

spectra™

Fluorescence Caries Detection Aid System

Part Number D4000

Operator's Manual



**AIR
TECHNIQUES**
INC.

ISO
9001
ISO 13485
FDA-GMP COMPLIANT

FOREWORD

Air Techniques has prepared this document as a guide to the proper use of the Spectra Fluorescence Caries Detection Aid System.

Review and follow the guidelines included in this Operator's Manual to ensure that your Spectra System gives you the highest level of service.

For product support and information on how to expand your Spectra System, contact your authorized Air Techniques dealer; call our Technical Support at 1-800-AIR-TECH (1-800-247-8324) or visit the following web site.

- Air Techniques web site, **www.airtechniques.com**

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This equipment has been designed to minimize exposure of personnel to hazards. While the Spectra System is designed for safe operation, certain precautions must be observed. Use of the Spectra System not in conformance with the instructions specified in this manual may result in permanent failure of the unit.

Users must exercise every precaution to ensure personnel safety. They must be familiar with the warnings and cautions presented throughout this manual and summarized below.

Warnings.

- Due to light emitting diodes (LED) intensity and wavelength, users and patients should not look directly into the blue-violet light from the Spectra Handpiece.
- To prevent fire or electrical shock, do not expose this device to rain or moisture.

Cautions.

- Federal law restricts this device to sale by or on the order of a dentist or licensed practitioner. This device should be used only under the continued supervision of a dentist or licensed practitioner.
- There are no user-serviceable parts inside. Servicing should be performed by qualified dealer service representatives only.
- Connecting any device to the Spectra System that does not meet the equivalent safety requirements of the system may reduce the safety effectiveness of the Spectra System.
- Unplug the system components from the USB port before performing cleaning procedures.
- Do not wipe the surfaces using benzine, thinner, etc. as this may degrade the finish.
- Do not spray cleaning liquids or disinfectant directly on the Spectra Handpiece or the Spectra Handpiece Cable. Use care not to allow liquids to run into internal circuitry.

Contraindications.

- None known.

Use of Accessory Equipment.

All peripheral equipment (computers, monitors, printers, etc) connected to this equipment must comply with IEC 60601-1 and the resulting system must comply with IEC 60601-1 and/or IEC 60601-1-1 harmonized national standards when set-up within the immediate patient vicinity (ie. within 6 feet).

Accessory equipment outside the patient vicinity must comply with IEC 60601-1 or IEC 60950-1 as allowed by IEC 60601-1-1.

Use of ACCESSORIES or cables other than those specified or provided by Air Techniques may result in increased EMISSIONS or decreased IMMUNITY of the equipment.

Do Not Attempt Internal Service.

The interior of each component of the Spectra System is only accessible by removing hardware with tools and should only be opened and serviced by an authorized service technician.

Contact your local Air Techniques authorized dealer for service. Failure to heed this directive may result in equipment damage and voiding the warranty.

GENERAL SAFETY

Markings.

The following terms or symbols are used on the equipment or in this manual to denote information of special importance:



Alerts users to important Operating and Maintenance instructions. Read included documents.



Indicates type BF equipment in accordance with UL/IEC 60601-1



Alerts users that the camera cover must be used for only one patient and disposed of properly in accordance with local code.



Medical Electrical Equipment
with respect to electrical shock, fire, mechanical and other specified hazards only in accordance with
UL-60601-1, CAN/CSA C22.2 No.601.1
66CA



Identifies the name of the manufacturer.



Indicates date of manufacture



Indicates that the Spectra complies with the Medical Device Directive 93/42/EEC.



Medical Device Safety Service
Schiffgraben 41
30175 Hannover, Germany

Manufacturer:

Air Techniques, Inc.
1295 Walt Whitman Road
Melville, New York 11747 USA

CONGRATULATIONS

Congratulations on your purchase of the Spectra Fluorescence Caries Detection Aid System, the latest product from Air Techniques for aiding in the detection of caries. The Spectra Fluorescence Caries Detection Aid System is hereafter referred to as the Spectra System in this manual.

The Spectra System, which consists of a toothbrush-sized, fluorescence-based handpiece for capturing images and imaging software for displaying images, is ideal for aiding in the detection of caries as practiced in today's modern dental operatories. The Spectra system provides the following benefits:

- Motivates the patient to carry out a professional tooth cleaning.
- Aids in the detection of caries.
- Allows images to be saved so that patient oral hygiene may be tracked over time.
- Ideal complement to an X-ray imaging system for patient care.

The light-weight, one-piece, maneuverable Spectra handpiece has a quick disconnect feature allowing it to be quickly detached and easily carried between patient operatories for use with other Spectra System components.

