

DV2 Perioscopy System

Operators Manual – Topic Index

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The manufacturer, assembler, and importer are responsible for the safety, reliability and performance of the unit only if:

- ✓ Installation, calibration, modification and repairs are carried out by qualified and authorized personnel
- ✓ Electrical installations are carried out according to the appropriate requirements
- ✓ Equipment is used according the operating instructions

DentalView pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation, this publication should not be regarded as infallible guide to current specifications. We reserve the right to make changes without prior notice.



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DV2 Perioscopy System

Section 1. Important Facts & Safety Information

I. Important Facts	
Classification	Class 1 (grounded) device Continuous Operation Type B
Equipment type	IPX1
Fuse rating	Refer to instructions printed on rear of unit
Intended Use	Federal Law (USA) restricts the use of this device by or on the order of a licensed dentist
Indications for Use	The DV2 system is intended for use in direct visualization and therapy of periodontal disease and other situations that would require direct visualization of structures beneath the intact gingival margin (gum line) within the oral cavity (i.e., root fractures, restoration margins, tooth decay)
Contraindications for Use	As with all dental treatment, the DV2 System and its accessories should not be used on individuals with heart murmur or artificial prosthesis without proper consultation and antibiotic pre-medication

II. General Safety Information	
Risk of Burn	Allow three to five minutes for lamp to cool prior to opening the lamp compartment Hot surface on lamp
Risk of Electrical Shock	Routinely inspect power cord. Replace power cord if inspection reveals damage
Risk of Explosion	Do NOT use in the presence of flammable anesthetics!

III. Maintenance Recommendations	
Prior to using the DV2 system	System check to ensure operability. Power, water and image quality
Immediately following use of the DV2 system	Follow specific infection control guidelines discussed in section 4 page 8 Remove and dispose contaminated sheath Secure endoscope in safe place to avoid damage to fiber. Section 4 page 8 Water line maintenance as discussed in Section 4 page 8 Rewind power cable and water cable in cable reels prior to moving

Technical Issues	Contact DentalView for specific guidelines and recommendations. Servicing of system will be arranged directly through DentalView
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IV. System components required to operate the DV2 Perioscopy System
DV2 Master Control Unit (MCU)
Endoscope – Fiberoptic bundle
Sterile window sheath
Transport stand with five wheel base
DV2 footswitch
Power cord
Irrigation supply tubing
The DV2 transport system includes the required footswitch; power cord and Irrigation supply tubing

DV2 Perioscopy System

Section 2. System Components & Technical Description

I. Master Control Unit (MCU)

1. MCU Front Panel

- A. Flat screen LCD monitor
- B. Power fault indicator
- C. Indicator LED lights
- D. Removable / sterilizable instrument holders / handles

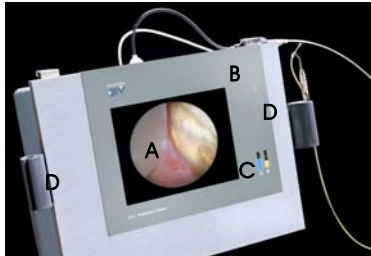


Image 1: Master Control Unit Front Panel

Front Panel Displays and Indicators

Color LCD Video Monitor Image 1- A	Provides real-time, detailed color images of the procedure site as viewed by the attached DV2 Endoscope
Power Fault Indicator Image 1- B	The LED will illuminate indicating that power is applied to the unit. During startup, the LED will glow RED until the illumination lamp has started. During normal operation the LED will glow GREEN. Under any fault conditions, the LED will flash RED (see trouble shooting section)
LED Indicator Lights Image 1- C	A series of ten LEDs show the current irrigation flow rate setting and current illumination brightness setting
Rubber Instrument Holders / Handles Image 1- D	Removable rubber handles to hold instruments and provide stable handle to tilt or move MCU as needed. These components need to be removed and sterilized after each use

2. MCU Rear Panel Controls

- A. Power input receptacle
 - a) ON/OFF switch
 - b) Fuse compartment
- B. Irrigation fluid inlet
- C. Composite RCA cable compatible video in-out
- D. Foot switch connector
- E. Lamp compartment
- F. Endoscope receptacle
- G. Irrigation fluid outlet
- H. Dual Endoscope retaining brackets

Rear Panel Controls and Functions	
Power Input Receptacle Image 2-A	Accepts hospital grade power cord supplied with DV2 stand
Power On/Off Switch Image 2-A	Setting the power switch to ON activates the unit, OFF deactivates the unit
Fuse Compartment Image 2-A	5x20mm 0.8A 250V SLO-BLOW fuses. See changing fuses on page 19 for additional information
Irrigation Fluid Inlet Receptacle Image 2-B	Accepts irrigation fluid from dental unit water line or office irrigation system
Composite Video In/Out Image 2-C	1V p-p, sync negative, 75Ω Allows connection to additional auxiliary devices with video capture, storage and printing capabilities
Foot Switch Connector Receptacle Image 2-D	Accepts the DV2 system footswitch cable plug supplied with DV2 stand
Lamp Compartment Image 2-E	Accepts the DV2 system lamp – see changing the lamp on page 18 for additional information
Endoscope Receptacle Image 2-F	Accepts the DV2 System Endoscope plug connector Endoscope attaches only one way to optic and illumination ferrule receptors Finger tight screw attachment
Irrigation Fluid Outlet – male luer-lock connector Image 2-G	Accepts DV2 system sterile sheath irrigation port connector
Dual Endoscope Retaining Brackets Image 2-H	Brackets on either side of MCU, holds Endoscope out of the way of the monitor and allows clinician to change holding site

