



USER'S MANUAL

**Cogentix Medical DPU-7000 Series
Digital Video Processors**

DPU-7000A

NOTE: Federal (USA) law restricts this device to sale by, or on the order of, a physician or other appropriately licensed medical professional.

www.cogentixmedical.com

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How to Use This Manual

This User's Manual contains instructions on the proper use of the Cogentix Medical **DPU-7000 Series** Digital Video Processor, which includes the following model:

- **DPU-7000A** Digital Video Processor

This manual is intended for physicians and other medical personnel who will come in contact with the Video Processor before, during, and after any patient procedures in which they are used. All users should read and become familiar with this entire manual before use.

The manual contains the following information:

- The intended use of the Video Processor and peripheral equipment
- Descriptions of the Video Processor's features and settings
- Instructions on installation, operation, and proper care and storage of the equipment
- Warning and Caution statements that must be observed to ensure patient and user safety while using the equipment

The **DPU-7000 Series** Digital Video Processor is designed to work with the Cogentix Medical **5000** and **7000 Series** Videoscopes, or other Videoscopes manufactured by Cogentix Medical cleared for use with the **DPU-7000 Series** Digital Video Processors. Thoroughly review the User's Manual for the endoscope that will be used in conjunction with the Video Processor.

The information in this manual is applicable to all models in the **DPU-7000** series. However, model-specific information will be clearly indicated wherever it appears.

If you are a **first time user**, Cogentix Medical strongly recommends that you read this manual from beginning to end and become intimately familiar with the Video Processor and its use.

If you are an **experienced user**, select specific chapters and/or sections that pertain to the features that you are using.

Organization of this Manual

Following is a list and brief descriptions of the chapters in this manual. Each chapter's title is listed at the top of all pages after the title page, so that you can quickly access the information you need.

Chapter 1, Symbols and Terms – This chapter shows and defines the symbols and labels that appear on or are attached to the **DPU-7000A** and peripheral equipment. There is also a brief list of the common terminology that is used in the manual.

How to Use This Manual

Chapter 2, Important Information – This chapter describes the Video Processor’s intended use and summarizes the critical Warning and Caution statements in the manual. This information is essential to the safe operation of the Video Processor. Cogentix Medical strongly recommends that this chapter be read thoroughly and completely understood by all users before working with the processor.

Chapter 3, Equipment and Functions – Introduces the **DPU-7000A** Digital Video Processor and compatible peripheral equipment. This chapter includes instrument diagrams, identifies system components, and defines their functions.

Chapter 4, Preparation and Inspection – This chapter describes how to prepare the Video Processor and peripheral equipment for use, and includes instructions on the proper assembly of all equipment. The chapter also details a thorough inspection procedure to confirm that all equipment is undamaged and working properly before it is used.

Chapter 5, Menus and Sub-Menus – Describes the menus displayed by the Video Processor on its LCD monitor. This chapter starts with the Main Menu, and further elaborates on all of the available sub-menus and the settings and selections that can be made from these menus.

Chapter 6, Operation – Describes the Video Processor’s front panel and LCD panel controls, screen structure and modes. This chapter also provides information on keyboard keys which are used to activate Video Processor functions.

Chapter 7, Adjust the Image Quality – This chapter details the basic steps to adjust and optimize the endoscopic image before using the Video Processor in a procedure.

Chapter 8, Maintenance and Storage – Describes steps to take in order to clean and disinfect the Video Processor after a procedure is performed. There are also instructions on fuse replacement and proper storage environments to employ when the Video Processor is not going to be used for a prolonged period of time.

Chapter 9, Troubleshooting – Describes possible problems that could arise during the operation of the Video Processor, and suggests corrective actions that may assist in solving them.

Chapter 10, Warranty and Service – This chapter contains the terms of the Cogentix Medical warranty on the Video Processors, any restrictions that apply, and user actions that may void the warranty if taken. This chapter also includes shipping instructions in case the Video Processor must be returned to Cogentix Medical for repair.

The **Appendix** details the unit’s technical specifications and electromagnetic compatibility declarations.