This manual covers the installation, operation and maintenance of:

Spectra Fluorescence Caries Detection Aid System.P/N D4000

FUNCTIONAL DESCRIPTION

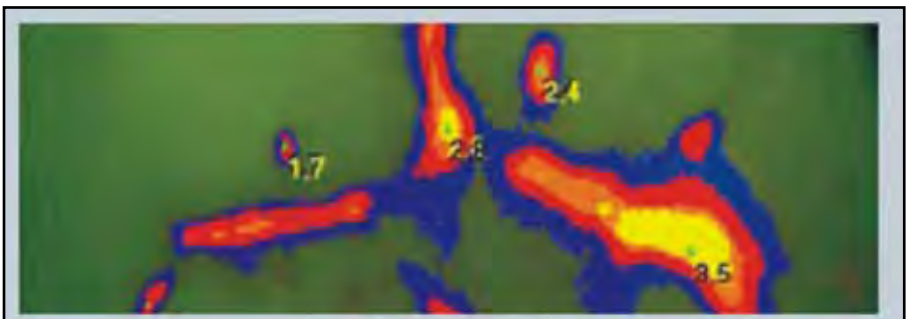
The Spectra handpiece and imaging software are used as an aid in the detection of caries after professional oral cleaning.

The light emitting diode (LED) lamps in the Spectra handpiece emit blue-violet light with a 405nm wavelength which causes sound dental enamel to fluoresce with a green color and areas containing metabolic by-products (porphyrins) from caries producing bacteria to fluoresce with red color. The optics and the charged coupled device (CCD) sensor in the Spectra handpiece picks up the images containing this fluorescence and converts them to an electrical signal that is sent to the user's computer via the USB cable. The imaging software running on the user's computer is used to analyze and display these images.

The imaging software provides two modes of operation – detection mode and analysis mode. Detection mode is used to view the fluorescence of the occlusal tooth surfaces in order to quickly identify areas for the dentist to examine using Gold Standard methods. Areas containing potential caries will show red coloring whereas sound enamel will have green coloring.

Analysis mode is used to aid in the detection of caries. This is done by making a live inspection of the mouth after the teeth have been cleaned and dried, and then freezing the image in an area of interest for the dental practitioner to evaluate by Gold Standard methods. The imaging software highlights the potential areas of carious lesions found in the frozen image by displaying colors other than green and numbers as shown in the figure below. As an aid in the detection of caries, any color other than green or any number displayed in the image should direct the dental professional to examine that area using Gold Standard techniques. The Spectra image information together with results of visual Gold Standard examination and X-ray image inspections can be used to identify any caries and to formulate an appropriate treatment plan.

Important: Spectra colors and numbers should not be used to solely determine treatment. The results should be used together with other information obtained by various Gold Standard diagnostic techniques to arrive at an overall treatment assessment.



Displayed Color	Green → Blue → Red → Orange → Yellow
Displayed Number	1.0 → → → → → >3.0
Examine for	Healthy Tooth → Use Gold Standard techniques to examine for potential caries.

Typical Colors and Numbers In Frozen Analysis Mode Images

IMPORTANT INFORMATION

General Notes.

- The Spectra System may only be operated using authorized software.
- The Spectra System is an aid in the detection of caries by providing additional information to supplement the dentist's visual observations, patient history, and information from other diagnostic techniques, resulting in an overall treatment determination. The Spectra System does not provide a diagnosis. Diagnosis subsequent to the use of the Spectra is performed and provided by the dental practitioner.
- Always perform a professional cleaning using a prophy brush, powder jet cleaner or other acceptable means to remove any debris, meal deposits, dental tartar, plaque detection agents and preventative materials such as fluor-paste that can interfere with caries detection.
- All instructions in this manual form an integral part of the unit. They must be kept close to the unit and in readiness whenever required. Precise observance of these instructions is a pre-condition for use of the unit for the intended purpose and for its correct operation. This manual should be passed on to any future purchaser or operator.
- Safety of the operator as well as trouble-free operation of the unit are only ensured if use is made of original equipment parts. Moreover, use may only be made of those accessories that are specified in the technical documentation or that have been expressly approved and released by the manufacturer for the intended purpose. The manufacturer cannot warranty for the safety or proper functioning of this unit in the case where parts or accessories are used that are not supplied by the manufacturer.
- There is no guarantee against damage arising where parts or accessories are used that are not supplied by the manufacturer.
- Observe the usage and storage conditions.
- The manufacturer regard themselves as being responsible for the equipment with regard to safety, reliability and proper functioning only if assembly, changes or modifications and repairs have been carried out by an authorized dealer and if the equipment is used in conformity with the instructions contained in this manual.
- The device conforms to the relevant safety standards valid at this time.
- Any reprinting of the technical documentation, in whole or in part, is subject to prior written approval by the manufacturer.

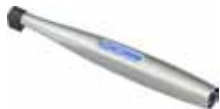





Incorrect Usage.

- Any use that is not described in this manual as correct usage is considered as incorrect usage. The manufacturer is not to be held liable for any damage caused as a result of incorrect usage. The operator bears all risks.

KEY PARTS IDENTIFICATION

The Spectra System consists of a Spectra Handpiece, a Spectra Handpiece Cable and associated accessories. The handpiece, cable, accessories and software may be purchased together under part number D4000. Some of the items may be purchased individually by the part numbers listed below or as listed on page 20.