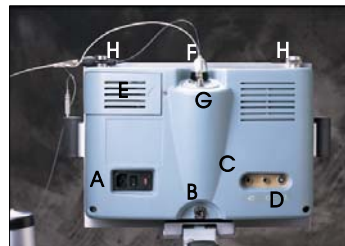


Image 2: MCU Rear Panel

DV2 Perioscopy System

Section 2. System Components & Technical Description

Features within the DV2 Master Control Unit	
High Resolution Color CMOS Camera	State of the art image capture system
Digital Signal Processor	Provides for video signal detection, processing, compression and conversion
Microscope Lens System	Enlarges image obtained by fiberoptic bundle
Short-Arc Metal Halide Illumination Lamp	Welch Allyn AL-1824 ARC Lamp Assy only Creates intense, focused light that is fiberoptically delivered to the working field
Swing Out Lamp Door	Provides easy access for bulb replacement
Dual Silent-Running Fans	Keeps illumination lamp, power supply and circuitry at optimal temperature
Continuously Flowing Irrigation System	Keeps field clear of blood and debris Connects to standard in-office water line
Irrigation Control Unit	Allows precise control over flow of water or other irrigant into the clinical field of view
Self Diagnosing Computer Operating System	Constantly monitors operability of system
Latest Solid State Technology	High-tech, long-lasting electronic components

II. DV2 Endoscope and Disposable Window Sheath System

1. Endoscope fiberoptic bundle
2. Sterile, disposable sheath
3. Spring tension connection
4. Endoscope connection ferrules

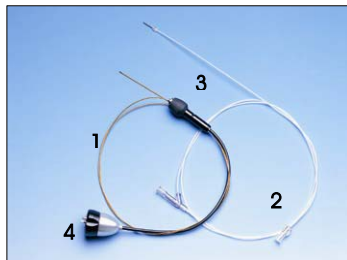


Image 3: Endoscope and Sheath

1. DV2 Endoscope

Feature	Function and Comments
0.99mm Flexible Fiberoptic Endoscope	1.2 meter working length
Reusable Fiberoptic Endoscope	DV2 Window sheath system eliminates need to sterilize Endoscope fiber which significantly extends life of Endoscope
Dual Purpose Light Transmission	Supplies light to working area and provides image return
10,000 Wave Guide (pixel) Image Fiber	Each total internal reflection guide is 2 microns in diameter, fused into a fiberoptic bundle
Illumination Fibers	19 individual 125 micron diameter fibers deliver intense light to the field of view
Quartz Casing	Sleeve for fiberoptic bundle
Hand Micropolished Gradient Index Lens	Located on distal tip of Endoscope fiber
Wide Field of View	Able to visualize within a 3 mm wide field
Working Depth of Field	In focus from 2-6mm from tip, 4.5mm optimum
High Magnification	24-48x depending on closeness to lens Zoom by moving tip closer to the object
Spring-Action Locking Mechanism Image 6	Creates tight, secure adaptation of sheath and Endoscope for clear, in-focus images



Image 4: Endoscope fiberoptic bundle



Image 5: Endoscope connection



Image 6: Endoscope spring action locking mechanism

DV2 Perioscopy System
Section 2. System Components & Technical Description

DV2 Endoscope	
Caution	<p>Federal Law (USA) restricts the use of this device by or on the order of a licensed dentist</p> <p>DV2 endoscope is a fragile component, comprised of over 10,000 glass fibers. At all times handle with extreme caution and care.</p> <p>DO NOT BEND – IT WILL BREAK</p>
Description	The DV2 Endoscope is a device intended to be used with the Perioscopy family of dental instruments. The Endoscope consists of a slender, flexible shaft containing both imaging and illumination capabilities. When inserted into the DV2 window sheath and dental instrument the Endoscope provides detailed and highly magnified images of the procedures site.
Special Considerations	The Endoscope does not require routine sterilization when used with the DV2 Window Sheath. The Window Sheath provides an intact barrier to pathogens preventing any cross contamination between the Endoscope and the patient.
Care and Maintenance	ALWAYS protect the Endoscopes fragile fiberoptic bundle with the orange protective sheath when not in use. If system is to be moved from room to room or transported to another location, completely remove Endoscope from the top of the system and store in protective box to safely transport. Place protective black caps on end of fiberoptic bundle and top of MCU to prevent dust from accumulating on lenses.