Additional Information

The information in this User's Manual is subject to change without notice. If you have any questions regarding any of the material contained in this manual, or wish to confirm that this is the most-comprehensive information available for this product, please contact your local distributor or Cogentix Medical Customer Service Department at 866 258-2182 (toll free in U.S.) or (+1) 952 426-6189 (international calls).

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1 Symbols and Terms

Symbols

The symbols listed below can be found on the **DPU-7000 Series** Video Processor and on other components of the system.

-  Alternating current
-  Power OFF
-  Power ON
-  Alerts the user to the presence of important operating, maintenance, and service instructions. Refer to the user's manuals for warnings and safety precautions associated with equipment used in the procedure.
-  Equipotentiality grounding terminal
- S/N** Serial number of the Video Processor
- REF** Catalog number of the Video Processor
-  Type BF applied part (safety degree specified by IEC 60601-1) for protection against electrical shock. This symbol appears on the endoscope.
-  The presence of this mark shows that the device is Classified Medical Equipment with respect to electrical shock, fire, and mechanical hazards only in accordance with ANSI/AAMI ES60601-1 (2005) (IEC 60601-1 Third Edition), CAN/CSA C22.2 No. 60601-1 (2008), IEC 60601-1-2, Third Edition, and IEC 60601-2-18, Third Edition.
-  This equipment has been designed, tested and certified as essentially compliant with all applicable European Union (EU) regulations and recommendations.
-  Do not dispose of as household waste. This product is designated for separate collection at an appropriate collection facility.
-  The presence of this symbol on the product or packaging indicates that the device is RoHS compliant.
-  Consult Instructions for Use

Terms

The following terms are used throughout this User's Manual:

"Processor", **"Video Processor"**, or **"Unit"** refers to the **DPU-7000A** Digital Video Processor.

"System" refers to a Video Processor with an endoscope connected to it.

"DPU-7000 Series" refers in a general manner to the Digital Video Processor models.

2 Important Information

The information in this chapter is essential for the correct and safe operation of the **DPU-7000 Series** Digital Video Processor. Please read and understand this information before preparing or using the processor or any peripheral equipment with which it will be used.

Intended Use

The **DPU-7000 Series** Digital Video Processors are intended to be used in conjunction with the Cogentix Medical **5000** and **7000 Series** of Videoscopes or other Videoscopes manufactured by Cogentix Medical cleared for use with the **DPU-7000 Series** Digital Video Processors for the display and management of video images during endoscopic procedures.

Do not use the equipment for any purpose other than its intended use.

User Qualifications

This equipment should only be used in a medical facility by or under the supervision of a physician trained in endoscopic procedures. Do not use in any other locations or for any other purposes than the intended application.

Only use the equipment according to the instructions and under the operating conditions described in this User's Manual. Failure to do so could result in compromised safety, equipment malfunction and/or instrument damage.

If training assistance is desired from either the manufacturer or a local distributor, please contact Cogentix Medical Customer Service at 866 258-2182 (toll free in U.S.) or (+1) 952 426-6189 (international calls).

Maintenance and Repair

DPU-7000 Series Digital Video Processors contain no user-serviceable parts (except for fuse replacement); never attempt to modify or repair them. Doing so may cause further equipment damage and/or compromise patient safety if the Processor is subsequently used in a procedure. The Processor may only be serviced or repaired at an authorized Cogentix Medical facility.

In addition to thoroughly inspecting the Processor before each procedure, it should be periodically inspected to determine if there is wear or damage that requires attention.

Refer to Chapter 8, *Maintenance and Storage* for procedures on maintaining the **DPU-7000 Series** Digital Video Processor.

Refer to Chapter 10, *Warranty and Service* for information on returning the **DPU-7000 Series** Digital Video Processor to Cogentix Medical for service.

Signal Words

Information included in this manual to alert users to the possibility of patient injury and/or equipment damage is signified by the Warning and Caution symbols below. Notes are also included in the manual to supply additional helpful information to users.



Alerts the user to situations which, if not avoided, could result in death or serious injury.



Alerts the user to situations which, if not avoided, could result in moderate or minor injury to the user or patient. It is also used to alert the user to conditions and actions that could cause equipment damage.