Spectra System, Part Number D4000, includes:

Item	Qty	
Spectra Handpiece Replacement Part Number D4060	1	
Disposable Camera Covers Sample Pack for Spectra Handpiece	50	
10mm Distance Spacers Sample Pack for Spectra Handpiece	10	
Spectra Handpiece Cable, 10 feet Part Number D4020	1	
Handpiece Holder with Chairside Adapter Replacement Part Number D4170	1	
Quick Start Instructions Part Number D4043	1	
CD, Part Number D4151, containing - PDF version of Operator's Manual USB Device Drivers Demonstration Program and Utilities Adobe Acrobat Reader	1	

COMPONENT DESCRIPTION

The components of the Spectra System are described below.

Spectra Handpiece - The Spectra Handpiece is lightweight with a high resolution, high sensitivity, auto-exposure controlled CCD sensor, a high performance lens system and special LED lamps that emit blue-violet light at a 405nm wavelength which causes metabolic products (porphyrins) from caries producing bacteria to fluoresce. When used with the supplied 10mm distance spacer, the fixed focus lens brings all objects within the area of interest in focus enabling it to aid in the identification of potential carious lesions. The Spectra Handpiece has the rich look and tactile feel of a professional handpiece and provides 2 keypad buttons for fingertip operating control of the system.

Camera Covers Sample Pack - Provides a quantity of 50 disposable camera covers used as an effective barrier preventing any hazard to the patient.

10mm Distance Spacer Sample Pack - Provides a quantity of 10 spacers for use with the Spectra Handpiece. Each spacer helps to block out stray light and to maintain an appropriate steady distance between the lens tip and the tooth surface to be examined. Although the spacers are reusable, each must be sterilized before use (see page 15).

Spectra Handpiece Cable - A 10 foot cable that is used to connect the Spectra handpiece to the user's computer. One end of the cable has a keyed, 5-pin quick disconnect connector for connection to the Spectra handpiece and the other end has a Type A USB connector for connection to a USB port on the user's computer. This cable carries all power, video and keypad button control signals for the handpiece.

Spectra Handpiece Holder - The Spectra Handpiece Holder can be fastened in a convenient location for safe storage of the handpiece when it is not in use. In addition to storage, the handpiece holder also has a built-in magnet that turns off the Spectra Handpiece power. This feature conserves energy and equipment wear, allowing the system to be ready and operational when needed.

Compact Disk - A compact disk (CD) included with the Astra System that includes:

1. USB Device Drivers, Demonstration Program and Utilities
2. PDF version of Operator's Manual
3. Adobe Acrobat Reader

UNPACKING AND INSPECTION

Unpack each component of the Spectra System and inspect for physical damage such as scratches, damaged connectors, etc. If any damage is noted, immediately notify your Air Techniques authorized dealer immediately so corrective action can be taken.

Make sure to save all packaging material in case repackaging and shipment is necessary.

Verify that all listed items were received. If any item is missing, notify your Air Techniques authorized dealer.

PRE-INSTALLATION INFORMATION

Important: The Spectra System must be connected to a USB port on a computer system that is loaded with Air Techniques authorized third-party Imaging Software, such as VISIX, or TWAIN compliant software, in order to operate the Spectra System.

Minimum Computer System Requirements - The Computer System (laptop or computer, monitor, etc.) and any related peripheral or other equipment, supplied by the user, or a third party, must comply with IEC 60601-1 and the resulting system must comply with IEC 60601-1 and/or IEC 60601-1-1 harmonized national standards when set-up within the immediate patient vicinity (ie. within 6 feet). Accessory equipment outside the patient vicinity must comply with IEC 60601-1 or IEC 60950-1 as allowed by IEC 60601-1-1. Unless otherwise stated, the components of the computer system must comply with the minimum requirements listed below.

- CPU Speed: Pentium-4, 2 GHz or higher
- Operating System: Microsoft Windows XP Professional with Service Pack 3 or later for an Intel 32-bit processor;
Microsoft Windows XP Professional 64-bit Edition with Service Pack 2 or later for an Intel 64-bit extended (x64) processor;
Microsoft Windows Vista Business, Enterprise, or Ultimate with Service Pack 1 or later for an Intel 32-bit or an Intel 64-bit extended (x64) processor; or
Microsoft Windows 7 Professional, Enterprise, or Ultimate for an Intel 32-bit or an Intel 64-bit extended (x64) processor.
- Application Software: Authorized third-party Imaging Software, such as VISIX, or TWAIN compliant software.
- System RAM: 256 MB
- CD ROM Drive: 24X or higher
- Monitor : SVGA 17" with 800 x 600 resolution or higher
- Video Display Adapter: 16 MB video card with 800 x 600 pixel resolution and 32-bit color
- USB Port: Must be USB 2.0 high speed, high power port

System Properties.

If unsure of the operating system version installed, check that it meets the necessary requirements by checking the **System Properties** window.

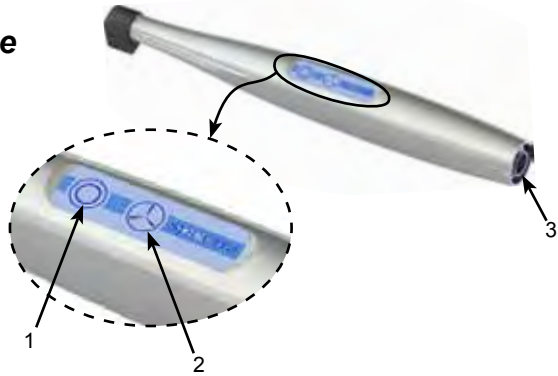
This is done simply by right clicking the **My Computer icon**. Selecting **Properties** from the menu list displays the **System Properties** window as shown. The installed operating system version is listed under the **General Tab**.