Image 7 – bi-lumen configuration

2. DV2 Window Sheath System

Feature	Function and Comments
Single-Use Disposable	<p>Eliminates the need to sterilize the Endoscope between cases</p> <p>Provides a significantly longer Endoscope life</p>
1.0 Meter Length	Allows for full reach without touching the floor
Bi-lumen Construction Image 7	<p>one lumen (clear tubing) completely covers the fiberoptic bundle</p> <p>second lumen (blue tubing) carries water irrigation to the working site</p> <p>Simultaneously maintains uniform opening for the endoscopic bundle and water supply</p>
Packaged Sterile	<p>Easily opened with gloved hands</p> <p>Three-year shelf life</p>
Sapphire Window (distal end) Image 8-A	Guarantees clear, dust-free image
Stainless Steel Hollow Tubular Tip (distal end) Image 8-B	<p>Houses Sapphire window</p> <p>Allows access to small anatomical recesses</p> <p>Protects distal tip of endoscopic bundle</p>
Precision Positioning Plug Image 8-C	Creates fluid-tight seal and ensures accurate positioning to the working tip of the instrument
Dual Luer-Lock Fittings (proximal end)	For water and endoscopic bundle connections

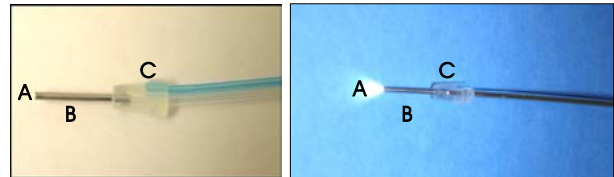


Image 8 – sheath tip configuration

DV2 Perioscopy System

Section 2. System Components & Technical Description

III. DV2 Stand / Transport System

1. Mounting plate for MCU
2. Swing arm for positioning adjustments
3. Front decorative panel
4. Power cord and reel
5. Water cord and reel
6. Five wheel base
7. Wheel lock

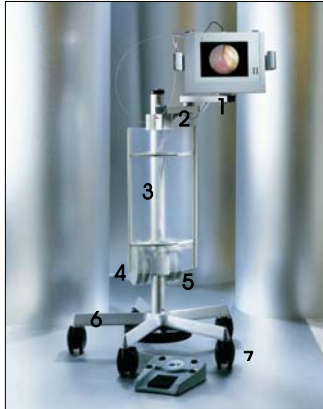


Image 9 - DV2 Stand / Transport System

IV. Foot Control – Rheostat

1. Irrigation flow pedal
2. Regulating buttons (+ and -) for irrigation flow control
3. Regulating buttons (+ and -) for illumination control



Image 10 - Foot Control

DV2 Stand / Transport System	
MCU Mounting Plate Image 9-1	Designed to hold MCU tightly on transport stand. Includes metal catch latch and four plastic finger screws for stabilization
Swing Arm Image 9-2	For positioning adjustments. With counterweight, swing arm can extend full length to allow various operating positions
Front Decorative Panel Image 9-3	Acrylic Panel with DV2 Logo to mask pole and cables of transport system
Power Cord and Reel Image 9-4	Power cord and water cord extends to 6 feet when fully extended. Cord reels in or out for cord management. Simple pull mechanism locks and unlocks reel
Water Cord and Reel Image 9-5	
Five Wheel Base Image 9-6	For sturdy base and easy transport from room to room
Wheel Lock Image 9-7	To reduce unwanted movement of system
Counter Weight Image 9-8	For stability of transport stand, particularly when swing arm is extended
Rheostat – Foot Control	
Irrigation Flow Pedal Image 10 -1	Pressing and holding pedal applies irrigation fluid to the attached sterile sheath at the flow rate set by the current irrigation flow rate setting. Releasing the pedal ceases flow
Regulating Buttons for Irrigation Flow Image 10 -2	Pressing the corresponding (+) or (-) switch will increase or decrease the irrigation flow setting by 1 unit. Pressing and holding the switch auto increments the illumination setting until the switch is released
Regulating Buttons for Illumination Image 10 -3	Pressing the corresponding (+) or (-) switch will increase or decrease the illumination setting by 1 unit. Pressing and holding the switch auto increments the illumination setting until the switch is released

DV2 Perioscopy System

Section 3. Operation and Functional Elements

I. Delivery of DV2 Perioscopy System

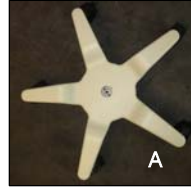
System is packaged and shipped in 4 boxes:

Box 1 – Assembled DV2 transport stand including power supply cord and reel, water supply cord and reel and foot control pedal

Box 2 – Wheel base and counter weight

Box 3 – DV2 Master Control Unit (MCU), a box with the Endoscope and a box with the DV instruments and plastic handles. **RETAIN MCU and FIBEROPTIC BOXES FOR FUTURE SHIPPING OR STORAGE**

Box 4 – DV2 sterile disposable sheaths



II. DV2 System Assembly Instructions

1. Cart and Wheel Base

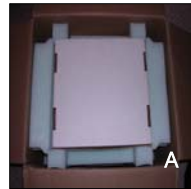
- Open box 2 and take wheel base out of box
- Open box 1 and take cart out of box
- Place lower cart pole in center hole of wheel base
- Insert and tighten black head bolt to secure weight on bottom of wheel base