NOTE: Indicates additional helpful information.

Safety Precautions

The following precautions should always be exercised when using the **DPU-7000 Series** Digital Video Processors and all other electromedical equipment used during the procedure to ensure safety for all involved parties – user(s), patient(s), etc.

Before Use



Never drop the equipment or subject it to severe impact, as it could compromise the functionality and/or safety of the unit. Should this equipment be mishandled or dropped, do not use it. Return it to an authorized Cogentix Medical service facility for inspection and repair.

Carefully inspect all equipment before using it in a procedure, and do not use any equipment that is damaged or excessively worn. Doing so could lead to patient injury and/or further damage to the equipment.

Do not install or use **DPU-7000 Series** Digital Video Processors in the following environments or conditions:

- In areas where flammable or explosive gases or chemicals are present. This could result in fire or explosion.
- In areas where they could become wet or exposed to conditions such as high temperature, humidity, direct sunlight, dust, salt, etc.
- In areas where they could be subjected to impacts or vibrations.
- In areas where the air intake vent is obstructed or blocked.

Do not allow the power cord to become twisted, crushed or pulled taut. Otherwise, the cord could become damaged.

All devices connected to **DPU-7000 Series** Digital Video Processors must be Classified Medical Equipment. If additional equipment is connected to the processor, the operator must determine that all equipment complies with the appropriate end-product safety standard (such as IEC 60950 or IEC 60065) and the Standards for Medical Electrical Equipment, UL 60601-1 or IEC 60601-1, and Safety Requirements for Medical Electrical Systems, IEC 60601-1-1.

To prevent electrical shock when used with endoscopes, this equipment is insulated (type BF electromedical equipment). Do not allow it to be grounded to other electrical devices being used on the patient. Rubber gloves should always be worn to prevent grounding through user(s).

During Use

**WARNING**

Make sure that there is no patient contact with this equipment. Doing so can cause patient and/or operator injury.

To prevent electrical shock, the endoscope and/or any other ancillary device(s) connected to the unit should never be applied directly to the heart.

If the operation of any component of the endoscopic system fails during the procedure, or if the endoscopic image is lost or compromised, place the endoscope's Distal Bending Section in the neutral position and slowly withdraw it from the patient.

Continually monitor this equipment and the patient for any irregularities during the procedure. In the event that an irregularity is noted with the patient or this equipment, take the appropriate action to ensure the patient's safety.

3 Equipment and Functions

DPU-7000A Digital Video Processor

The **DPU-7000A** Digital Video Processor is designed to work exclusively with the Cogentix Medical **5000** and **7000 Series** of Videoscopes or other Videoscopes manufactured by Cogentix Medical cleared for use with the **DPU-7000 Series** Digital Video Processors. The Video Processor anchors a complete endoscopic solution for clinical settings, delivering optimal image quality, ease-of-use, and reliability. On-board controls and functions allow users to enhance brightness, adjust contrast, and balance colors for accurate image representation. The Video Processor combines advanced technology with user-friendly design to offer the most comprehensive array of features and functions for medical practitioners and clinical staff when performing endoscopic procedures.

An intuitive user interface with drop-down menus provides critical customization options and enhances efficiency, while video / audio recording and playback enables the user to capture spontaneous patient data. The system's user-friendly design makes it easy for any operator to quickly learn the features and functions, and to customize user preferences. Automatic personalized, multi-user settings and patient information can be easily stored (archived), searched and retrieved.

The Video Processor's functions can be accessed from the built-in keyboard, on-screen menus, the unit's front panel, and/or the LCD keypad (just below the screen). Functions can either be set before procedures or changed during them. Pre-programming specific Processor functions into the Control Buttons of a connected endoscope enables users to capture and print images or activate other functions without disrupting procedures.

Models and Features

The **DPU-7000A** model is equipped with an onboard 15-inch LCD display (folds down on top of the processor) and an integrated air pump, used with the Cogentix Medical **TNE-5000** Flexible Video Esophagoscope. The unit can accommodate both analog and digital external monitor connections.

