of the batch values for the parameter identified.
- **MAX D.** The largest delta value for the parameter identified, across all batches.
- **SD.** The standard deviation for the parameter identified, based on the batch measurements.

## Green Tile Test

The Green Tile test is used to test the repeatability of the instrument over its lifetime. A measurement of the green tile is stored in the calibration file before the instrument leaves the factory. This test scans the green tile, compares it to the stored measurement of the tile, and reports the color difference between the stored measurement and the current measurement.

### NOTE

The results of the current Green Tile Test are not stored. When the user exits the option, the test results are lost.

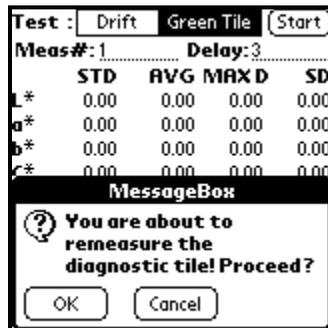
## Storing/Restoring Green Tile Values

New Datacolor 110R users do not have to store green tile values into the calibration file. However, you may need to restore a green tile reference measurement if the battery totally discharges and you have lost the original measurement.

### WARNING

Consult the Datacolor Service Department before restoring new green tile values.

1. Select the **Green Tile** diagnostic option.
2. Place the green tile at the instrument port.
3. Press the **Measure** button on the back of the instrument. You will receive the following message:



- Press **OK** to proceed or **Cancel** to cancel. When you select OK, the instrument will immediately measure the tile and store the new tile values. **No additional warning will appear!**

## Running the Green Tile Test

- From the Management Menus screen, tap **Help Menu, Drift and Green Tile Tests**. The screen below appears:

Test :		Drift	Green Tile	(Start)	
Meas#:		1	Delay: 3		
	STD	AVG	MAX	D	SD
L*	95.80	95.80	0.01	0.09	
a*	-0.71	-0.72	-0.03	0.03	
b*	1.25	1.26	0.02	0.02	
C*	1.44	1.45	0.03	0.03	
h	119.51	119.80	0.02	0.61	
DE*			0.04	0.00	
X	84.50	84.50	-0.01	0.00	
Y	89.52	89.52	0.02	0.09	
Z	94.21	94.19	-0.02	0.00	
Drift Test Complete					

- Test.** The same screen is used for both the Drift and Green Tile tests. Tap **Green Tile** to run the Green Tile Test.
  - Meas.** Enter the number of reads to be performed. The default is 1. The current measurement will be compared to the green tile values stored in the calibration file.
  - Delay.** Time between reads. This is expressed as seconds.
- Place the green tile at the instrument port, and tap **Start**.

## Green Tile Test Results

Test :		Drift	Green Tile	(Start)	
Meas#:		1	Delay: 3		
	STD	AVG	MAX	D	SD
L*	56.79	56.79	-0.01		
a*	-30.19	-30.19	0.00		
b*	15.37	15.34	-0.03		
C*	33.88	33.87	-0.01		
h	153.02	153.06	0.02		
DE*			0.03		
X	17.30	17.29	-0.00		
Y	24.71	24.71	-0.01		
Z	17.92	17.93	0.01		
Green Tile Test Complete					

- STD.** Values for the standard. These are stored in the calibration file.
- AVG.** An average of the batch values for the parameter identified.

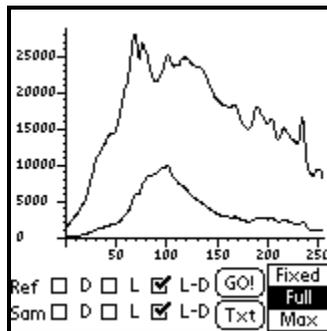
- **MAX D.** The largest/highest batch value for the parameter identified.
- **SD.** The standard deviation for the parameter identified, based on the batch measurements.

**NOTE**

When you make a single measurement, no data appears in the SD column.

## Energy Level Test

The Datacolor 110R is a dual-beam spectrophotometer, and this test measures the energy detected through both the Reference channel and the Sample channel. It tests the following: (1) energy output of the light source, and (2) function of the spectrometer.



All data can be displayed for the Reference channel, the Sample channel, or both.

**WARNING**

This test is designed for use by Datacolor representatives, and should only be run under the direction of Datacolor service personnel.

## Running the Energy Level Test

To start the Energy Level test, do the following:

- From the Management Menus screen, tap **Help Menu, Energy Level Test**. The screen will go blank, and the LED on the front of the unit will change from green to amber. The measurement is in progress.

When the test is completed, the screen will display a graph of the results.

**NOTE**

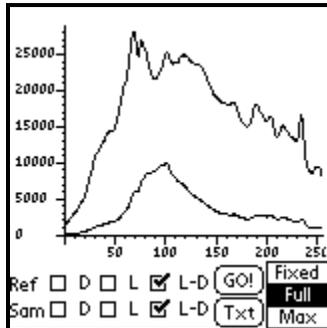
The white tile should be placed at the instrument port, before you make any selections, because the test begins immediately when the option is selected.

## Energy Level Test Results

The results of the energy level test can be displayed in either graphic or text format.

### Graphic Display

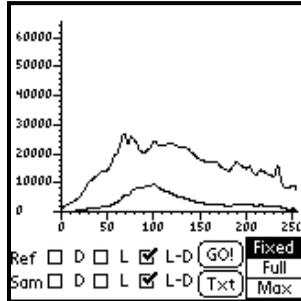
The graphic display is the default display. When the measurement is completed, the screen below displays:



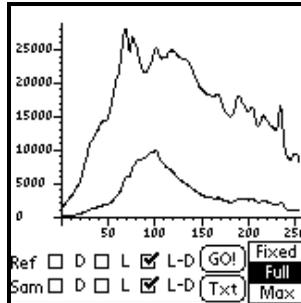
Tap to place a check in the box for the data to be displayed. Tap again to remove the check.

- **Ref.** Data on this line is read from the Reference channel.
- **Sam.** Data on this line is read from the Sample channel.
- **D (Dark Level).** Displays the energy output recorded when no light is present.
- **L (Light Level).** Displays the energy output recorded when the light source is active.
- **L-D (Light energy level – dark energy level).** The value recorded when the measurement is corrected for noise.
- **Txt.** The results of this test are displayed in either graphic or text format. This display is interchangeable.
  - When the graphic display is active, the button is labeled “TXT.”
  - When text display is active, the button is labeled “GR.”
  - Tapping on this button will change the display format, and allows the user to quickly move between the displays to evaluate the test results.
- **Go/Stop.** Tap **Go** to start the measurement process. The instrument will continue measurements until the user taps **Stop**.

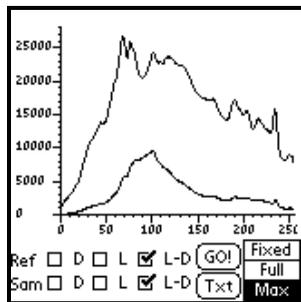
- **Fixed.** The x-axis displays the entire range of values for this test.



- **Full.** The x-axis values run from the minimum to the maximum value for the current measurement.



- **Max.** The x-axis values run from 0 to the maximum value for the current measurement.



## Text Display

This view displays the values for each parameter measured.

REFERENCE	VALUE	DIODE
DARK MIN		
DARK MAX		
LIGHT MIN		
LIGHT MAX		
L-D MIN	1084	0
L-D MAX	22444	68
-----	S/R [x]	58.880
SAMPLE	VALUE	DIODE
DARK MIN		
DARK MAX		
LIGHT MIN		
LIGHT MAX		
L-D MIN	6	2
L-D MAX	14050	121

Ref	<input type="checkbox"/> D	<input type="checkbox"/> L	<input checked="" type="checkbox"/> L-D	GO!	Fixed
Sam	<input type="checkbox"/> D	<input type="checkbox"/> L	<input checked="" type="checkbox"/> L-D	Gr	Full
					Max

- **Reference.** Displays the values for the Reference channel.
- **Sample.** Displays the values for the Sample channel.
- **Value.** Actual value recorded for each item.
- **Diode.** Identifies the diode associated with the value displayed.
- **Dark Min.** The lowest value recorded when no light is present.
- **Dark Max.** The highest value recorded when no light is present.
- **Light Min.** The lowest value recorded when the light source is active.
- **Light Max.** The highest value recorded when the light source is active.
- **L-D Min.** The lowest value recorded when the measurement is corrected for noise.
- **L-D Max.** The highest value recorded when the measurement is corrected for noise.
- **Fixed.** N/A for text output.
- **Full.** N/A for text output.
- **Max.** N/A for text output.

# Data Backup/Retrieval Functions

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## About Data Backup/Retrieval Functions

For everyday operation, all of the programs and data you use are located on the PDA. However, a removable memory card is provided with each unit.



### NOTE

The memory card on the right is fitted with a “write protect” device. When enabled, it prevents you from copying information to the card.

This offers a simple, fast means of backing up the data that you collect. We recommend that your data be backed up daily. If you are running multiple shifts, you should back up the data following each shift.

The memory card can also be used to restore the program, in the unlikely event that the program on the handheld unit becomes corrupted.

---

## Data Backup to the Memory Card

1. If the memory card is not in the unit, insert it into slot provided for it. The label faces front you as you insert the card.



2. Re-enter the Datacolor 110R software by tapping on the **Datacolor icon**.

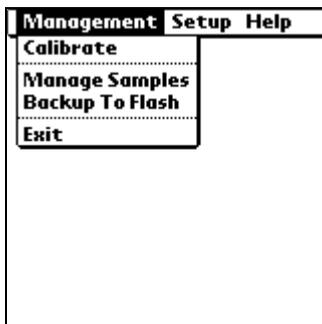


Datacolor

The Datacolor 110R main menu displays.



3. Tap **Datacolor**. The Management Menu appears:



4. Tap **Backup to Flash**. The screen below appears:



5. Tap **Backup**. This copies files from the PDA to the removable memory card. While the copy is in progress, a confirmation dialog box is displayed with the message, "Copying databases." When the copy is complete, the dialog box displays.
6. Tap **Exit**. The Datacolor 110R main menu displays.

#### **WARNING**

Do not remove the memory card while the data transfer is in progress. Doing this will corrupt the data.

---

## Data Retrieval from the Flash Card

#### **WARNING**

Using this procedure will overwrite all data on the PDA. This procedure should **ONLY BE USED** if you have lost or corrupted the data on the PDA.

1. Install the memory card in the unit.
2. Repeat steps #1 - #5 from the **Backup to Memory Card** procedure.

3. At step #6, select **Retrieve**. This copies files from the memory card to the PDA. If the databases already exist on the PDA, the program displays a dialog box, informing the user that the file already exists on the handheld unit.

**NOTE**

There are 11 data files specific to the Datacolor 110R program.

4. Tap **Yes** to overwrite the data in the folder on the RAM. Or, tap **Yes to All** to overwrite all of the existing Datacolor 110R data on the RAM with the data from the card.

While the copy is in progress, a confirmation dialog box is displayed with the message, *"Copying databases."* When the copy is completed, the dialog box displays.

5. Tap **Exit**. The Datacolor 110R Main Menu displays.

## ***Flash Card Removal***

The flash card in the unit is spring loaded. To remove it:

- Press down on the card with your finger, and then immediately remove it.



The card will spring out of the memory card slot.

# Datacolor 110R™ and Datacolor SPECTRUM Programs

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## Overview

In addition to its stand-alone functions, the Datacolor 110R can be connected or tethered to a desktop PC to be used as the primary measuring instrument for all Datacolor programs.

In addition, data collected by the Datacolor 110R can be transferred to the desktop PC for use with Datacolor PAINT. It is also possible to share this data with other Datacolor SPECTRUM programs. The Datacolor Portables Desktop program and Palm® Desktop program are required to perform these data transfers.

### NOTE

For a complete discussion of all data transfer features included with the Datacolor Portables program, see the Datacolor CHECK II User's Guide (part no. 4230-0399M).

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## Datacolor 110R and Datacolor SPECTRUM Programs

You can connect a Datacolor 110R to a computer to be used as the measuring instrument for a Datacolor program. This is referred to as “tethered” mode.