The **System Properties** window can also be displayed from the Desktop **Start** button. Just press the **Start** button and select **Settings**→**Control Panel** and then **System**.



HANDPIECE KEYPAD BUTTON FUNCTIONS

Spectra Handpiece



Keypad Buttons - Each keypad button provides the Spectra Handpiece fingertip control over the PC imaging software via the Spectra Handpiece Cable.

- (1) Top Keypad Button: Momentarily press and release this button to toggle between live and frozen images. While operating the system in analysis mode, the imaging software will highlight the areas of the tooth with potential carious lesions on the frozen image.

- (2) Bottom Keypad Button: Momentarily press and release this button to save a frozen image and to return to a live image. Press and hold this button for at least 3 seconds to toggle the system between detection and analysis modes.

- (3) Handpiece Connector: A 5-pin connector socket that accepts connection of the keyed 5-pin quick disconnect plug end of the Spectra Handpiece Cable.

Installing the Spectra System is as simple as making the necessary connections of the Spectra Handpiece Cable between a PC and the Spectra Handpiece. An Air Techniques authorized imaging software application such as VISIX must also be installed on the PC to allow operation of the Spectra System. Perform the following procedures to set up the Spectra System.

Notes: Air Techniques authorized third-party Imaging Software, such as VISIX, or TWAIN compliant software, must be installed on the computer in order to operate the Spectra System.

A Microsoft® **Driver Not Signed** statement may appear. If it does, click **Continue** to proceed with installation.

USB Device Driver Installation - Before connecting the Spectra System to your computer or attempting to use it for the first time, run the Setup program on the Spectra System Drivers and Utilities Disk included with the Spectra System. The supplied CD provides the device drivers needed to communicate between the Spectra System and the associated USB imaging software application installed on the PC computer system. Normally, this program runs automatically when the CD is inserted into the drive for the first time. If not, run the setup program located in the root directory of the CD (typically **D:\Spectra.exe**).

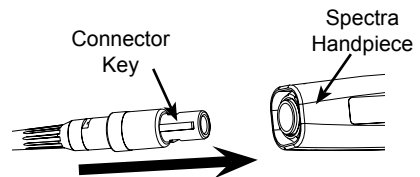
The Setup program guides the user through updating the computer library files, which must be completed before the Spectra System will operate properly. More information can be found in the Installation Instructions and Notes file on the Spectra System Drivers and Utilities Disk included with the system.

CAUTION: DO NOT twist or turn the cable connectors. The Spectra Handpiece Cable connector is keyed and mates straight on with the Handpiece connector.

Important: DO NOT rapidly connect and disconnect the handpiece to/from the Spectra Handpiece Cable. Rapid connecting and disconnecting causes Windows to lock out the Spectra for 30 to 60 seconds and inhibit operation.

Spectra Handpiece Connection - Carefully connect the Spectra Handpiece to the supplied Spectra Handpiece Cable as follows:

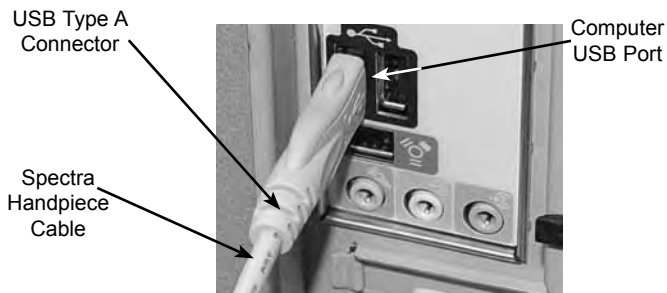
1. Using the gray molded connector end of the Spectra Handpiece Cable, align the connector key with the keyway of the handpiece connector.
2. Insert straight into the handpiece connector until it securely snaps into place.



Spectra Handpiece Connection

USB Interface Connection - Connect the USB Type A connector side of the Spectra Handpiece Cable to any available USB 2.0 High Speed, high power port on the user supplied Computer System. Always make sure to **use the same USB port** whenever re-connection of the USB cable is necessary.

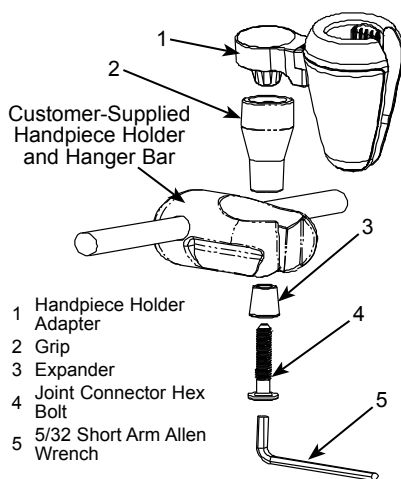
Important: Use a High Power (500 mA) USB Port Only