2. Mounting Master Control Unit (MCU) onto Cart

- Open box 3
- Remove smaller white boxes 3-A and 3-B for later applications
- Remove green foam packaging material
- Gently lift Master Control Unit (MCU) out of box
- Slide MCU onto mounting plate of the cart
- Pull metal latch catch and slide MCU onto mounting plate until seated then release metal latch into opposing slot
- Tighten plastic finger screws under panel to tilt MCU at proper angle
- Plug the power supply (i) irrigation tubing (ii) and foot control cable (iii) into the appropriate receptacle on the back of the MCU

Note: red dot goes up on foot control cable

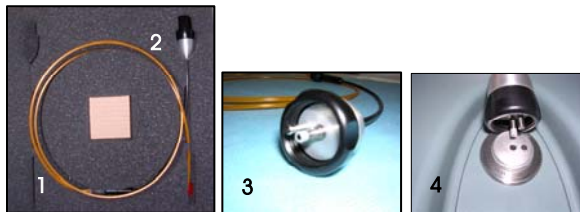


DV2 Perioscopy System

Section 3. Operation and Functional Elements

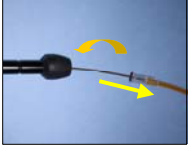
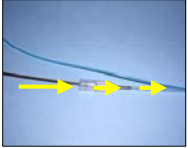

III. MCU and Endoscope Connection

DV2 Endoscope Attachment	
Inspection Prior to Use	<p>Look at the distal lens of the Endoscope to make sure there are no scratches, debris, fluid contamination, or other flaws and that the lens is intact. Debris may be removed by gently wiping with a lint free wipe moistened with water or 70% Isopropyl Alcohol.</p> <p>Inspect the surfaces of the Endoscope visually for dents, bulges, tears or other irregularities. Verify that there is no evidence of fluid seepage inside of the distal shaft.</p> <p>Inspect the proximal connector tip of the Endoscope to make sure there are no scratches, debris, fluid contamination, or other flaws and that the lens is intact. Debris may be removed by gently wiping with a lint free wipe.</p> <p>Should abnormalities or irregularity be suspected, do not use the Endoscope and report findings to DentalView.</p>
Connecting DV2 Endoscope to MCU	<p>Remove endoscope fiber from box 3-A.</p> <p>Remove the black cap from the Endoscope receptacle on the top of the MCU, and the black cap on the proximal connector of the Endoscope fiber.</p> <p>Align the image and light ferrules of the proximal connector of the Endoscope fiber to the Endoscope receptacle on the MCU.</p> <p>Insert the Endoscope into the Endoscope receptacle and tighten the lock-nut on the Endoscope.</p> <p>Insert the spring actuator of the Endoscope into one of the endoscope retainers (either left or right depending on usage) on the Master Control Unit.</p>



IV. Placing Window Sheath System to cover DV2 Endoscope and MCU

The DV2 Endoscope is intended to be used with the Perioscopy Window Sheath and family of dental instruments

1. Remove the orange protective sheath from the Endoscope and put it in a safe place. Luers disconnect counter clockwise. **DO NOT THROW PROTECTIVE ORANGE SHEATH AWAY!** 
2. The distal (working end) of the Endoscope should be disinfected before insertion into the Window Sheath by wiping with a sterile swab moistened with 70% Isopropyl alcohol. Be careful to remove all fibers and debris from the lens of the Endoscope. 
3. Insert the distal (working end) of the Endoscope into the Endoscope lumen (clear port) of the Window Sheath.
4. Gently slide the sheath over the endoscope fiber, advancing slowly until the sheath and endoscopes luer lock connectors meet. The male LUER-LOCK connector of the scope should thread easily into the female LUER-LOCK connector of the Window Sheath.
5. If resistance is met during sheath placement, **DO NOT FORCE THE SHEATH OVER THE ENDOSCOPE AT ANY TIME.** Forcing may permanently damage the fiberoptic bundle.
6. Secure the sheath to the spring actuator of the Endoscope by connecting the luer and gently twisting the sheath clockwise. The connection is designed to hold the Window Sheath onto the Endoscopes distal shaft.
7. Secure the Window Sheath irrigation inlet port to the irrigation outlet connector of the Master Control Unit by connecting the luer and gently twisting the water port of the sheath clockwise. 

DV2 Perioscopy System

Section 3. Operation and Functional Elements

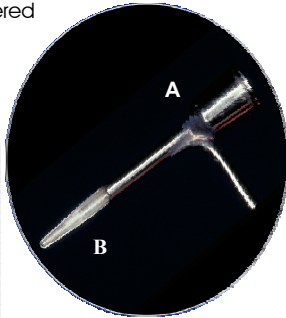
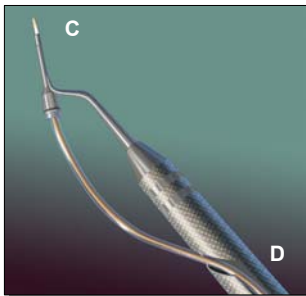
V. Instruments – DV Explorers