You must assemble the Datacolor 110R cable (refer to *Instrument, Instrument Cable* in this guide for assembly and connection instructions), and attach one end to the Datacolor 110R and the other to a communications port (serial or USB) on the back of the computer. You must also have available the diskette or CD containing the calibration data for the calibration tile you are using (these are included in the instrument shipment).

## NOTES

When you are running in “tethered” mode, use the power adapter as the Datacolor 110R power source. This will limit conflicts that occur if the instrument is in *Sleep* mode when you attempt to make a measurement.

If you are connecting the instrument to a USB port, you must load additional software. See *Appendix, Datacolor 110R Configuration for a USB Port in this guide for detailed instructions.*

*Refer to the individual program user’s guide for details regarding software and instrument installation, and for calibration procedures to be used when the Datacolor 110R is tethered to a Datacolor program.*

## SPECIAL NOTE REGARDING DATACOLOR PAINT

The driver automatically installed by Datacolor PAINT does not work with other Datacolor SPECTRUM programs. If you are using several Datacolor programs including Datacolor PAINT, you must use the Datacolor SPECTRUM driver with Datacolor PAINT. See *Datacolor PAINT User’s Guide, Appendix, for instructions to install the Datacolor SPECTRUM driver.*

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## Datacolor 110R Data Exchange

You can transfer the data collected by Datacolor 110R for use with Paintmaker or Datacolor PAINT. This transfer is initiated from inside the Paintmaker/Datacolor PAINT program. When the data transfer option is selected, it automatically launches two programs:

- Datacolor Portables Sync Wizard
- Palm® Desktop

The data transfer can be performed using both traditional wired and wireless technologies. When choosing a wireless method, you have the choice of either Bluetooth® or Wi-Fi technology.

Once the data is transferred, you can use Paintmaker/Datacolor PAINT/ to run matches and corrections to these samples.

## NOTE

The data on the Datacolor 110R can be exchanged with other Datacolor products, using the Datacolor Portables program. The documentation for the Datacolor Portables Program in this guide is limited to the functions used for the Paintmaker/Datacolor PAINT application.

## Installing the Software

The process of transferring sample data from a standalone Datacolor 110R to the Paintmaker/Datacolor PAINT program requires that you install 3 programs onto the desktop PC:

- Palm® Desktop program (Palm CD)
- Datacolor Portables Desktop Program (Datacolor 110R CD)
- Paintmaker/Datacolor PAINT

### Palm® Desktop(Palm CD)

This is a program provided by Palm and was included with the Datacolor 110R unit. It is found on a CD labeled Palm. **THIS MUST BE INSTALLED FIRST!**

- Place the Palm CD in the drive. A wizard will be launched to guide you through the installation procedure.

### Datacolor Portables Desktop Program

This program is found on the Datacolor Portables Desktop program CD. Place the CD in the drive, and select **Setup**. A wizard will guide you through the installation. When it is installed, two *shortcuts* are added to the Windows Desktop:



- **Datacolor Portables Sync Wizard.** In a typical Paintmaker/Datacolor PAINT application, the user will never run the Datacolor Portables Sync Wizard as a stand-alone program. This function is automatically launched from the data transfer option in Paintmaker/Datacolor PAINT.
- **Datacolor Portables Desktop Program.** For Paintmaker/Datacolor PAINT applications, the Datacolor Portables Desktop will only be used to replace white tile data on the stand-alone Datacolor 110R unit. See *Appendix, Replacing White Tile Data* in this guide for detailed instructions to replace the white tile data.

## Paintmaker/Datacolor PAINT

To successfully use the data transfer feature, you must be running the following POS program version:

- Paintmaker v. 2.2.52 or higher.
- Datacolor PAINT v. 1.0 or higher

## Preparing for Data Transfer

The transfer procedure requires specific configurations for the instrument, hardware and software.

### Wired Transfer

You must use the custom cable provided with the stand-alone Datacolor 110R to connect the instrument to the computer. It is the same cable that is used to connect the Datacolor 110R to its power adapter. See **Instrument Cable** in this guide for instructions on cable assembly and cable connections.

#### NOTES

To connect to a USB port using a wired connection, you must install additional software to the PC. See *Appendix, Datacolor 110R Configuration for USB port* in this guide for instructions to install this software.

Connect the Datacolor 110R to its power adapter for the data transfer procedure.

### Wireless Transfer

Two wireless transfer methods are supported:

- Bluetooth® Wireless Connection
- Wi-Fi

To enable a wireless data transfer, you must configure the desktop computer and the Datacolor 110R. See *Appendix, Wireless Data Transfer Configuration for information to setup this feature*. We strongly recommend you consult the technical documentation provided by the manufacturers of these wireless data communications systems for instructions to properly configure your system.

## Performing the Data Transfer

Once the software is installed and the connection is properly configured, you can transfer the data from the Datacolor 110R to Paintmaker/Datacolor PAINT.

To transfer the data, do the following:

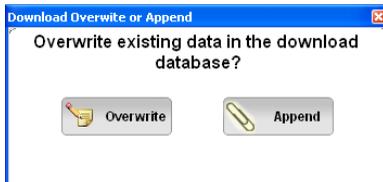
1. From the Windows desktop, click the **Paintmaker/Datacolor PAINT icon**.



2. On the Paintmaker/Datacolor PAINT main screen, click the **Options** tab. The Options page displays:



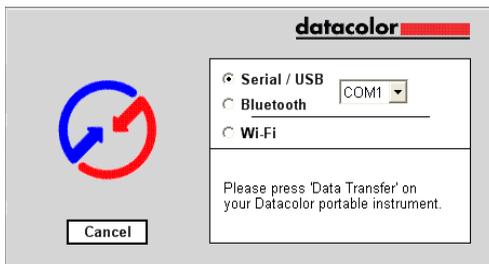
3. On the Options screen, click **Download Data**. The program prompts you for data overwrite instructions:



**NOTE**

This overwrite instruction is applied to the data on the PC.

4. Select **Overwrite** or **Append**. The *Datacolor Portables Sync Wizard* dialog box below displays.



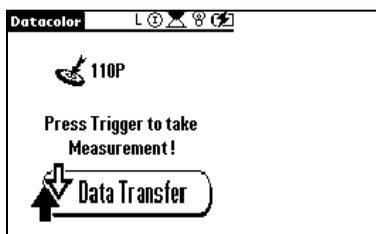
This instruction is applied to the database used by Datacolor PAINT/Paintmaker.

5. Select the type of connection you are making, and the com port to be used.

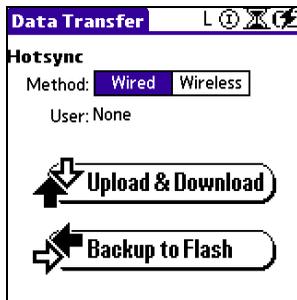
**NOTE**

If you are using wireless transfer options, you must configure the Datacolor 110R and the desktop PC to recognize the signal. See *Appendix, Wireless Data Transfer Configuration for additional information.*

6. On the Datacolor 110R main menu, tap **Data Transfer**.

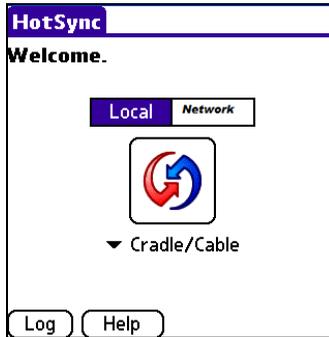


The Data Transfer screen displays.

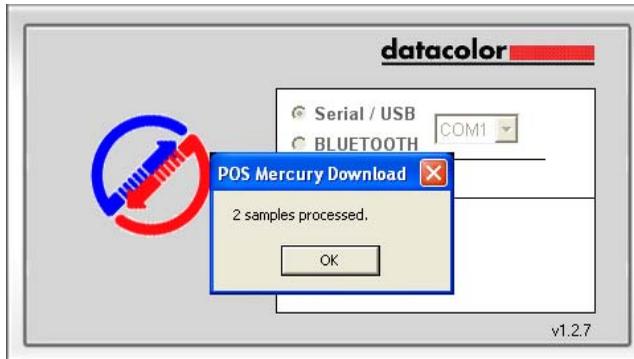


- Select the type of connection, *Wired* or *Wireless*, you are making.
7. Tap **Upload & Download**.
    - For *Wired* connections, the synchronization begins immediately. Continue to step #8.

- For *Wireless* connections, the HotSync screen displays.



- **Local.** This is the connection type for Bluetooth users.
  - **Network.** This is connection type for WIFI users.
  - When you have made this selection, tap the **HotSync icon.** The data transfer will begin.
8. When the transfer is completed, on the Datacolor 110R tap **Finish.** The transfer procedure is not finished. The samples are being transferred into the Paintmaker/Datacolor PAINT database. When this transfer is completed, the confirmation message below is displayed on the desktop PC:



9. When this message appears, click **OK.** The Paintmaker/Datacolor PAINT Options Menu displays.
10. Click **Back.** You can now use the sample data in Paintmaker/Datacolor PAINT to run a match or correction, or you can exit the Paintmaker/Datacolor PAINT program.



# Datacolor Portables Desktop Program

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## Overview

The Datacolor Portables Desktop is designed to transfer data between a Datacolor 110R and any Datacolor program.

For Paintmaker/Datacolor PAINT applications, the Datacolor Desktop Portables program must be installed to transfer any data from the Datacolor 110R to the desktop PC. It provides the following functions:

- Transfer data from the Datacolor 110R to the Paintmaker/Datacolor PAINT database. It runs automatically as part of the Paintmaker/Datacolor PAINT Download option.
- Transfer white tile calibration data (included on a diskette or CD from Datacolor) to a stand-alone Datacolor 110R. This is done when the white calibration is replaced. The user must launch the Datacolor Portables Desktop to complete this function.

This program resembles the Windows Explorer program, using similar formats and navigation devices. It is provided on the Datacolor Portables Desktop CD included with the Datacolor 110R unit. *Refer to the instructions provided with the disk to install the software.*

### NOTES

The Palm Desktop program must be installed in order for the Datacolor Portables Desktop program to run.

The documentation for the Datacolor Portables Program in this user's guide is limited to the functions used for the Paintmaker/Datacolor PAINT application. For a complete discussion of all of the features included with the Datacolor Portables program, and the procedure for transferring data between a Datacolor 110R and other products, *refer to the Datacolor CHECK II User's Guide (part no. 4230-0399M).*

## Import/Export Features

The **Datacolor Portables Desktop** provides import and export functions. These options allow data to be exchanged between Datacolor 110R and other Datacolor programs. For the Paintmaker/Datacolor PAINT application, only one *Import* feature (*Import White Tile Data*) is used.

### Import White Tile Data

If the white calibration tile is replaced due to damage or loss, you must replace the white tile data on the Datacolor 110R. When incorrect white tile data is used in the calibration procedure:

- It is not possible to compare the data measured by two different instruments.
- It is not possible to compare measurements using the same Datacolor 110R made before and after the calibration data is changed.

Datacolor will provide a replacement tile and a new calibration file. If you have received a new white tile, you must replace the white tile data in the Datacolor 110R PDA, to make the instrument calibration valid.

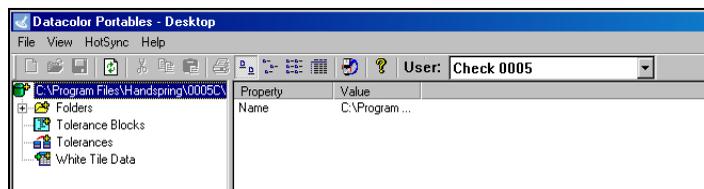
See *Appendix, Installing White Tile Data* for step-by-step instructions to import white tile data.

## Getting Started with the Datacolor Portables Desktop Program

- To launch the *Datacolor Portables Desktop*, double click the Datacolor Portables Desktop icon.



The Datacolor Portables Desktop main window displays.



## Navigation Conventions

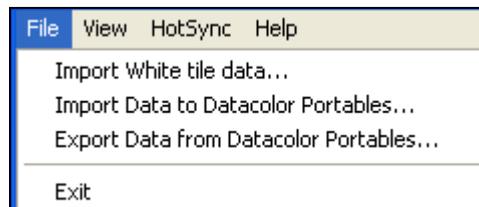
Windows programs typically offer the user more than one way to execute a function. These include selecting options from the drop-down menus, clicking on screen icons, or using shortcut keys.