USB Interface Connection

Spectra Handpiece Holder with Chair-side Adapter - Installing the Chair-side Adapter is as easy as deciding on a location for maximum convenience and securing it to an empty customer-supplied standard Handpiece Holder. Refer to the illustration below and install the Chair-side Adapter as follows:

1. Insert Handpiece Holder Adapter (1) into the wide end of Grip (2).
2. Press Grip (2) into the top of the chosen Handpiece Holder.
3. Insert Expander (3) into the bottom of Grip (2)
4. Insert and push the Joint Connector Hex Bolt (4) into Expander (3) engaging the thread of Handpiece Holder Adapter (1) by turning the Joint Connector Hex Bolt (4) clockwise.
5. Using the supplied Short Arm Allen Wrench (5), tighten Joint Connector Hex Bolt (4) until the Chair-side Adapter is secure in the Handpiece Holder.



Handpiece Holder Chair-side Adapter Assembly

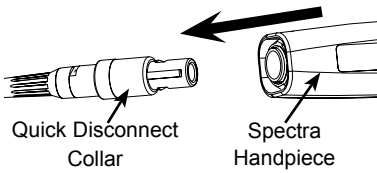
CAUTION: DO NOT twist or turn the cable connectors.
The Spectra Handpiece Cable connector is keyed and mates straight on with the Handpiece connector.

Whether detaching just the Spectra Handpiece from the Spectra Handpiece Cable and using with additional Spectra Handpiece Cable assembly installed on other computers or transporting the complete system (handpiece and cable), the Spectra System is easily shared among patient operatories.

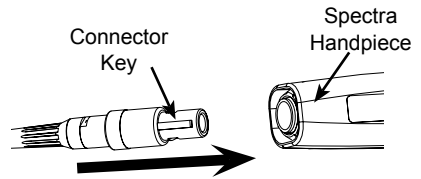
Refer to the corresponding illustrations and perform the following steps when transporting only the Spectra Handpiece.

1. Retract collar of quick disconnect connector and simultaneously pull straight from the Handpiece connector.
2. Release connector quick disconnect collar.
3. Store the Spectra Handpiece Cable by placing the connector into the Handpiece Holder.
4. Transport Handpiece to next operatory.
5. Connect Handpiece at new location by aligning the connector key with the keyway of the mating Spectra Handpiece Cable connector.
6. Insert straight into Handpiece connector until it securely snaps into place.

When transporting the complete Spectra System (handpiece and cable) among patient operatories, simply disconnect the USB connector end of the Spectra Handpiece Cable, transport the system and reconnect to the new computer. Make sure that the computer in the new operatory is using compliant software.

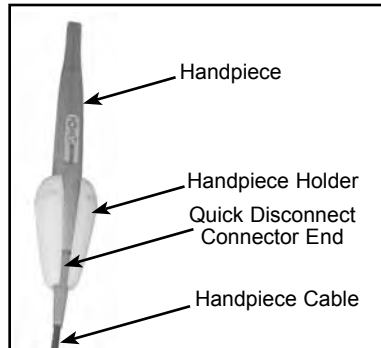


Detaching Spectra Handpiece



Connecting Spectra Handpiece

CAUTION: Always handle the Spectra Handpiece carefully. Do not drop and make sure to protect the optical window from scratches.



Stored with Spectra Handpiece Cable Connected

Preparing For An Examination – Prepare for an examination as follows:

1. Install a new camera cover on the handpiece as shown in the section below.
2. Install the sterilized 10mm distance spacer over the handpiece lens tip as shown in the section below . This spacer helps to block out stray light and to maintain an appropriate steady distance between the lens tip and the tooth surface to be examined.
3. Perform a professional cleaning of the patient's teeth using a prophylaxis brush, powder jet cleaner or other acceptable means to remove any debris, meal deposits, dental tartar, plaque detection agents and preventative materials such as fluor-paste that can interfere with caries detection.
4. Remove any residual polishing paste using an air/water syringe.
5. Dry the teeth completely.

CAUTION: The Spectra System should be used with a camera cover installed over the handpiece. Make sure to use a new disposable cover for each patient.

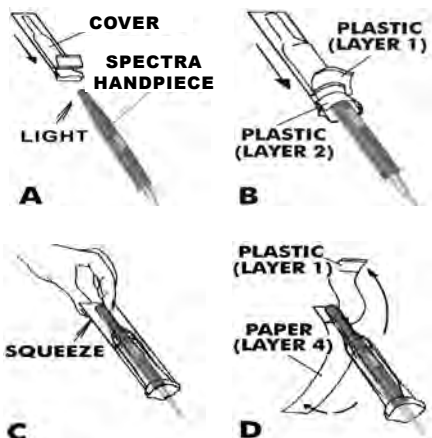


The camera cover must be used for only one patient and disposed of properly in accordance with local code.

NOTE: For optimum image clarity, the optically clear section of the cover must be aligned with the lens by facing the light source section of the handpiece down toward the paper layer.