1. Set of 5 DentalView explorers
 - A. 2 – Right viewing
 - B. 2 – Left viewing
 - C. 1 – Full view – without tissue retractor shield, used without water for supragingival or surgical accessed viewing



2. Instrument Components

- A. Hollow endoscope mounting receptacle
- B. Tissue retraction shield (apex of instrument)
- C. Apex of sheath covered Endoscope
- D. Endoscope holding channel in handle

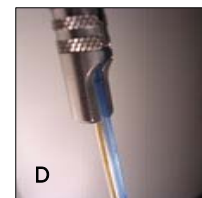
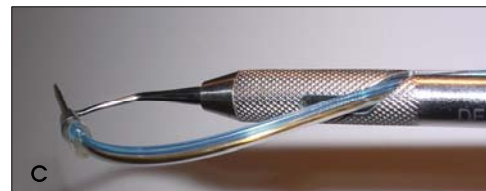
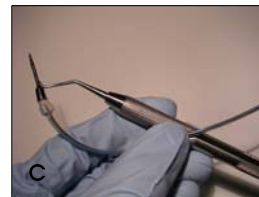
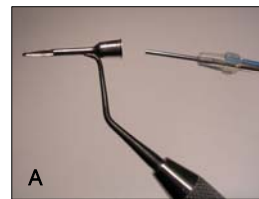


3. Loading the sheath covered endoscope into the DV explorer

- A. Insert distal end of sheath covered endoscope into mounting receptacle of instrument
- B. Position plug into mounting receptacle
 - a) Place instrument so tip is pointed down and mounting receptacle is in view
 - b) Position sheath covered fiber into receptacle with both channels of the sheath laying parallel to the instrument shank
 - c) Clear – fiber tubing on the left
 - d) Blue – water tubing on the right
- C. Create small loop in fiber then guide into endoscope holding channel in handle of instrument
 - a) Clear – fiber tubing should go into channel first
 - b) Blue – water tubing on top
- D. Secure fiber in channel at distal end of instrument by gently pressing fiber into instrument channel. DO NOT BEND fiber
 - a) Clear – fiber tubing should go into channel first. Will be a secure fitting
 - b) Blue – Water tubing on top

4. Changing DV Explorers

- A. Release fiber from distal end of instrument handle by gently pulling fiber out of holding channel
- B. Release fiber from mounting receptacle by gently manipulating sheath plug away from mount
- C. Reinsert fiber into new instrument following previous instructions.



DV2 Perioscopy System

Section 3. Operation and Functional Elements

VI. Power Initialization

1. Plug power cable from cart reel into power outlet
2. Plug power cable from top of cart into power receptacle on back of MCU
3. Push the Power switch to the ON position
4. All of the front panel LED lights will be lit indicating the power on sequence has started.
5. The illumination lamp will be started
6. Once the illumination lamp is lit and stabilized, the control unit will enter normal operating mode and the system self test light will turn from **Red** to **Green**



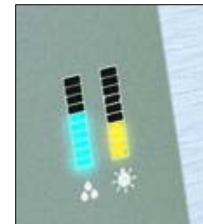
VII. Irrigation Line Preparations

1. Insert water tubing from cart reel into Dental Unit Water outlet. Make sure quick connect attachment is secure.
2. Turn compressor and water for the Dental Unit to the on position
3. Remove water irrigation line from the back of the MCU by pressing on the silver release button below the irrigation tubing connector
4. Run water through the irrigation line for two minutes to remove any sediment or biofilm in the water line. This is accomplished by compressing the white inner tubing and allowing the water to flow freely for two minutes
5. Re-attach the irrigation tubing to the irrigation inlet port on the back of the MCU
6. Set the irrigation flow rate setting on the foot pedal to maximum
7. Press and hold the irrigation control pedal until fluid has filled the lines and exits the sterile sheath
8. Release the irrigation control pedal



VIII. Adjusting the Illumination Level

1. Depending on the distance from the tip of the Endoscope to the object being viewed, more or less illumination may be required
2. Adjust the illumination level as needed to obtain a suitable image as required using the corresponding (+ or -) footswitch controls



IX. Adjusting Irrigation Flow Rate

1. Depending on the amount of blood and debris present in the visual field, more or less irrigation flow may be required
2. Adjust the irrigation flow rate as needed to obtain a clear field of view using the corresponding (+ or -) footswitch controls



DV2 Perioscopy System

Section 4. Service & Maintenance

I. Following Endoscopic Procedures

1. Remove all sterilizable components and process following standard sterilization protocol.
 - A. Instruments
 - B. Instrument holders / handles
2. Remove and discard contaminated disposable sheath from fiberoptic bundle
3. Place protective orange sheath over Endoscope for protection
4. DV2 smooth surfaces can be cleaned with disposable towels followed by an approved intermediate – level surface disinfectant between patients
5. Make sure cables and water lines located on back of MCU are not crimped in swing arm of transport stand

II. Water Line Maintenance

Treat the internal water supply line of your DV2 system as you would treat any other dental unit water line