### Menus

The **Datacolor Portables Desktop** uses a menu bar similar to those found in other Windows programs.



When you click the menu headings, a drop-down menu displays. When a drop-down menu appears, click the option you want to use.



Functions that are 'grayed out' are not currently available.

### Mouse Keys

To activate some menu options, you must click the **left button** the mouse. Others require you to click the **right button**. Similarly, some functions are executed with a single mouse click, while others require two clicks. In this documentation, when you are instructed to click the mouse, click the left mouse key once, unless the instructions are explicit regarding the mouse button to use.

## Datacolor 110R Database on the Computer

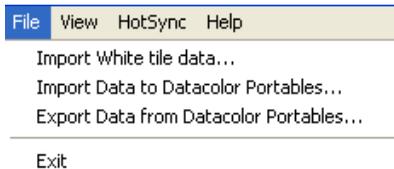
The data transferred from the Datacolor 110R PDA to the computer are stored in a database created for Datacolor 110R data. Since it is possible to have multiple Datacolor 110R units, each unit is assigned a separate database, identified by the serial number of the Datacolor 110R unit.

If the Datacolor 110R you are using does not appear in the list of Users displayed in the **Datacolor Portables Desktop**, it has not yet been synchronized with the desktop PC you are using. See *Appendix, Data Synchronization for instructions to perform the data synchronization using the Datacolor Portables program.*

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## File Menu

The File Menu includes the import and export options offered by the program. The option most commonly used for the Paintmaker/Datacolor PAINT application is "Import White Tile data."



- To access the File Menu, move to the menu bar, and click **File**. The menu above displays.

### NOTE

The documentation for the Datacolor Portables Program in this manual is limited to the functions used for the Paintmaker/Datacolor PAINT application. To see documentation for all of the options on the File Menu, see the Datacolor Check User's Guide (part no. 42300396M).

## Import White Tile Data

This option is used to transfer white tile data from a portable media to a Datacolor 110R PDA. If you have received a new white tile, you must use this feature to replace the white tile data the Datacolor 110R PDA. *See also Appendix, Installing White Tile Data for detailed instructions to complete the data replacement.*

### View White Tile Data

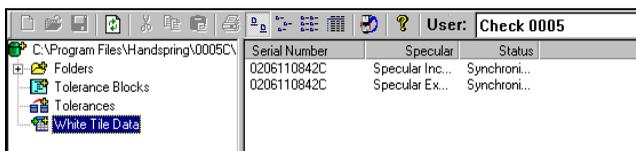
White tile data is stored in two files, each containing a single measurement of the tile. One file contains a measurement made *Specular Included* (SCI) and the other is made *Specular Excluded* (SCE). Both files must be transferred to the stand-alone instrument, in order for the new calibration data to be valid.

If you have imported white tile data from a diskette or CD, you can view the values using the **Datacolor Portables Desktop**.

To view the white tile data:

1. Select the correct Datacolor 110R **User**.

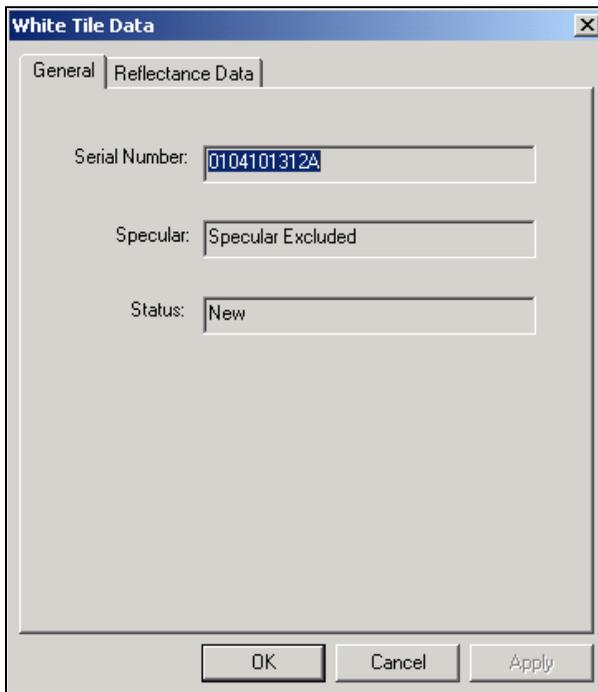
2. Highlight the **White Tile** folder in the left pane. A list of the files containing white tile data displays in the right pane.



3. Place the cursor over one of the files in the right pane, and right-click the mouse. The White Tile Data shortcut menu displays.



4. Click **View Data**. The White Tile Data dialog box displays.

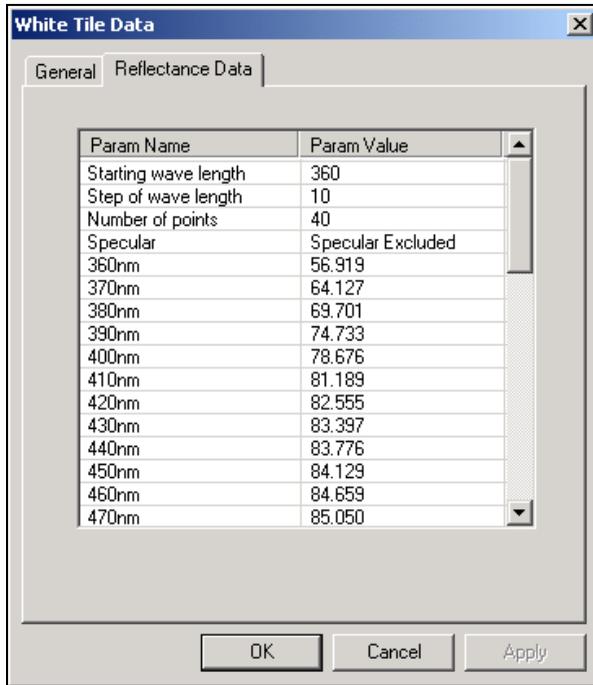


This is the default display for viewing white tile data.

OPTION	DESCRIPTION
<b>Serial Number</b>	The serial number for the white tile. It must match the number of the white tile used for calibration.
<b>Specular</b>	Indicates the position of the specular port when the white tile data was measured. White tile data is stored in two files, and each contains a measurement of the tile. One measurement is made Specular Included, and the other is made Specular Excluded. You should have two files, representing the tile data for each specular condition.
<b>Status</b>	Indicates whether the data has been changed since the last data transfer. <b>New.</b> This record has been added to the computer database after the last data transfer. It will be added to the Datacolor 110R PDA during the next data transfer. <b>Modified.</b> The folder data in the computer database has been changed since the last data transfer. During the next data transfer, the changes to this folder will be updated the Datacolor 110R PDA. <b>Synchronized.</b> No changes have been made to the folder data on the computer since the last synchronization.

### Reflectance Data Tab

This tab reports the instrument parameters at the time of the white tile measurement, and the reflectance values of the tile.



OPTION	DESCRIPTION
<b>Starting Wavelength</b>	Identifies the starting wavelength for the spectral data. Different wavelength ranges are offered with Datacolor instruments, and white tile data is provided to cover the complete wavelength range of all instruments. While the wavelength range <i>for the calibration data</i> is always 360nm–750nm, the wavelength range for Datacolor 110R instrument is 400nm – 700nm
<b>Step of Wavelength</b>	The wavelength interval used for the reflectance report. It is always 10nm.
<b>Number of points</b>	This is the number of points reported in the spectral data. The maximum number is 43.
<b>360 nm – 750nm</b>	This identifies the wavelength associated with each reflectance value displayed.

### Delete White Tile Data

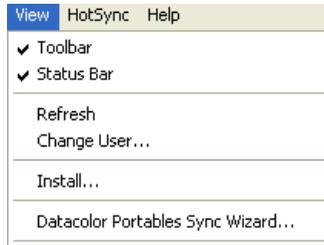
You cannot delete folders containing white tile data.

---

## View Menu

The View Menu provides options that configure the screen display and data display for the program.

- Move to the menu bar, and select **View**. The View menu displays.



### ***Toolbar and Status Bar Options***

A check next to either of these bars indicates that they are currently displayed. To remove either bar from the display screen:

- Place the cursor over the option, and press the left mouse key once. The check will disappear.
- To add the bar to the display screen, place the cursor over the option, and press the left mouse key once. The check displays.

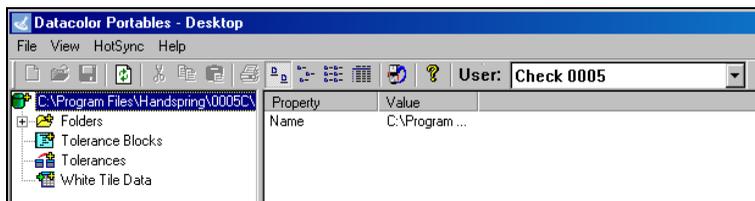
**Toolbar.** The Toolbar is the bar directly below the Menu Bar at the top of the screen. It contains icons that access specific program functions.



**Status Bar.** The status bar is found the bottom of the screen, immediately above the taskbar. It contains information about the current date and time, the contents of the active folder, and indicates the settings of various hardware and software conditions.

### ***Refresh***

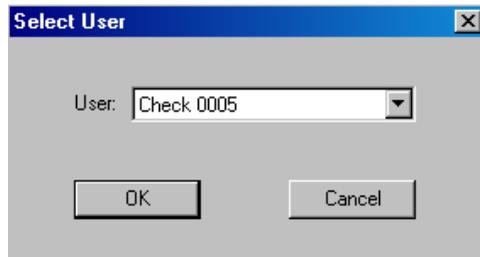
This option will refresh the screen display, and restore the data display to the default view.



## Change User

In Datacolor PORTABLES you can only view data for one instrument. When you have several Datacolor 110R units, the User selection identifies the data being displayed. To change the user (instrument) selected:

1. Click **View menu, Users**. Use the drop-down list arrow to display the choices.



2. Click on the desired user. The new user will appear in the field, and the display will update.

## Datacolor Portables Sync Wizard

*Not applicable for Datacolor 110R users connecting to Paintmaker/Datacolor PAINT.*

*To see the full documentation for the Datacolor Portables Sync Wizard, see the Datacolor Check II User's Guide (part no. 4230-0399M).*

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## HotSync Menu

The HotSync Menu provides access to the settings in the Palm HotSync Manager program. You may need to make adjustments to these settings if you do not successfully complete a data transfer from Paintmaker/Datacolor PAINT. See *Appendix, Settings for HotSync Manager for correct settings.*

*NOTES*

# Appendix: Supplemental Information

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## Instrument Specifications

ITEM	DESCRIPTION
<b>Description</b>	One-piece tower configuration portable spectrophotometer. Customized PDA interface
<b>Size</b>	9.7 cm x 9,5 cm x 24,1 cm 3.85 in x 3.75 in. x 9.7 in.
<b>Display</b>	160 x160 pixels 5.7 cm x 5.7 cm 2.25 in. x 2.25 in.
<b>Weight</b>	1 Kg/2.2 lbs.
<b>Measuring Principle</b>	Dual beam sphere Automatic specular port
<b>Measuring Geometry</b>	Diffuse illumination 8° viewing in conformance with CIE publication No. 15.2 Colorimetry
<b>Light Source</b>	Pulsed xenon Optional UV calibrator
<b>Spectral Range</b>	400 – 700nm
<b>Effective Bandwidth</b>	10nm
<b>Wavelength Bandwidth</b>	2nm
<b>Spectrometer Principle</b>	Concave holographic grating
<b>Detector</b>	Proprietary active pixel dual 256 element diode array
<b>Sphere Diameter</b>	51mm/2 in.
<b>Measuring Range</b>	0 – 200% reflectance

ITEM	DESCRIPTION		
<b>Measurement Time</b>	< 2.5 seconds		
<b>Aperture Sizes</b>	<b>Type</b>	<b>Illuminated</b>	<b>Measured</b>
	LAV	15 mm	11 mm
	USA V	6.5 mm	2.5 mm
<b>Repeatability</b>	0.03 CIELAB DE maximum (white tile, 2-flash measurement)		
<b>Reproducibility</b>	0.15 average CIELAB DE, 12 BCRA tiles		
	0.25 CIELAB DE maximum		
<b>Battery</b>	Replaceable lithium ion		
<b>Battery Life</b>	>2,000 measurements low battery warning		
<b>Battery Recharge Time</b>	4 hours		
<b>AC Power Pack</b>	100-240 VAC, 50-60hz, 15 watt		
<b>Operating Environment</b>	5° - 40°C maximum		
	20% -85% relative humidity		
	Maximum altitude 2,000 meters		
<b>Input Power Requirements</b>	6.5 VDC		
	2.3 Amperes max.		