Disposable Cover Installation - Install a new camera cover on the Spectra Handpiece for each patient as follows:

1. Remove the Spectra Handpiece from the holder.
2. Insert the Spectra Handpiece tip between the second and third layers (between the outer paper and plastic layers) with the LEDs facing towards the paper layer. See A.
3. Push the Spectra Handpiece completely in until the tip is fully inserted into the narrow tip of the cover. See B.
4. Gently squeeze the illuminated tip of the Spectra Handpiece between the thumb and index finger to ensure that the optically clear area of the cover is flat against the lens tip. See C.
5. Peel away and discard the top plastic layer and the bottom paper layer. See D.



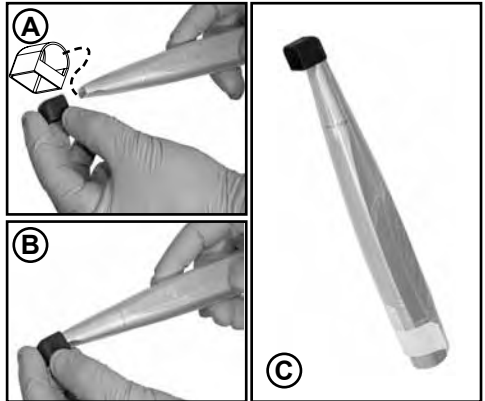
Camera Cover Installation

Important: Make sure that a camera cover is properly installed on the handpiece before installing the 10mm distance spacer.

Note: Steam sterilize the 10mm distance spacer in a gravity steam sterilizer at 121°C for 30 minutes and dry time of 20 minutes before use and handle using gloves. Use a new replacement distance spacer as needed.

10mm Distance Spacer Installation - Install a sterilized 10mm distance spacer on the Spectra Handpiece as follows:

1. Hold the Spectra Handpiece with a camera cover properly installed and insert the handpiece tip into the curved end opening of the 10mm distance spacer. See A.
2. Push the Spectra Handpiece completely in until the tip is fully inserted into the 10mm distance spacer. See B.
3. Make sure that the 10mm distance spacer is properly aligned with the illuminated tip of the Spectra Handpiece. See C.



Distance Spacer Installation

SYSTEM OPERATION

CAUTION: Verify that the software is running and correctly configured. Refer to System Check information provided on page 17 as necessary.

Operating Procedure – After preparing for the intended examination as described above, perform the following steps to operate the Spectra system:

1. Start the imaging software

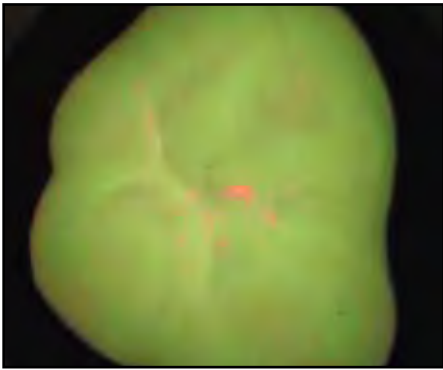
WARNING: Eye Safety- Do not look directly into the blue-violet light from the Spectra Handpiece. Do not view the blue-violet light directly or through magnifying glasses or any other enlargement device.

Important: DO NOT rapidly remove and replace the handpiece from/into it's holder. Rapid removal and replacement from the holder causes Windows to lock out the Spectra for 30 to 60 seconds and inhibit operation.

2. Remove the handpiece from its holder and verify that the blue-violet LED lamps turn on.
3. Place the handpiece lens window over the area of interest. Allow the distance spacer to rest on the occlusal surface of the tooth. Observe the image on the computer monitor screen.

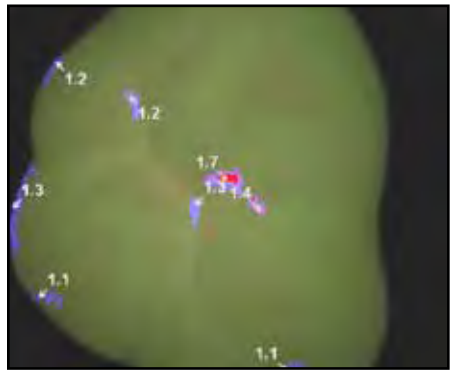
SYSTEM OPERATION

4. Momentarily press and release the top button on the handpiece to freeze the image. View A below shows a typical frozen image in the detection mode. View B below shows a typical frozen image in the analysis mode.
5. Press and hold the bottom button for at least 3 seconds to switch to the desired detection or analysis mode.
6. Perform one of the following steps as necessary.
 - a. Momentarily press and release the bottom button on the handpiece to save the processed image and return back to a live display.
 - b. Press and release the top button momentarily again to return to a live display without saving the image.
7. Repeat steps 3 through 6 as necessary.
8. Return the Spectra handpiece to its holder when done. Verify that the LED lamps on the handpiece turn off.



View A.

Detection Mode Frozen Image Display



View B.