1. Prior to use:
 - A. Dental unit water line should be flushed with water for at least two minutes prior to attaching any devices including the DentalView system
 - B. Remove water cable from back of MCU and flush water lines for two minutes prior to use
 - C. Reconnect water tubing to MCU and then run water through MCU prior to patient use
2. Following use:
 - A. After using the DV2, drain all water from the cart and MCU
 - a) Remove quick connect from the dental unit water line and plug into air connector (or change to empty water bottle for self contained systems
 - b) Remove the water cable from the back of MCU. (press lever under attachment to release water line connector) Once released, press the inner white tubing to release water pressure and water from tube line. (direct tubing towards sink or cup to collect the water in the line)
 - c) Press DV rheostat to run air through the MCU and completely dry line
 - B. Disinfectant should be added through an injection port or to the reservoir of an independent water system. After the recommended contact time, flush water until the disinfectant is no longer visible (usually 30 seconds to 1 minute)

III. Endoscope / Fiberoptic Bundle

1. ALWAYS protect fiberoptic bundle with orange protective sheath and dust cover when not in use. If system is to be moved from room to room or transported to another location, completely remove Endoscope from the top of the system and store in protective box to safely transport.
2. Place protective black caps on end of fiberoptic bundle and top of MCU to prevent dust from accumulating on lenses.

IV. Removing the Master Control Unit (MCU) from the DV2 Stand – for transport or maintenance

1. Remove Endoscope from the top of the MCU and place in protective box for storage.
2. Remove cables from back of MCU
 - A. Power cable
 - B. Irrigation line tubing
 - a) Compress metal lever under tubing connection on MCU.
 - b) Tubing should release easily, but may need simple manipulation to completely release.
 - C. Foot Switch cable
 - a) Finger pull to release
 - b) Red dot goes up
3. Loosen 4 plastic finger screws from mounting plate below MCU. Finger screws do not need to be completely removed but need to clear top of mounting plate for MCU to slide off.
4. Release metal catch latch by pulling down and holding down while sliding the MCU from the mounting plate.
5. Gently manipulate MCU, and pull from mounting plate.
6. Place MCU in box with packaging material provided from DV for storage or shipping.

DV2 Perioscopy System
Section 4. Service & Maintenance

V. Changing the lamp

1. Turn Power OFF
2. Unplug Power supply
3. Open access door using a small cross head screwdriver
4. Unplug lamp cable from lamp



5. Swing lamp out from unit
6. Lift retaining wire from lamp spring
7. Pull and lift lamp to remove
8. Only use lamp provided by DentalView for replacement



9. Fit new lamp into lamp compartment with small notch on lamp fitting into corresponding slot in mount.
10. Hold down side springs, and lower spring retainer.
11. Lock retaining wire over lamp spring



12. Swing lamp back into unit
13. Reconnect lamp cable to lamp
14. Close access door and replace screw

VI. Changing Fuse

1. Turn Power OFF
2. Unplug unit from wall outlet
3. Unplug power cord from power receptacle on rear of unit
4. Open fuse drawer (a small screwdriver works well)



5. Remove fuse drawer
6. Select the proper replacement fuse by referring to the instructions printed on the rear panel of the unit.
7. Slide the fuse drawer back into the unit
8. Close the fuse drawer cover



With the exception of lamp and fuse replacement, refer all servicing and adjustments to qualified personnel. **DO NOT** remove rear cover as this may result in damage and will **VOID THE WARRANTY.**

DO NOT RETURN SYSTEM TO DENTALVIEW FOR SERVICE WITHOUT CONTACTING DENTALVIEW FIRST FOR PROPER DOCUMENTATION AND RMI.

CALL CUSTOMER SERVICE AT 1-949-450-9735 FOR SPECIFIC RMI AND SHIPPING INFORMATION

DV2 Perioscopy System

Section 5. Technical Tips & Trouble Shooting

**Please call DentalView's Customer Service for
Questions, Comments or Concerns
1-949-450-9735**

Technical challenges that may be encountered when using the DentalView endoscopic system, and suggestions to remedy the situation:

I. WATER

Water is necessary to clear the field of view during the Perioscopy procedure. It is vital to have a stream of water coming through the dental unit, master control unit and sheath. However, because of varying factors such as water pressure and water quality, there may be issues that are unavoidable and need special service.

No Water – or Low water coming through system

Problem: Water adjusted too low on master control unit, water pressure in dental unit too low or obstruction in water line is preventing water from going through system

Solution: Increase water coming through system by pressing the (+) button on the rheostat. If there is still no water it is suggested to do a quick trouble shoot to determine where the water problem is occurring. First, make sure the dental unit water is turned on and pressure is adjusted to 45 – 60 PSI. Next, try to determine where the water has stopped by first disconnecting the water line from the dental unit. Press the valve to see if water is coming out of the dental unit and also out of the water line to the MCU. Then disconnect the water line from the back of the MCU. Press the small white pressure valve on the end of the water line to determine if water is coming through the line. If water is getting to this point, but not coming through the MCU, remove the sheath attachment and press the rheostat to see if water is flowing through the system. The last place water could be obstructed is in the sheath itself.