---

## Hardware Troubleshooting and FAQ's

Problem	Solution
<b>Instrument isn't responding. Cannot measure standalone or from PC.</b>	If the instrument (NOT the PDA) is not responding (i.e., the LED stays RED and/or you cannot measure or calibrate, either as a stand-alone unit, or from Paintmaker/Datacolor PAINT), hold down the measure button until the LED goes OFF (takes about 7 seconds). This is equivalent to physically removing the battery. This method does not cut the power to the PDA.
<b>Receiving communications error messages when using the Datacolor 110R tethered to a Datacolor application.</b>	Use the power adapter with the <b>Datacolor 110R</b> to prevent the unit from going into <i>Sleep</i> mode while connected to the PC.
<b>The PDA is "dead." There are flashing lines across the screen. The application displays an error and hangs.</b>	<p>These three problems are the result of the PDA becoming unstable. This can happen due to a low battery, but a bug in the software or a data corruption may also cause it.</p> <p><b>Resetting the PDA</b></p> <p>Remove the screw that holds the PDA cassette, and tilt the cassette forward. Do NOT detach the ribbon cable. We would strongly suggest that you run from the power adapter.</p> <p>On the back of the cassette there is a small hole. This is the reset button of the PDA.</p> <p>Use the reset tool included with the stylus to reset the PDA.</p>

---

**Problem****Solution**

---



Insert this tool into the hole in the back of the PDA.



This should reset it. If the screen refreshes and the PDA desktop is displayed, tap on the Datacolor 110R icon.

---

**Aperture report is 'none'.**

The battery power has dropped so low that the PDA cannot check the instrument status. You must recharge the battery.

---

Problem	Solution
<b>Battery status unknown</b>	<ul style="list-style-type: none"> <li>• When a question mark appears in the battery icon, the battery status is unknown. This occurs when there is no communication between the instrument and the PDA.</li> <li>• Try to calibrate the instrument. If a connection is established, the normal battery icon will be displayed.</li> <li>• Recharge the batteries. After charging for 4 hours, remove adapter and check battery status.</li> <li>• If battery status remains 'unknown', contact Datacolor.</li> </ul>
<b>The Led on the front of the instrument changes colors constantly. Instrument does not work.</b>	The battery is low. Connect the power adapter.
<b>During measurement the LED flashed briefly and then the instrument died.</b>	The battery level is too low to complete a measurement. Charge the battery. <b>IMPORTANT!</b> If this happens after you have charged the battery, it may be an indication that your battery is defective. Contact technical support.
<b>Lines appear across the PDA when instrument is activated for the first time.</b>	<p>The battery discharged during storage/shipping making the PDA unstable.</p> <ol style="list-style-type: none"> <li>1. Connect the instrument to the power adapter. While connected to power reset the PDA. Unit should remain connected to the adapter for 4 hours to allow the battery to charge.</li> </ol>
<b>Unit displays "communication failures" after working for some time</b>	The battery is low, but not completely discharged. After some use, the instrument stops responding (LED cycles red-green-yellow-red-green-yellow, etc.), and a 'communication error' appears displayed on the screen. Charge the battery.
<b>When connected to Paintmaker/Datacolor PAINT as the measuring instrument, Datacolor 110R stopped working for no apparent reason. The PC software reported communication error. The instrument is still working fine standalone</b>	The problem maybe a hardware defect within the specific unit. Have the unit serviced.

Problem	Solution
<b>Datacolor 110R will not hold a charge, but will run from the power adapter.</b>	Either the battery or the battery charging circuit in the unit is defective. The unit must be serviced.
<b>The calibration screen shows "*****" for white tile.</b>	<p>The PDA has lost its memory, either because the battery has fully discharged or you have performed a "Hard Reset."</p> <p>You need to restore the white tile data from flash.</p> <p><b>WARNING</b></p> <p>The flash card supplied with each instrument contains the white tile data specific to the unit. If you exchange flash cards between instruments and perform backup/restore operations, you will end up with the wrong white tile data on the unit.</p>
<b>The instrument does not allow me to do a backup or restore.</b>	If the battery level is too low, the software will not allow you to retrieve from, or back up to flash. Charge the battery.
<b>I have the Datacolor 110R application on a PDA with no instrument. The Datacolor 110R software takes a very long time to load.</b>	The software is looking for an instrument. Simply wait. The same thing happens if you try to go to the calibration screen.

## Wireless Data Transfer Configuration

This section provides additional information concerning the configuration of the system (Datacolor 110R and desktop PC) for wireless data transfer.

- The Palm Desktop software uses the same port assigned to the instrument by Datacolor programs. This port cannot be opened for two different applications. Because of this, the Palm Desktop software is not automatically launched at startup.
- If you change the data transfer type, or edit any settings in the Palm Desktop software, you should launch the Palm software from the Datacolor Portables Desktop program. The Datacolor Portables program closes the Palm application, which ensures that the port is available to transmit measurement data to other Datacolor programs, including Datacolor PAINT/Paintmaker.
- When the port is closed, the desktop PC cannot communicate with the Datacolor 110R unit for purposes of data transfer. However, the Datacolor 110R can be used as a tethered measuring device for other Datacolor programs.
- You cannot make a wireless spectral measurement using the Datacolor 110R.

## Bluetooth Configuration

You need the following components to activate the Bluetooth wireless synchronization with Datacolor 110R:

- Palm® Desktop software installed on computer.
- Datacolor Portables software installed on computer.
- Bluetooth Enabled Desktop PC. Consult the user guide for your Desktop PC or Bluetooth card for setup instructions.
- Bluetooth Enabled Palm device.

To activate the Bluetooth wireless data synchronization for the Datacolor 110R you must complete the following steps:

Configuration Step	Device
1) Install Palm Desktop program on the PC.	Desktop PC. This program must be installed before you install Datacolor Portables.
2) Install Datacolor Portables program on the Desktop PC.	Desktop PC
3) Create a virtual serial port on the Desktop PC. Instructions for completing this are provided either with your Desktop PC or with the Bluetooth card.	Desktop PC
4) Configure the Palm Desktop software on the PC for a Bluetooth wireless connection.	Desktop PC
5) Configure the Datacolor 110R for a Bluetooth wireless connection.	Datacolor 110R PDA

### NOTES

You should be located at the console of the desktop PC being used for synchronization. This procedure requires that you make some selections on the PC to start the synchronization.

These instructions assume that the Datacolor 110R and the desktop PC have never been synchronized.

## Datacolor CHECK II Bluetooth Setup

You must perform 2 steps to enable a Bluetooth connection between the Datacolor CHECK II and the Desktop PC.

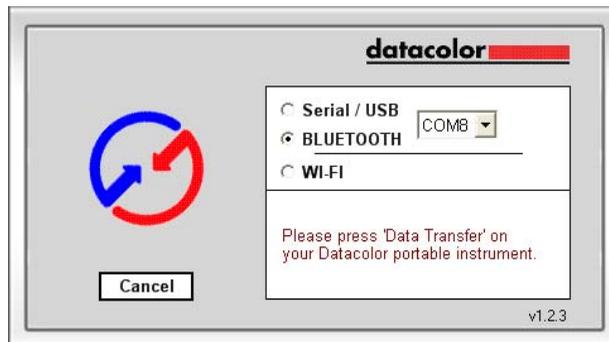
1. Configure the Datacolor Portables Sync Wizard on the desktop PC.
2. Activate the Bluetooth wireless connection on the Datacolor 110R PDA.

## Configure the Datacolor Portables Sync Wizard

1. From the desktop icon, launch the Datacolor Portables Sync Wizard.



The window below displays:



2. Verify that the com port selected is the virtual com port for the Bluetooth connection, created on the desktop PC.
3. Click the radio button to enable Bluetooth. The Hotsync icon is placed in the system tray in the lower right corner of desktop.



You can now activate the wireless connection on the Datacolor 110R unit.

## Activate Datacolor 110R Bluetooth Connection

You must enable and configure the Bluetooth communication on the Datacolor 110R PDA. Below are the instructions.

1. On the status bar, tap the **Bluetooth** icon.



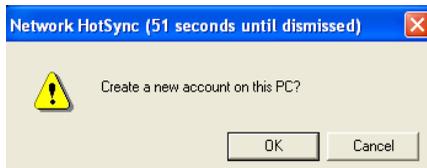
The Bluetooth options display.

2. Tap **Prefs**. The Bluetooth screen displays.



- *Bluetooth*. Tap **On** to enable the Bluetooth feature.
  - *Device Name*. Displays the name assigned to the Datacolor 110R. This is assigned at the Datacolor factory.
  - *Discoverable*. Should be set to **No**.
3. Make corrections as needed, and tap **Setup Devices**. The Bluetooth Setup Wizard opens.
  4. Tap **Bluetooth Hot Sync**. The Bluetooth Hot Sync Setup Wizard displays.
  5. Tap **Next**. The Bluetooth Hot Sync Wizard continues.
    - *Virtual Serial Port* window. Tap **Next**.
    - *Hot Sync Manager*. Tap **Next**.
    - *Enable Local Serial*. Tap **Next**.
  6. Tap **Launch Hot Sync**.  
On the **PC**, you are prompted to create a new account PC.

- Click **OK**, and the synchronization starts.



**NOTE**

This prompt is only displayed on the desktop during the first synchronization.

## WIFI Configuration

You need the following components to activate a WIFI wireless synchronization with Datacolor 110R:

- Palm® Desktop software installed on computer.
- Datacolor Portables software installed on computer.
- WIFI-Enabled Desktop PC. Consult the user guide for your PC or WIFI card for setup instructions.
- WIFI-Enabled Palm device.

The procedure to activate the WIFI wireless data synchronization for the Datacolor 110R requires the following steps.

Configuration Step	Device
1) Install Palm Desktop program on the PC.	Desktop PC This program must be installed before you install Datacolor Portables.
2) Install Datacolor Portables program on the PC.	Desktop PC
3) Configure the Datacolor Portables Sync Wizard to recognize the Wi-Fi connection.	Desktop PC NOTE. When you access the synchronization options directly from Datacolor TOOLS or Datacolor PAINT, this configuration is automatically handled.
4) Activate the wireless connection on the Datacolor 110R PDA.	Datacolor 110R PDA
5) Configure the Hot Sync Manager settings on the PDA.	Datacolor 110R PDA

## Before You Begin

You will need the following information to successfully enable a WIFI connection between the PC and the Datacolor 110R:

<b>Wi-Fi Access Point</b>	PDA must be 75 – 150 feet from the Wi-Fi device. Your network administrator can provide the location.
<b>Network Name (SSID)</b>	The name of the wireless network. The network may be configured to hide the network name. Your network administrator can provide the information.
<b>Encryption Key (optional)</b>	Your network may use encryption to protect data. If so, you will need to enter this code into the PDA. The Palm T/X supports two encryption systems. WEP and WPAPSK. Your network administrator can provide the information.
<b>TCP/IP Setting</b>	The name and address of the PC. You need to enter this into the Datacolor 110RI wireless configuration. This is obtained from the Palm HotSync Manager program on the desktop PC.

These instructions assume the following regarding the PC setup.

- You are using an access point router to connect to the wireless network. If you are using a peer-to-peer (ad-hoc) connection, see the Palm documentation.
- The Datacolor 110R and the PC have never been synchronized.
- The PC is in the same IP range as the handheld.
- The Palm Desktop software is installed on the PC.
- The Datacolor Portables program is installed on the PC.