Analysis Mode Frozen Image Display

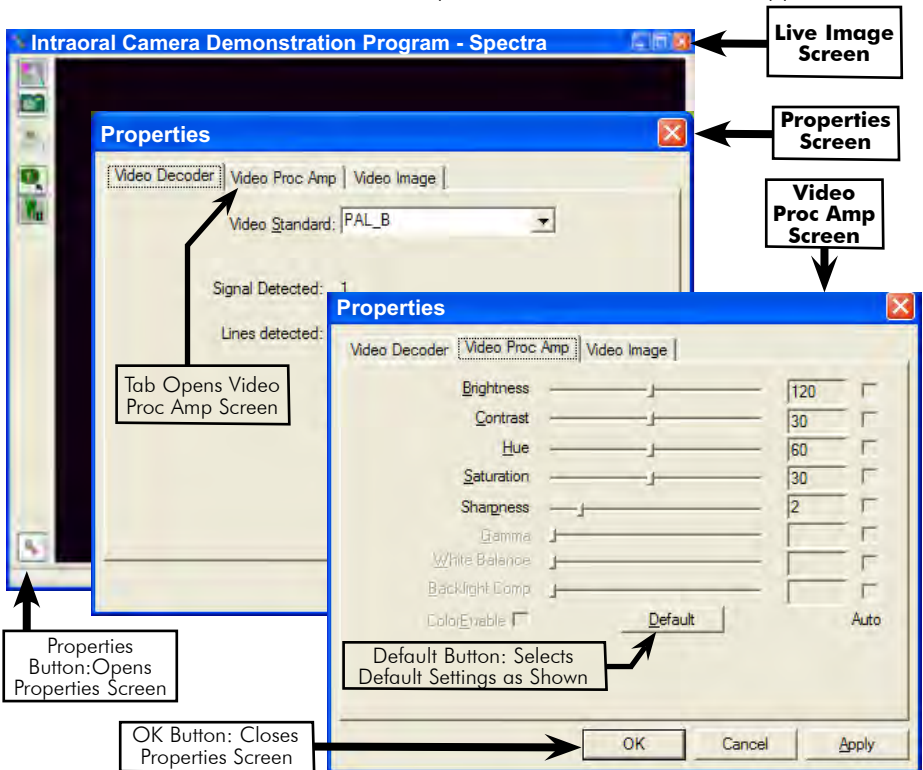
Software-Processed Fluorescence Images

Clinical Operation Guidelines. The user must be aware of the following:

- Very high readings, such as greater than 3.0 (yellow color displayed), may indicate that the teeth are not thoroughly cleaned. Clean, dry and then re-examine.
- False positive caries readings may result from fluorescence occurring from the presence of tartar, food and similar debris lodged in or on the surface of the teeth.
- The Spectra System may also respond to the fluorescent components of some restorative materials such as composite resins, ceramic restorations, sealants and cements. Final assessment is dependent upon an examination of such sites using Gold Standard techniques.
- The colors and numbers displayed by the Spectra System should be utilized only as an aid in the detection of caries. The displayed image should be used as a guide for the dental practitioner to examine the identified area(s) using Gold Standard techniques.

USB Video Diagnostic - If live video is not displayed on the PC monitor of the Spectra System when the imaging software application is running, there could be a problem with the settings in the software application or with the handpiece. Perform the following USB Video Diagnostic procedure to check that the Spectra handpiece is working correctly, the Spectra Handpiece Cable is correctly connected between the Spectra System and the computer and the Spectra System USB driver files are installed correctly on the PC.

1. Go to the **Start** button and select **Programs**.
2. Select the **Spectra** program option and click on **Camera Demonstration** and observe that the Camera Demonstration Program screen opens.
3. Depending on the outcome of the diagnostic, perform one of the following:
 - a. If a live image is correctly displayed, exit from the application and make sure that the imaging software application is configured correctly.
 - b. If a live image is not displayed, exit from the application and check the handpiece, Spectra Handpiece Cable and USB driver file installation.
4. Reset the driver's video settings by performing the following:
 - a. On the Spectra Demostration Program screen, click the **Properties** button located on the lower left of the live image screen.
 - b. On the Properties screen select the **VIDEO PROC AMP** tab and then click the **DEFAULT** button. The image colors should now be correct. Click **OK** to close the Properties screen and exit from application.



INSPECTION AND CLEANING

Perform the following inspection and cleaning procedures periodically as a preventive maintenance measure to keep the Spectra System in optimal condition resulting in trouble-free operation.

WARNING: Do not attempt any internal service of Spectra System components. Contact your local authorized Air Techniques dealer for service. Failure to heed this warning may result in equipment damage and voiding the warranty.

Inspection - Routinely inspect each component of the Spectra System for possible defects as follows:

1. Spectra Handpiece -
 - a. Check overall handpiece for chips, cracks or other irregularities.
 - b. Check the lens window for debris or spots.
 - c. Check the connector socket for damage.
2. Cables and Connectors -
 - a. Check cables for damaged or deteriorated insulation kinking or twisting.
 - b. Check connectors for loose, bent or missing pins.
 - c. Check that the quick-disconnect plug end snaps close to snugly secure the Spectra Handpiece connector.

CAUTION: Do not spray cleaning liquids or disinfectant directly on the Spectra Handpiece. Use care not to allow liquids to run into internal circuitry.

Do not wipe the surfaces using benzine, thinner, etc. as this may degrade the finish.

Do not autoclave the Spectra Handpiece or the Spectra Handpiece Cable.

Unplug the Spectra System components before performing cleaning.



The camera cover must be used for only one patient and disposed of properly in accordance with local code.