- A. If the water is obstructed in the dental unit water line or the water pressure is too low, contact the service representative for your dental unit
- B. If water is obstructed within the MCU, it is advisable to call DentalView directly to determine the best course of action
- C. If the water is obstructed from coming through the sheath, then replace the sheath and contact DentalView to report the problem
- D. It may be advisable to check the rheostat connection on the back of the MCU as well. The rheostat connection may be loose or malfunctioning. Test the rheostat by pressing any of the (+) or (-) buttons and observe the front LED lights to see if they correspond with the changes
- E. Check to make sure water tubing has not been crimped in any location

Problem: External filter element clogged

Solution: Clean out filter element from sediment bowl

- A. unscrew sediment bowl from flow control top
- B. Remove filter element from sediment bowl

- C. Ultrasonic clean or hand wash sediment bowl and filter element using a mild alcohol/water solution. When finished thoroughly rinse
- D. Replace filter element in sediment bowl
- E. Assemble to flow control top and test water flow
- F. If flow rate is still low, contact DentalView for further instructions

Water dripping at the sheath connector on MCU

Problem: Sheath not connected properly

Solution: Remove and re-insert the water connector portion of the sheath. Make sure you are not cross-threading the lure connector, and twist firmly to seat the connection securely.

Water dripping from the back of the MCU

Problem: Water connection may be damaged or obstructed

Solution: Release the water connection tubing from the back of the MCU by pressing the release valve under the connection. Make sure there are no impediments in the valve and the o-ring is intact. Re-connect and press the rheostat to determine if the problem has been solved. If there is still water dripping, it is advisable to contact DentalView for further instructions. **Please Note:** All of the system's internal control mechanisms are adequately isolated so water will NOT damage the system or harm anyone or anything. There is no need for caution or concern with water leaks from the back or top of the MCU.

Water dripping from sheath

Problem: Flaw in seal of sheath

Solution: This poses no particular problem for continued use of the system unless it limits the amount of water actually getting to the working end of the sheath. Divert the water drip so it won't drip on the patient, or remove the sheath and load a new sheath over the scope.

If this occurs, contact DentalView and provide information such as lot number and description of defect.

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II. MASTER CONTROL UNIT (MCU) – TECHNICAL

All of the technical components of the dental Endoscope are housed within the MCU. The system goes through a self check when first turned on that will scan all of the systems to determine if there are any issues that may interrupt the function of the system. There is a LED light on the top left of the front panel that will be red while this self-check is taking place. Once the light turns green, the self-check is completed and the system is ready to be used.

Blinking LED lights

Problem: Red indicator light remains or starts blinking and doesn't turn green

Solution: This indicates something is compromised internally. Turn off the system and re-start. If the blinking continues, it is advisable to contact DentalView to determine the best course of action to manage the situation.

Section of LED display is not lighting up

Problem: LED light elements have malfunctioned

Solution: This does not indicate any specific problems within the system and should not be a concern for the technical aspects of the system. This situation should be reported to DentalView and can be changed when the system is serviced for any reason.

One or both of the LED light displays is flashing

When the unit is powered on, the CPU does a system check. If a problem is found an error code is given:

Error code: ONLY the Light Source LED bar flashes up and down

Problem: The safety switch is not seated

Solution: Remove the ARC lamp door and reseal the safety switch.

Problem: The ARC-Lamp is defective

Solution: Replace or reseal as necessary.

Error Code: The unit is powered on (initially starts correctly) and after 20 – 40 seconds **ONLY the Water Source LED Bar** flashes up and down

Problem: Two of the buttons on the footswitch are stuck

Solution: Remove the footswitch cable from the back of the MCU. Press each button by hand and listen for it to click. Reattach cable to the back of the MCU. If problem persists, footswitch will need to be replaced.

Error Code: The unit is powered on (initially starts correctly) and then after 1 to 5 minutes **BOTH the Light Source and Water Source LED Bars** are flashing up and down.

Problem: The MCU has over heated

Solution: Turn off MCU and contact DentalView for assistance.

No power to system

Problem: Electrical connection may be interrupted, or fuse blown within system

Solution: Check all electrical connections, first to the wall socket then next to the back of the MCU. If these are both functioning, a fuse may be blown within the system. Two small fuses are housed in the fuse box next to the power control on the back of the MCU. These fuses can be removed and replaced similar to any fuse connection. Contact DentalView for specific fuse and installation instructions.

III. IMAGE – TECHNICAL

White out on monitor with no visible image

Problem: Connection within the MCU is loose or damaged.

Solution: Contact DentalView to determine course of action.

Concentric circles on the monitor or static image display on the screen

Problem: The spring loaded black connector is not in proper tension

Solution: Release the sheath from the fiberoptic bundle by unscrewing the black luer-lock connector. Gently jiggle the fiber into the sheath and reattach making sure that there is a slight give in the spring load at the connection.

White light on image

Problem: Scope not seated in sheath properly. Scope is reflecting off of the metal lumen at the tip of the sheath

Solution: Release sheath connection and slightly jiggle or adjust scope into lumen. This should restore a proper seating in sheath and adjust image on monitor.