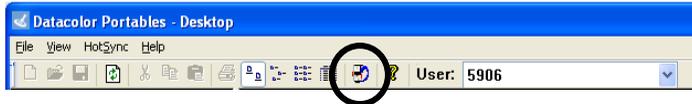
## Datacolor 110R WIFI Setup

You must perform 3 steps to enable the WIFI connection between the Datacolor 110R and the desktop PC:

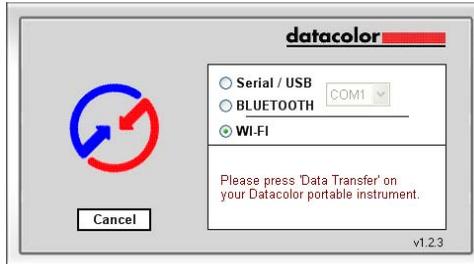
- Configure the Datacolor Portables Sync Wizard on the desktop PC.
- Activate the wireless connection on the Datacolor 110R PDA.
- Configure the Hot Sync Manager on the PDA.

## Configure the Datacolor Portables Sync Wizard

1. On the Portables toolbar, click on the Sync Wizard icon to launch the Datacolor Portables Sync Wizard:



The window below displays:



2. Click the radio button to enable Wi-Fi. If you receive a Firewall Blocking message when you select WIFI, click **Unblock** to continue.



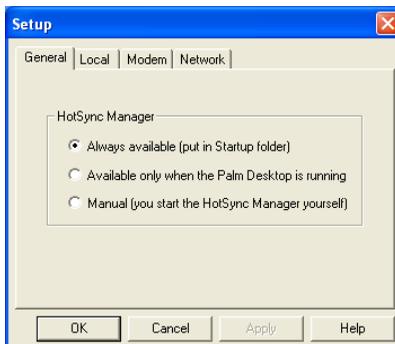
The Hotsync icon will be placed in the system tray:



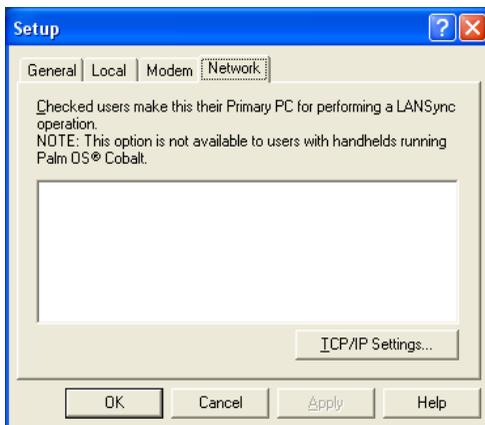
3. Right click on the Hot Sync icon to display the HotSync Manager menu:



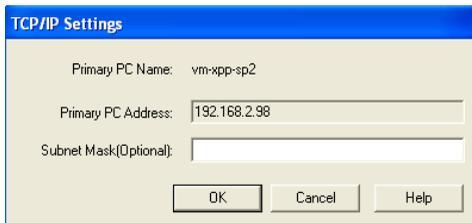
4. From the main menu, click **Setup**.



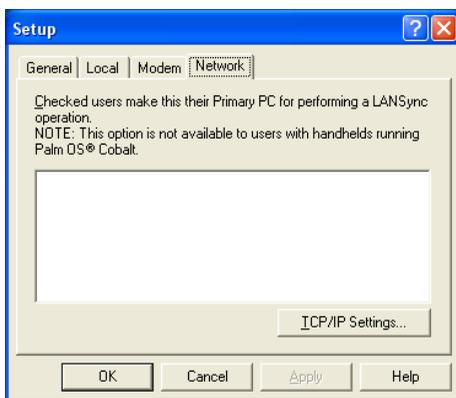
5. Click the **Network** tab.



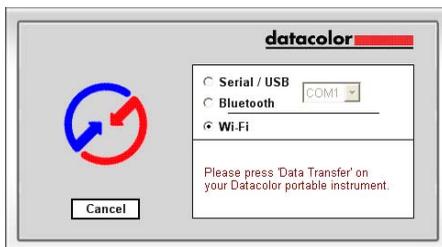
- Click on **TCP/IP Settings**. The TCP/IP Settings dialog box displays.



- Record the information in the *Primary PC Address* field. You may need to input this information into the wireless setup on the Datacolor 110R PDA.
- Click **OK**. The Setup dialog box displays.



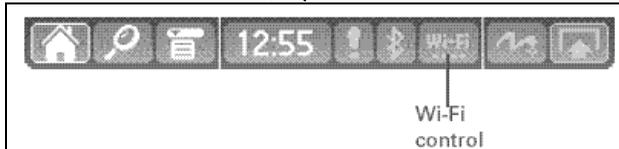
- Click **OK**. The Sync Wizard displays.



You can now activate the wireless connection on the Datacolor 110R unit.

## Activate Wireless Connection on PDA

1. Close the Datacolor 110R application on the PDA.
2. From the PDA status bar, tap the wireless connection icon.



### NOTE

If the Wi-Fi icon shown above is not included on the status bar, tap on this icon:



The WI-FI screen displays.



3. In the *Wi-Fi* field, tap the down arrow and select **On**.
4. Tap **Scan/Setup**. The Wi-Fi Networks screen displays:



The network you are using should be displayed in this list.

5. Tap to select it and continue to step # 9.

6. If the correct network is not displayed, tap **Edit**.



7. Tap **Add**.



8. Using the (virtual) PDA keyboard, enter the *Network Name* provided by the network administrator.
9. In the *Security* field, tap the down arrow and select the correct security method. If None is the selection, go to step #9.
10. If the security type selected requires a key, the Network WEP Key screen displays.



- In the *Key Type* field, highlight the type of code to be entered.
- In the *Key* field, use the (virtual) PDA keyboard to enter the security code.

11. When all of the information is entered, type **OK**. The New Wi-Fi Network screen displays.



12. Tap **OK**. The program prompts you to start the connection immediately.

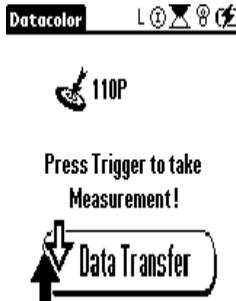


13. Tap **Yes** to connect. A confirmation message displays. The utility closes and the wireless icon on the status bar changes to indicate a connection exists.

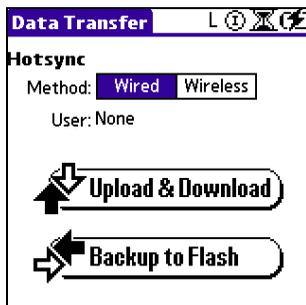
You are now ready to configure the Hot Sync Manager on the PDA.

### Configure the Wireless Connection on the PDA

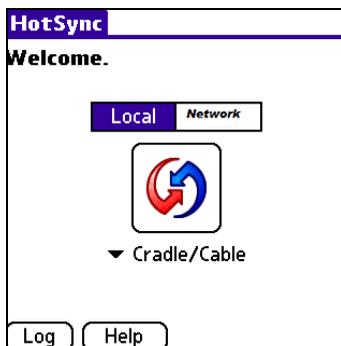
1. Launch the Datacolor 110R PDA application.



- From the main menu tap **Data Transfer**.



- Tap **Wireless**, and then **Upload & Download**. The Hot Sync screen displays.



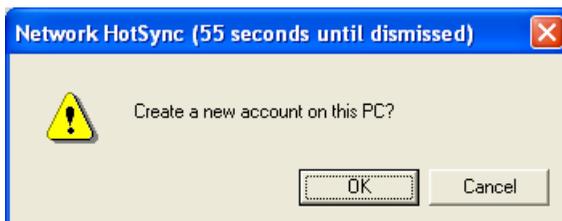
- Tap **Network**.
- Tap the drop-down arrow below the *Hot Sync* icon, and tap **Select PC**. This field is in the same location as the Cradle/Cable field shown. The Network Hot Sync Setup displays. A list of existing networks displays.

To create a new connection, tap **Other**, and enter the IP address for your computer.

**NOTE**

This number was collected during step #7, Activating Wireless Connection on a PDA.

6. Tap **Next**. The device immediately attempts to connect to the wireless network. For a new connection, a dialog box displays on the **desktop PC**, which prompts you to create a new account:



7. Click **OK**. The synchronization starts immediately.

---

## Datacolor 110R Configuration for USB Port

The Datacolor 110R can be connected to a USB port on a desktop system. Three software selections must be made to enable the USB port for use with the instrument:

1. Install the USB Driver.
2. Identify the system assignment for the USB port. This is accessed through the **Control Panel** included with the Windows operating system.
3. Change the com port assignment in the Datacolor applications software.

Below are detailed instructions to configure the system to use a USB port.

### ***Before You Begin***

- Close all programs currently running on the system.
- You will need the accessories below to complete the installation:
  - **USB cable** (provided by Datacolor)
  - **Datacolor CD-ROM disk** *labeled* USB Drivers and Documentation

## USB Driver Installation

Install the CD labeled **USB Drivers and Documentation** into the CD Rom drive.

1. 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:



This screen is automatically replaced by the *New Hardware Wizard*:



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



3. 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 it, and click the mouse. The check will disappear.
4. When you have completed your selections, click **Next**.

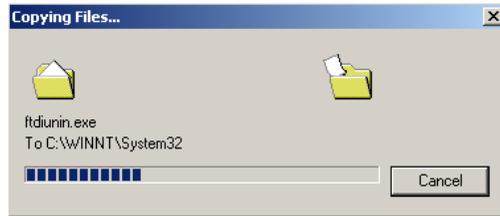


5. A default location appears in the *Copy manufacturer's files from* field.
  - If the driver software is in a different location click **Browse**, and identify the correct location.

- 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:



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



When the copy is complete, the window below appears:



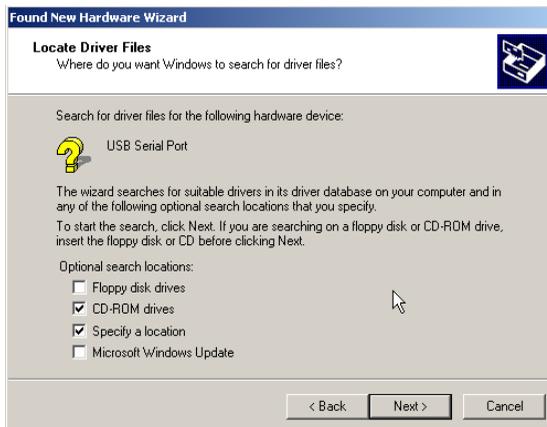
7. Click **Finish**. **Do not remove the USB Driver CD from the drive.** The Wizard will close, and then immediately reopen and repeat the procedure. You must complete it a second time to successfully copy the file.



8. Click **Next**.



9. Click **Next**.



10. When the process is completed, the window below appears:



11. Click **Finish**. You can now remove the USB Drivers CD.

## ***Viewing/Changing System USB Port Assignment***

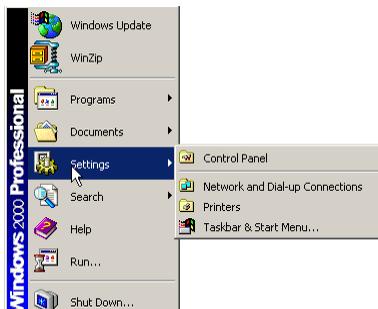
As part of this process, a port number is assigned to the USB port. The default selection is the next available com port. You will need to know this port assignment to configure the Datacolor applications program(s) to recognize the USB port. The procedure for viewing/editing this assignment follows:

To view or change the com port assignment for the USB port, you must open the **Control Panel**.

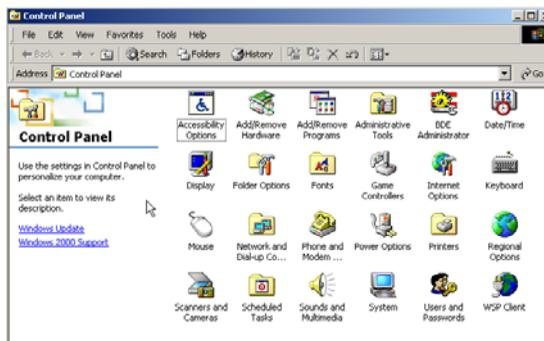
1. To access the Control Panel, click on the **Start** icon at the bottom left of the screen.