Cleaning - Clean each component of the Spectra System as necessary by performing the following procedures.

1. Spectra Handpiece - Following every patient use, remove the camera cover from the handpiece and dispose in accordance with local regulations.
Between patients the handpiece can be wiped clean and disinfected with any non-corrosive surface disinfectant such as Birex® se. Do not apply the disinfectant solution directly to the handpiece. Instead, apply a small amount of disinfectant to a clean cloth and use it to wipe the handpiece. Dry the handpiece with another clean cloth.
2. Handpiece Window Lens - Remove debris or spots from lens window by cleaning with alcohol and cotton swabs.
3. 10mm Distance Spacers - Steam sterilize in a gravity steam sterilizer at 121°C for 30 minutes and dry time of 20 minutes before use and handle using gloves. Use a new replacement distance spacer as needed.

SPECIFICATIONS

Input Power:	USB powered device using less than 500 mA at 5 volts DC. No external power supply is required. No mains connection.
Video Outputs:	High Speed USB 2.0 Video
Sensor:	¼ Inch CCD
Format:	PAL
Pixels:	720 H X 576 V
Exposure Control:	Automatic
Illumination:	6 Blue-Violet (405 nm) LED lamps
Image:	Normal, not mirrored
Imaging Distance:	10mm set by distance spacer
Operating Temperature:	10 to 40° C (50 to 104° F)
Storage Temperature:	0 to 70° C (32 to 158° F)
Humidity:	10 to 90% non-condensing
Classifications:	Portable, Continuous Operation, Type BF Applied Part. No mains connection.
Protection for Ingress of Water:	Ordinary (per IEC 60529)
Flammable Atmosphere:	Cannot use in the vicinity of flammable anesthetic mixtures of air, oxygen or nitrous oxide.
Device Class:	USA - 21CFR/Class II Canada - MDR/Class II, EU - 93/42/EC as amended by 2007/47/EC Class I

PHYSICAL CHARACTERISTICS

Dimensions	Length	Width	Height	Weight
Handpiece:	8.6 inches (21.84 cm)	0.83 inches (2.11 cm)	1.15 inches (2.92 cm)	2.7 oz. (76.20 g)
Spectra Handpiece Cable D4020:	10 feet (3.05 m)			

ACCESSORIES

The following lists the ordering number and description for accessory components available to maintain and expand the Spectra System to meet your professional needs. Contact your Air Techniques Dealer for information.

Order

<u>Number</u>	<u>Description</u>
D4020	Spectra Handpiece Cable
D4060	Spectra Handpiece
D4170	Spectra Handpiece Holder with Chair-side Adapter
Replacement Disposable Camera Covers and Distance Spacers	
D4125	Box of 100
D4120	Box of 500
D4140	10mm Distance Spacers, Pack of 25
D4065	VISIX for Spectra Software
D4040	VISIX for Spectra Support Package
74500	Comprehensive VISIX Imaging Software, 5 Licenses, see below.

VISIX IMAGING SOFTWARE

Consider VISIX, our comprehensive digital imaging software application, providing seamless integration with our ScanX PSP digital imaging systems and Camera product family.

Key Features.

- Easy to learn.
- Simple to use.
- Acquire, mount, view and store images with just a few mouse clicks.
- Customize images to personal preferences with our simple Set-Up 1-2-3 tool.
- Exposure - Our Stop Light Exposure System is a unique indicator to ensure optimum data capture. It helps you acquire great images by monitoring X-ray exposure.
- Viewing - VISIX provides automatic image mounting that is completely customizable.
- Flexibility - VISIX includes a built-in bridging solution to over 35 Practice Management Software titles.

VISIX is the superb software complement for ScanX. Contact your authorized dealer for further information.

This Air Techniques equipment is warranted to be free from defects in material and workmanship from the date of installation for a period of 3 years.

Any item returned to our factory through your authorized Air Techniques dealer, will be repaired or replaced at our option at no charge provided that our inspection shall indicate it to have been defective. Dealer labor, shipping and handling charges are not covered by this warranty.

This warranty does not apply to damage due to shipping, misuse, careless handling or repairs by other than authorized service personnel. Warranty void if installed or serviced by other than your authorized Air Techniques dealer service personnel. Air Techniques, Inc. is not liable for indirect or consequential damage or loss of any nature in connection with this equipment.

This warranty is in lieu of all other warranties expressed or implied. No person or representative is authorized to assume for us any liability in connection with the sale of our equipment.

ON-LINE WARRANTY REGISTRATION

Quickly and easily register your new Spectra System on-line. Just have your product model and serial numbers available. Then go to the Air Techniques web site, **www.airtechniques.com**, click the **Warranty Registration** link and complete the registration form. This on-line registration ensures a record for the warranty period and helps us keep you informed of product updates and other valuable information.

Air Techniques is a leading manufacturer of dental products including air and vacuum systems, film processors, digital imaging systems and intra-oral digital video systems. We have been manufacturing quality products for dental professionals since 1962.

Air Techniques' products are only distributed through authorized dealers.

- A/T 2000[®] XR
- Acadia[™]
- Accent[™]
- AirStar[®]
- CleanStream[™]
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- VacStar[™]
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