Faint, indiscernible image

Problem: The fiberoptic is not snugly inserted into the instrument mount or in the sheath properly

Solution: Re-adjust the sheath to fit snugly into the instrument mount. Make sure there is enough slack so that the plastic plug is not pulled out of the thistle.

Dark faint image

Problem: Illumination/contrast on monitor is adjusted too low. Light bulb may have burned out or placed in bulb mount incorrectly.

Solution: Increase the contrast on the monitor by pressing the light (+) button on rheostat. If that doesn't work, check light source by unscrewing the fiberoptic bundle at the top of the MCU. If little or no light is coming out of the top of the MCU, the bulb may need to be replaced.

Replace bulb by following DentalView's instructions, specified in Section 4 page 11. The light bulb seats in the holder a specific way. If the notches on the light bulb and holder are not aligned, the light bulb is improperly seated and will not work optimally. Remove the light bulb and seat bulb with notch of bulb fitting directly into the notch on the holder.

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Section 5. Technical Tips & Trouble Shooting

Static mosaic, or partial image on monitor

Problem: A static mosaic image and/or irregular or black spots on the monitor, most likely the delicate fiberoptic bundle has been broken at some point

Solution: Change and replace fiberoptic bundle with second fiber.

PLEASE NOTE: The fiberoptic bundle is made up of glass fibers and can fracture easily if bent too sharply, snapped or crushed. To avoid this problem, always be sure to gently hold the fiberoptic by the plastic plug when inserting and removing the fiber from the instrument mount. Also protect the scope from being bumped or compressed when moving the system from room to room.

Always protect the fiberoptic bundle when it is not in use, by covering it with the orange protective storage sheath or removing the entire fiber from the unit and storing it in the protective box.

IV. IMAGE – TECHNIQUE

Blurry image

Problem: A blurry image often comes from a water droplet hovering over the sapphire window on the distal end of the sheath

Solution: Tap the foot pedal or insert the instrument tip further subgingivally. Wiping the end of the instrument with a cotton gauze or the patient napkin can also clean the debris and water from the instrument shield and sapphire window. It is recommended that there is a continuous flow of water while the instrument is subgingival.

Black dots on image

Problem: Dust or debris from black packaging material on lens

Solution: Take off sheath and wipe end of fiberoptic bundle with a damp alcohol gauze. If black dots are still present, remove fiberoptic bundle from top of MCU and wipe off lenses on top of MCU and on fiberoptic bundle. This will most times clear any particle from the lens.

Light reflection obscures image

Problem: Intense fiberoptic light is reflected off of the water, crown or restorations

Solution: Insert the tip of the instrument further subgingivally or completely remove the instrument from the sulcus. It may also be helpful to open the angulation of the instrument away from the reflective source.

Unable to visualize root surface

Problem: Soft tissue interfering with the visualization of the root surface. The tip of the instrument may be off the root surface and into the tissue. It is also possible there is excess inflammation in the area, and the boggy tissue is completely surrounding the instrument tip.

Solution: Adjust your adaptation of the instrument tip to the tooth surface by rotating your wrist. It may be necessary to completely remove the instrument from the sulcus and reinsert, making sure that the tip of the instrument follows the anatomy of the root into the pocket and is always in contact with the root surface. The light source or lens needs

to be facing the root surface with the tip directly on the surface of the root at all times for the best image to be visualized.

V. SHEATH

Special Note: DentalView's sheath system is designed and approved as a single use item. Re-using sheaths or trying to sterilize sheaths for use on future patients is not recommended or sanctioned by the company. Due to the highly technical nature of the sheaths, the components are not designed to withstand sterilization heat or chemical treatments. The two lumen design and the blue sapphire window on the end of the sheath are all compromised when exposed to such procedures and cannot be guaranteed safe or sterile for use on patients.

Image appears foggy

Problem: Endoscope may not be seated completely in sheath

Solution: Gently rotate sheath in instrument positioning plug to change location of fiber against the sheath lens.

Problem: Debris has accumulated on the surface of the sapphire lens

Solution: Gently wipe the lens with a cotton gauze to clean the debris from the lens.

Re-using sheath may also cause this to occur. The outer surface of the lens may have been exposed to chemicals or the inner surface of the lens may be reflecting shreds of plastic from re-inserting the fiber into the sheath. This type of obstruction generally cannot be cleaned and a new sheath will need to be used for a clear image to appear.

Unable to Load Scope Into Sheath

Problem: Sheath may be damaged or defective due to problem in production, shipping or storage.

Solution: Do not force the fiberoptic bundle into the sheath if the sheath is crimped or damaged. Forcing the sheath could accidentally break fibers within the endoscope bundle.

VI. STAND / TRANSPORT SYSTEM

MCU tilts too easily –doesn't stay in place when adjusted

Problem: Mounting plate connection is loose

Solution: Remove MCU from mounting plate. Rotate mounting plate as far forward as possible to expose screws that have become loose. Using a hex wrench from DV maintenance package, tighten loose screws and replace MCU.

For technical issues that have not been addressed or cannot be managed,

Please contact

DentalView's Customer Service

1-949-450-9735