2. From the list of menu option, click **Settings**.



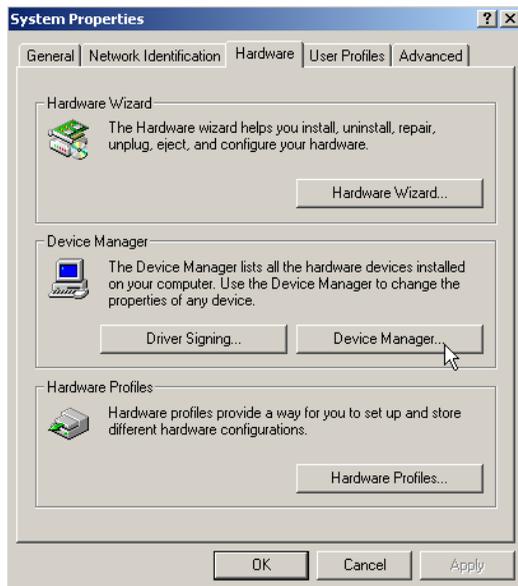
3. From the Settings menu, click **Control Panel**. The window below appears:



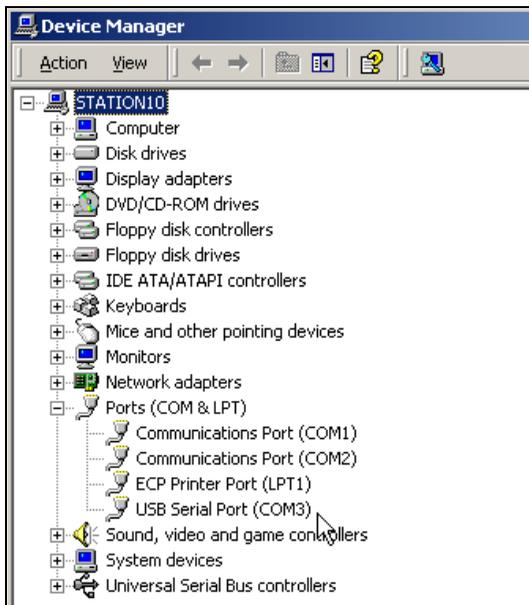
4. Click **System**. The Systems Properties window appears:



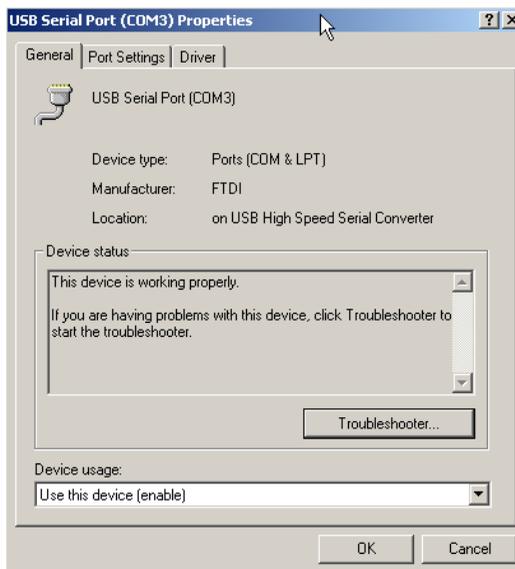
5. Click on the **Hardware** tab at the top of the window.



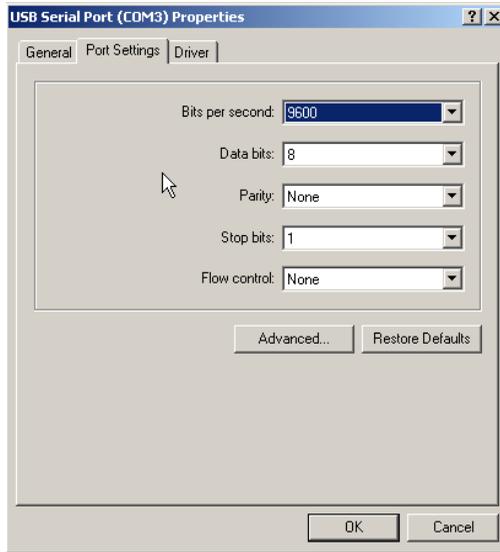
6. Click on **Device Manager**. The window below appears:



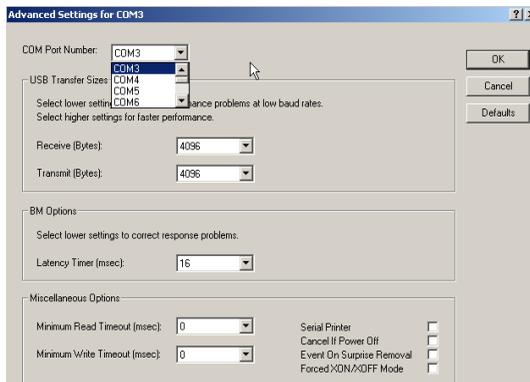
7. Go to the **Ports** heading. Click on the **+** to display the port selections. Click on **USB Serial Port**. The window below appears:



8. Click on **Port Settings**. The window below appears:



9. Click **Advanced**. The Advanced Settings for [COM Port] displays:



The field labeled **Com Port Number** displays the current assignment for the USB port. To change the port setting, click on the down 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**.

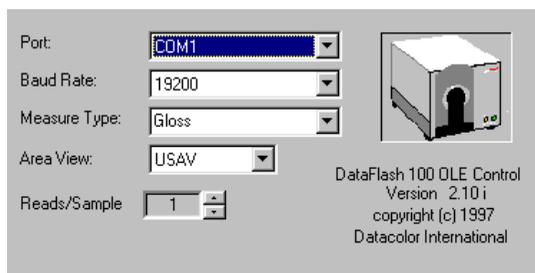
## Changing the USB COM Port Assignment

To enable the USB port for color measurements, you may need to change the com port assignment in the applications program. While this procedure varies depending on the particular program, it is typically accessed through an **Instruments Menu**, or **Instrument Setup** icon. Below are instructions for configuring Paintmaker/Datacolor PAINT. If you are not running Paintmaker/Datacolor PAINT, refer to the user's guide for the individual application program you are running, for instructions to configure the instrument.

### Datacolor 110R and Paintmaker/Datacolor PAINT

In the Paintmaker/Datacolor PAINT™ software program, you must confirm the com port assigned to the USB port.

- From the Paintmaker/Datacolor PAINT main screen, select **Options, Instrument Setup**. The screen below appears:



- **Port.** Enter the identification of the USB port. If the default selection is not correct, click on the down arrow. A list of the available com ports will be displayed. Highlight the com port assigned to the USB port. The new com port should then be displayed in this field.
- **Baud Rate.** The correct baud rate for all Datacolor instruments is 19200.
- **Measure Type.** Click the drop down list, and select **Gloss**.
- **Area View.** For a 110R, this should be either LAV or USAV.

#### NOTE

Regardless of the instrument type connected to Paintmaker/Datacolor PAINT, this screen will display “Dataflash 100”. Ignore this information.

---

# Replacing White Tile Data

## Overview

If due to damage or loss, you replace the calibration tile for the Datacolor CHECK 110R, you must also replace the white tile data on the Datacolor 110R PDA. Datacolor will provide a replacement tile *and* a new calibration file. You must replace the white tile data on the PDA before calibrating the unit with the new white tile.

### NOTE

The calibration procedure for the Datacolor 110R displays a serial number for the white tile data it is using. This number must match the number on the replacement white tile. When the wrong white tile data is used in the calibration procedure:

\* It is not valid to compare the absolute data measured by two different instruments.

\* It is not valid to compare measurements made by the same unit , before and after the calibration data is changed.

The data replacement procedure includes two steps:

- Importing the white tile data from the removable media using the Datacolor Portables program.
- Transferring the data to the standalone Datacolor 110R. This is done from inside the Datacolor Portables program.

## Before You Begin

These instructions assume the unit has already been properly configured to transfer data between the Datacolor 110R and the desktop PC. This can be doing via wired or wireless transfer.

- For wired transfers, you need to use the Datacolor custom cable. See *Datacolor 110R Data Exchange, Preparing for Data Transfer for additional information.*
- For wireless transfers additional system configuration is required. See *Appendix, Wireless Data Transfer Configuration for instructions.*

You will need the replacement white tile data. It is provided by Datacolor on both a diskette and a CD.

## Import Procedure

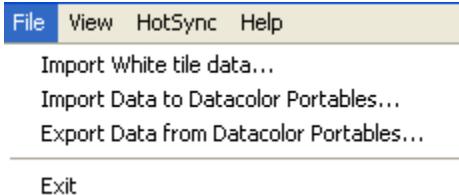
1. Launch the Datacolor Portables Desktop program, and select the correct instrument.



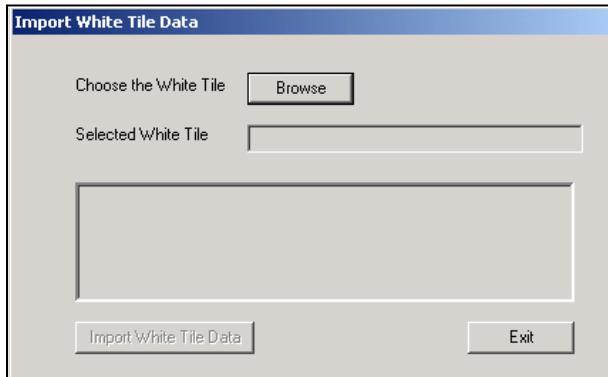
### NOTE

The user selected must match the instrument receiving the new white tile data. If it does not, the data will not be transferred to the correct instrument.

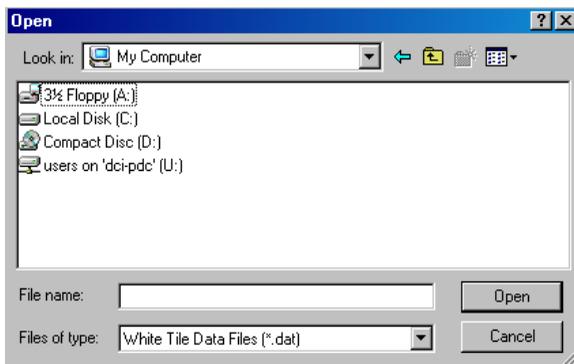
2. Insert the diskette/CD containing the white tile data into the drive.
3. From the menu bar, select **File, Import White Tile Data**.



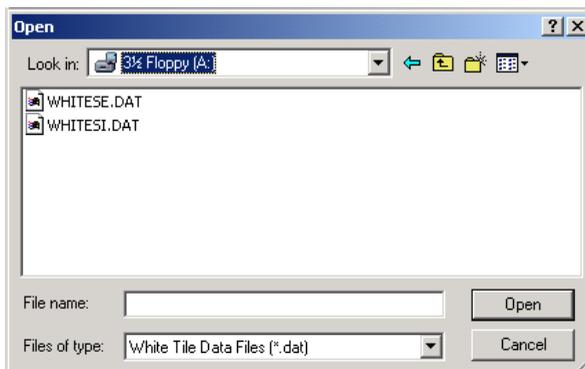
The screen below displays, prompting for the location of the white tile data:



- Click **Browse**. The Open dialog box displays.



- Browse to the drive/folder location for the calibration data, and click **Open**. The window refreshes, and the files are displayed.



- You must import both files.

#### NOTE

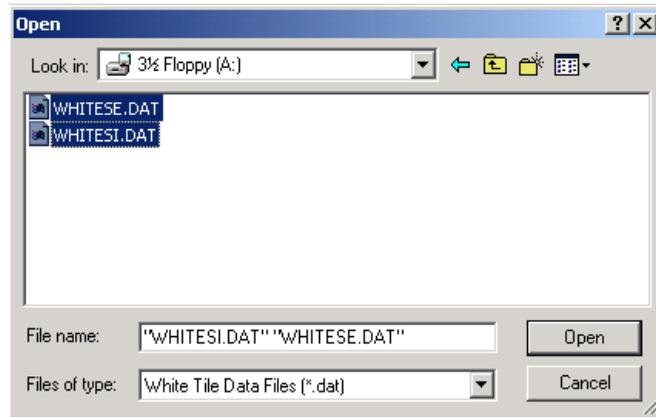
If both files are not transferred, when you try to calibrate the stand-alone unit you will receive the following error message:



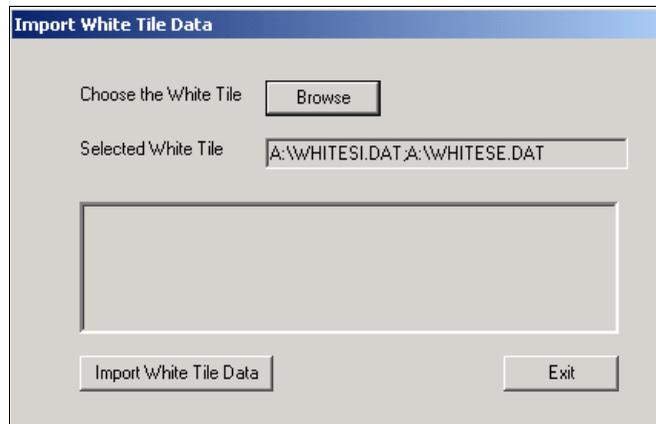
Tapping **OK** will enabled you to complete the calibration without using the correct data. The calibration will not be accurate.

To select both files, do the following:

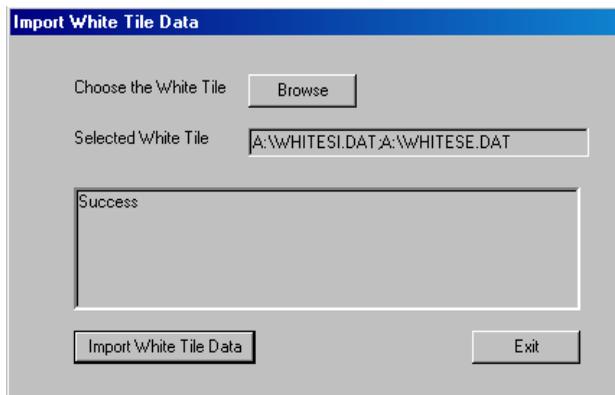
- Click to highlight one of the white tile files.
- When the file is highlighted, press the **CTRL** key.
- With the CTRL key depressed, click the 2nd white tile file.
- Release the **CTRL** key. Both files will be highlighted.



7. Click **Open**. The Import White Tile Data dialog displays.



- Click **Import White Tile Data**. The message “success” will be displayed.



The new white tile has been imported to the Datacolor 110R database on the desktop PC. To complete the transfer to the Datacolor 110R, you must perform data synchronization. See *Stand-Alone Data Synchronization for instructions to complete the transfer*.

---

## Stand-Alone Data Synchronization

### Overview

The transfer of data between the Datacolor 110R and the desktop PC can be done using two different programs:

- **Datacolor PAINT.** Using Datacolor PAINT, you can transfer measurements from the Datacolor 110R to the Datacolor PAINT database. This transfer is a one-way transfer, from the stand-alone unit to the PC, and is done from inside the Datacolor PAINT program. See *Datacolor 110R Data Exchange, Preparing for Data Transfer for instructions to execute this transfer*.
- **Datacolor Portables.** This is two-way data synchronization, with data sent to and from the Datacolor 110R. You must use this method when replacing white tile data on the Datacolor 110R. It is done using the Datacolor Portables program, and this section documents the procedure.

## NOTE

These instructions assume the following:

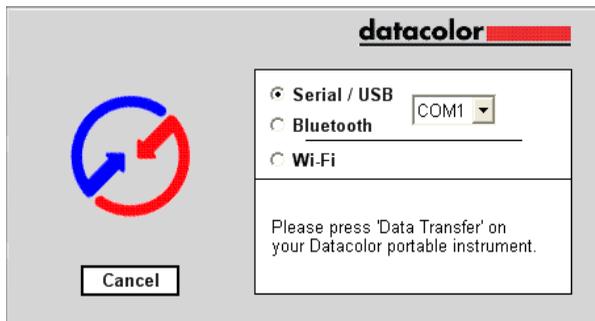
- 1) The Palm Desktop program is installed on the computer.
- 2) You have access to the Datacolor 110R.
- 3) You have successfully imported the white tile data. See *Appendix, Importing White Tile Data for instructions to complete this step.*
- 4) You have already configured the Datacolor 110R for data synchronization, using either a wired or wireless data connection. See *for instructions to configure a wired connection.* See *Appendix, Wireless Data Transfer Configuration for instructions to configure a wireless connection.*

## Data Synchronization Procedure

1. Launch the Datacolor Portables program and, from the toolbar, click on the Sync Wizard button:



The program will prompt you for the type of connection, and the port to be used.

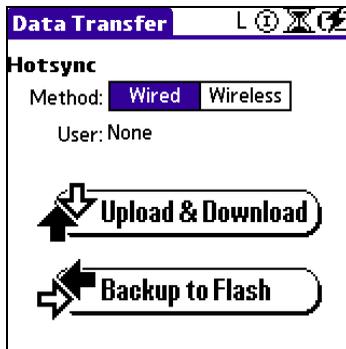


2. Make the appropriate selections.

3. From the main menu on the Datacolor 110R, tap **Data Transfer**.



The Data Transfer screen displays.



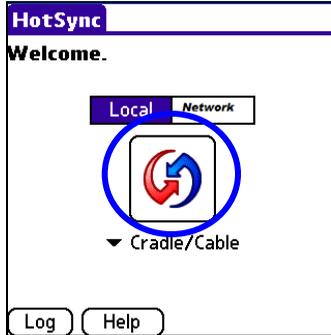
- Select the type of connection, *Wired* or *Wireless*, you are making.

**NOTE**

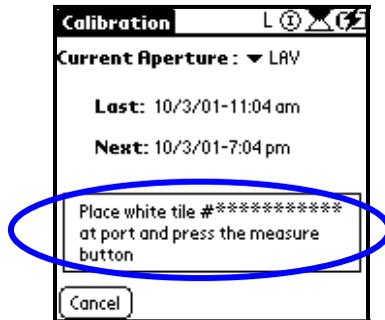
Wireless connections require some additional program configurations on both the desktop PC and the wireless device. See Appendix, *Wireless Transfer Configurations* for details.

4. Tap **Upload & Download**.
  - For *Wired* connections, the synchronization begins immediately.

- For *Wireless* connections, the HotSync screen displays.



- *Local*. This is the connection type for Bluetooth users.
  - *Network*. This is connection type for WIFI users.
5. When you have made this selection, tap the **HotSync icon**. The data transfer will begin.
  6. When it is completed, click **Finish**. When you calibrate the Datacolor 110R, the program will display a serial number for the tile:

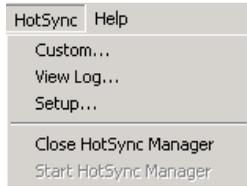


This number should match the number on the *replacement* tile you are using.

---

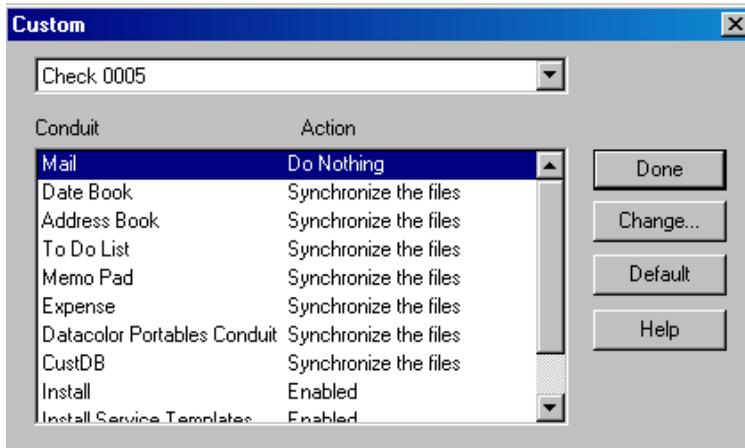
## HotSync Manager Settings

This section documents the settings required to allow the *Datacolor 110R* to work with the Palm® Desktop program. These settings can be accessed from the *Datacolor Portables Desktop (Hot Sync Menu/Custom and View Log options)*.

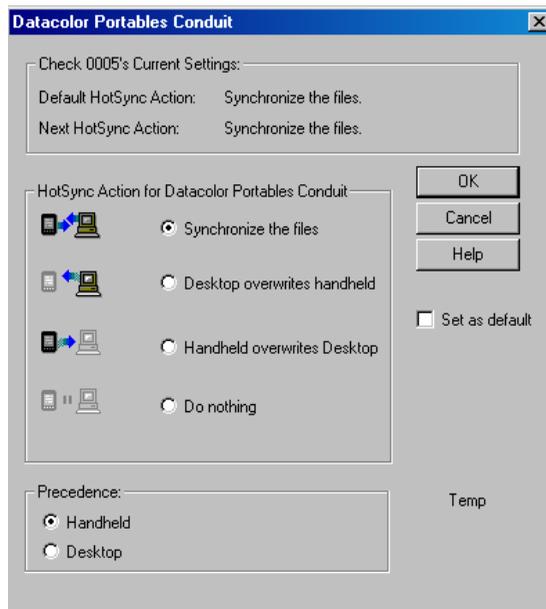


### Custom

This option customizes the data transfer settings for each program on the PDA. You will be working with the option *Datacolor Portables Conduit*.



1. In the Custom dialog box, highlight **Datacolor Portables Conduit**, and click the **Change...** button. The Datacolor Portables Conduit dialog box displays.



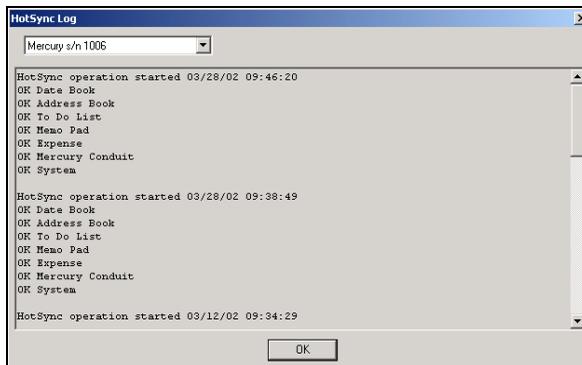
2. Click the radio button that corresponds to the setup to be used.

OPTION	DESCRIPTION
<b>Synchronize the files</b>	The Datacolor 110R data on the computer and the PDA will be synchronized. When the process is completed, the data on both devices will be expanded to incorporate all of the data found on each device. <b><u><i>This is the default setting for the Datacolor Portables program data transfer.</i></u></b>
<b>Desktop overwrites handheld</b>	During the synchronization process, changes made to the Datacolor 110R data on the computer will overwrite changes made to the data the PDA.
<b>Handheld Overwrites Desktop</b>	During the synchronization process, changes made to the Datacolor 110R data on the PDA will overwrite changes made to the data the computer.

OPTION	DESCRIPTION
<b>Do Nothing</b>	Datacolor 110R data will not be updated during the synchronization.
<b>Precedence</b>	<p>When the same record has been edited in the Datacolor 110R database and the Datacolor 110R PDA, the system must know which edited record is correct.</p> <ul style="list-style-type: none"> <li>• <b>Handheld.</b> The changes made to the Datacolor 110R PDA will be stored in both locations.</li> <li>• <b>Desktop.</b> The changes made the computer will be stored in both locations.</li> </ul>
<b>Set as default</b>	Place a check in this box to make the current selection for Datacolor Portables conduit the default selection.

## View Log

Each time data is transferred, notes are added to the log regarding the outcome of the synchronization. This records information regarding the synchronization process, including problems that occurred.

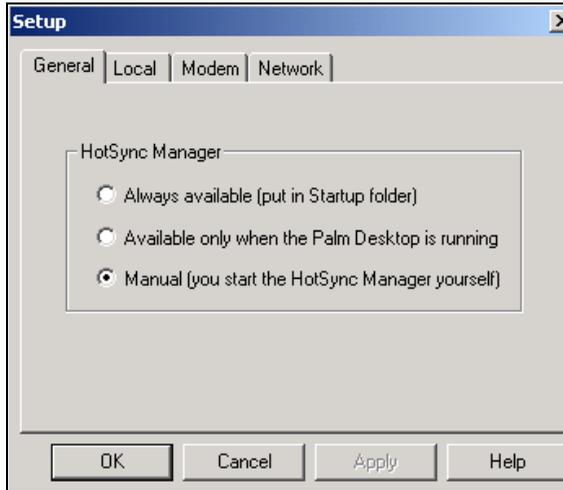


### NOTE

A log is kept for each conduit the system.

## Setup

This option controls the configuration of the hardware and software for data transfer.



**General Tab.** This group of options controls whether the Hot Sync Manager is opened automatically.

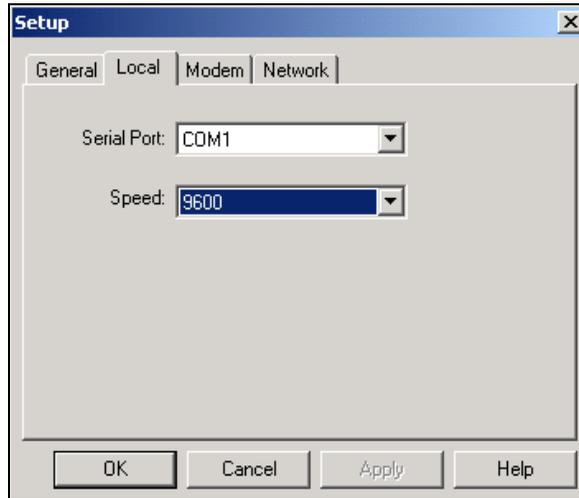
- **Always available (put in Startup folder).** Whenever you start your computer, the Hot Sync Manager is automatically started as part of the Startup procedure.
- **Available only when the Palm Desktop is running.** The Hot Sync Manager is automatically opened when the Palm Desktop application is running. This results in the instrument port being reserved for data synchronization whenever the Palm Desktop is running.

### NOTE

When you are running Paintmaker/Datacolor PAINT, or other Datacolor applications, you will not be able to use the instrument to measure samples when the HotSync Manager is open, even if a data transfer is not in progress.

- **Manual (you start the HotSync Manager yourself).** The user is required to open the HotSync Manager to perform data synchronization. When the HotSync Manager is not open, the port is available for other uses. **This is the default selection for the Datacolor 110R/Paintmaker/Datacolor PAINT data transfer.**

**Local Tab.** This tab identifies the port to be used for the synchronization, and the speed at which the data will be transferred.



- **Serial Port.** This identifies the communications port used by the Datacolor 110R, regardless of whether you are using a serial or USB port. Click the down arrow to view the list of ports on your computer, and select the correct port.
- **Baud Rate.** Baud rate refers to the speed at which the data will transfer between the Datacolor 110R and the desktop computer. For the Datacolor 110R data synchronization, **the baud rate must be set to 9600**. Click the drop-down list arrow to view the baud rate choices, and select **9600**.

**Modem Tab.** For the Datacolor 110R, no changes are made to these defaults. They control advanced synchronization features offered by the Palm Hot Sync Manager. *Refer to the Palm software documentation for further information.*

**Network.** For the Datacolor 110R, no changes are made to these defaults. They control advanced synchronization features offered by the Palm Hot Sync Manager. *Refer to the Palm documentation for further information.*

## ***Close HotSync Manager***

If the HotSync Manager is opened manually, this option allows you to close it. *Not applicable to Datacolor 110R users.*

## ***Start HotSync Manager***

Not applicable for Datacolor 110R.

---

## Instrument Calibration Supplemental Information

ITEM	DESCRIPTION
<b>What happens when the instrument is calibrated?</b>	<p>The measurements made by the spectrophotometer can be affected by changes in its environment including temperature, humidity, dust, etc. When an instrument is calibrated regularly, the measurements from that instrument remain consistent over time.</p> <p>During the calibration procedure, the system compares the current measurement of the white tile, to a measurement of the same tile made before the instrument left the factory. From this comparison, it calculates factors that account for changes in the performance of the instrument. These factors are applied to new measurements to adjust for any changes to the instrument that affect the measurement.</p> <p>Performing an instrument calibration allows you to compare measurements of the same sample made at different times. It also enables you to compare measurements of the same sample made by different instruments.</p>
<b>What is a 'black trap' and why do I have to measure it?</b>	<p>A black trap is a small cylinder or rectangular box that is completely black on the inside. When it is placed over the instrument port properly, no light escapes from it. Ideally, when the black trap is measured, no light is reflected back from it and no light escapes from its edges. In theory, no sample will have a lower reflectance than the black trap. This sets the lower limit for every measurement and takes into account the electrical noise of the instrument.</p>
<b>Why do I measure a white tile?</b>	<p>The white tile measurement performs two functions. First, it accounts for any changes in the condition of the instrument. The tile itself is made from a highly durable material that is not sensitive to light or heat, and is resistant to environmental forces that may otherwise cause the surface to break down over time. This tile produces the highest (non-fluorescent) reflectance value you will measure across the visible spectrum, and sets the upper measurement limit for the instrument.</p> <p>Each time you calibrate, the system compares the original measurement of the white tile, stored during factory calibration, to the current measurement. It</p>

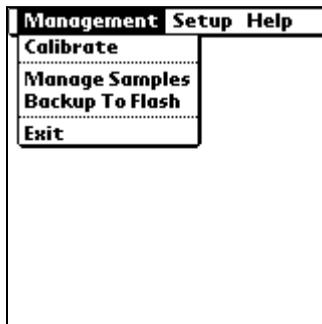
ITEM	DESCRIPTION
	<p>calculates and stores a set of factors that, when applied to the current measurement, make the current measurement equal to the original measurement of the white tile. The result is that today's measurement of the white tile is the same as a measurement made before the instrument left the factory floor. These factors are then applied to each measurement you make, to adjust for changes in the instrument's performance.</p> <p>The white tile is also the link between your instrument and a master white standard used internationally. This link is established in the procedure used to calibrate the instrument at the factory, and allows you to compare your measurements to those made by other instruments around the world.</p>
<p><b>How often must I calibrate the instrument?</b></p>	<p>We recommend that the instrument be calibrated every 8 hours.</p>

## Illuminant/Observer Supplemental Information

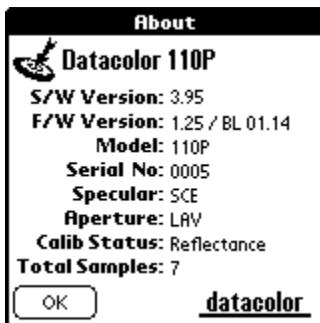
### *ASTM Table 5 vs. Table 6 Data*

The programs use the Illuminant/Observer tables published by the ASTM. Periodically this data is updated by ASTM. Table 6 data is the default data used by the Datacolor 110R software. However, Table 5 data is also available for use with Datacolor 110R. To switch the Illuminant/Observer data:

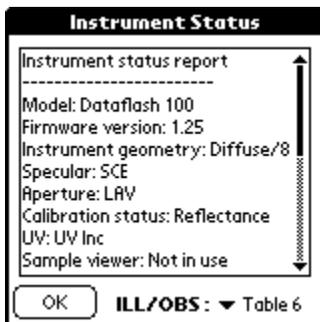
1. Tap on **Management Options, Help.**



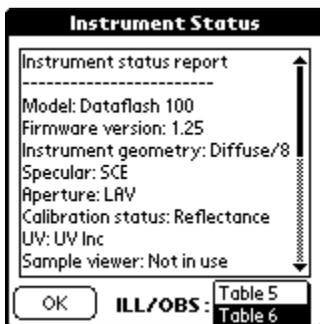
2. Tap on **Help/About**. The About screen displays.



3. Tap on **datacolor**. The screen below appears:



4. Tap on the **down arrow** (▼) to display the Illuminant/Observer table selections.



5. Tap on the table selection to be used. The program will be updated immediately.

---

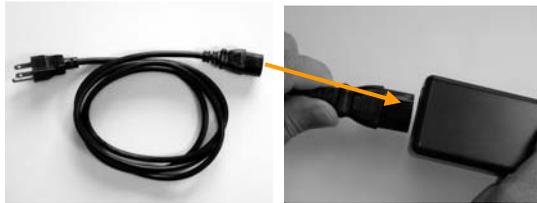
## Optional Accessories

Two optional accessories are available for the Datacolor 110R, a stand-alone battery charger, and an automotive adapter.

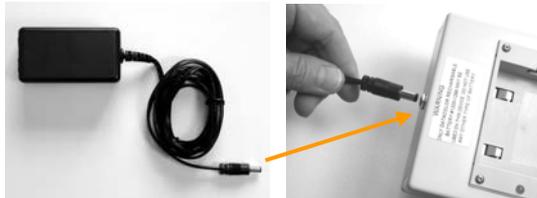
### ***Stand-Alone Battery Charger***

The stand-alone battery charger has the capacity to charge two Datacolor 110R batteries. If you are making a high volume of measurements using the Datacolor 110R, this allows you to have a fully charged battery on-hand at all times.

#### ***Connecting Power Cord to Power Adapter***



#### ***Connecting Power Adapter to Battery Charger***



#### ***Multiple Battery Charger***



## ***Automotive Adapter***

Another accessory is an adapter that allows you to charge the Datacolor 110R battery using the lighter outlet in the car. The battery in the Datacolor 110R can be recharged directly, or you can connect a stand-alone battery charger to the outlet.



### ***Automotive Adapter Connected to Datacolor 110R Unit***



### ***Automotive Adapter with Stand-Alone Battery Charger***

## Accessory Specifications

	Stand-Alone Battery Charger	Automotive Adapter
<b>Datacolor Part #</b>	1200-1364	1200-1367
<b>Description</b>	Dual battery charger for Portable Battery Pack Part No. 1200-1299	12 Volt DC automotive adapter for Datacolor portable spectrophotometer product family ( <b>Datacolor Check, Datacolor Check PLUS, Datacolor CHECK PRO, Datacolor 110 P</b> ) and also for Portables battery charger, part no. 1200-1364
<b>Output Power Requirements</b>	4.1v DC 0.500 Amperes 2 Watts Maximum <i>Used only to charge Portable Battery Pack Part No. 1200-1299</i>	6.5 Volts DC 1.8 Amperes 10 watts, maximum via the 8-pin MINI-DIN connector
<b>Input Power Requirements</b>	6.5V DC 1.5 Amperes 10 Watt maximum <i>Use only approved power source containing an approved disconnect device that is within easy reach of operator's position. Power Adapter Part No. 4050-0065 or Datacolor Portable Automobile Adapter Part No. 1200-1367</i>	10 –15 Volts DC 1.8 Amperes 18 Watts maximum via the automotive adapter connector
<b>Operating Environment</b>	5°C to 40°C Maximum relative humidity is 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C, altitude up to 2000 meters	5°C to 40°C Maximum relative humidity is 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C, altitude up to 2000 meters
<b>Battery Recharge Time</b>	4 hours	N/A
<b>Fuse</b>	This product contains a 1.5 ampere, 15 Volt DC non-replaceable fuse	This product contains a 3AG, 5 Ampere replaceable fuse in the automotive adapter connector
<b>Case Size</b>	188mm x 112mm x 40mm 7.4 in x 4.4 in x 1.6 in.	60mm x 35mm x 21mm 2.4 in x 1.4 in x 0.8 in
<b>Miscellaneous</b>	This product to be used only in the manner specified by the manufacturer. There are no operator-replaceable parts. Remove all power before servicing.	This product to be used only in the manner specified by the manufacturer. There are no operator-replaceable parts. Remove all power before servicing

---

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CIE Technical Report: Improvement to Industrial Colour-Difference Evaluation. CIE Pub No 142-2001. Vienna: Central Bureau of the CIE; 2001.

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