Standard Features of the DPU-7000A Model:

- Support for Cogentix Medical **5000** and **7000 Series** Videoscopes and other cleared videoscopes manufactured by Cogentix Medical
- Support for **DCH-5000** add-on camera for imaging with fiberoptic or rigid endoscopes
- High-resolution digital processor with superior image quality
- Video and Audio recording and playback
- Image enhancement and manipulation functions

Equipment and Functions

- Intuitive user interface with drop-down menus
- Digital Video Output – HDMI compatibility
- Automatic endoscope-specific and user-specific settings
- Multi-User settings; easily stored and retrieved
- Patient Day List (for advanced scheduling)
- Patient information and media files; easily archived, searched, and retrieved
- Custom keyboard built-in with one-button access functions
- Multilingual support for on-screen displays and menus
- International keyboard support; USB port for external keyboard
- Internal loudspeaker or external speaker output for audio playback
- Data (RS-422) Interface for STR-5000 Stroboscopy data
- SD (Secure Digital) Card Slot for image capture and management
- Additional USB ports for backup and printing
- Record audio notes during video recording
- Freeze function with live picture-in-picture window
- Processor functions that are operable from:
 - Videoscope Control buttons
 - The Video Processor's front panel
 - External / Internal Keyboard
 - Dual Foot Pedal (optional)
- Remote control of peripheral devices such as video printers or recorders
- Adjustable light controls for endoscope-based LED illumination
- Adjustable shutter window size
- Automatic or manual shutter speed control
- On-screen clock and stopwatch
- Compatibility with multiple peripheral devices
- Color bar display for monitor adjustment
- Volume control for audio playback
- Air Pump for transnasal esophagoscopy procedures

Inspect the Standard Set

When the Video Processor is received from Cogentix Medical, immediately confirm that the appropriate items listed on the next page were received, and inspect them for damage. If any item is missing or damaged, do not use the equipment; contact Cogentix Medical to obtain replacement components.

DPU-7000A Digital Video Processor Standard Set	
COGENTIX MEDICAL CATALOG NO.	DESCRIPTION
07-7001	DPU-7000A Video Processor with Integrated Air Pump
07-7026	SD Card, 16 GB, DPU-7000 Series
07-2062	Composite Video Cable
07-2060	Y/C Video Cable (4 pin Mini DIN – 4 pin Mini DIN 1.5m)
	Power Cord, US 3-prong Plug, Hospital Grade
	DPU-7000 Series User's Manual (this document)
OPTIONAL ITEMS AND ACCESSORIES (NOT SHIPPED WITH VIDEO PROCESSOR)	
07-5033	Fuses (4A), DPU Series (Replacement)
07-5010	DCH-5000 , NTSC Digital Camera Head (includes Camera Head, Lens and Coupler)
07-5011	DCH-5000 , PAL Digital Camera Head (includes Camera Head, Lens and Coupler)
07-5020	Dual Foot Pedal (DPU-5000 & 7000 Series)
07-2064	Cable, Remote Control, Mini Plug – Mini Plug 1.5m
07-5022	Cable, USB A to USB B 2.0m
07-2063	Cable, RGBS Video
07-7024	Cable, VGA Video
07-7027	Cable, Audio for STR-5000
07-5076	Cable, Strobe Data
07-7020	Cable, Digital Display HDMI to HDMI
07-7021	Cable, Digital Display, HDMI to DVI, 2.0m
07-7022	Cable, USB A to USB A 2.0m (Male/Female Extender)
07-7025	Cable Pack, 7000 Series
07-7023	External Keyboard, DPU-7000
07-7037	Desktop Microphone, Gooseneck, 3.5mm Connector
07-7042	24" External LCD Monitor, HDMI Input
07-7040	External Hard Drive, USB
07-7038	Speakers, Stereo, USB Powered, 3.5mm Stereo Audio Connector
07-7036	Headset with Integrated Microphone, 3.5mm Connector
07-7034	Laser Printer, Color
07-7030	Medical Grade Isolation Transformer

Table 3-1: DPU-7000A Video Processor Standard Set and Accessories

DPU-7000A Front Panel and Functions

Figure 3-1 shows the front panel of the **DPU-7000A** Digital Video Processor. This section describes the functions of the buttons and switches on the front panel.

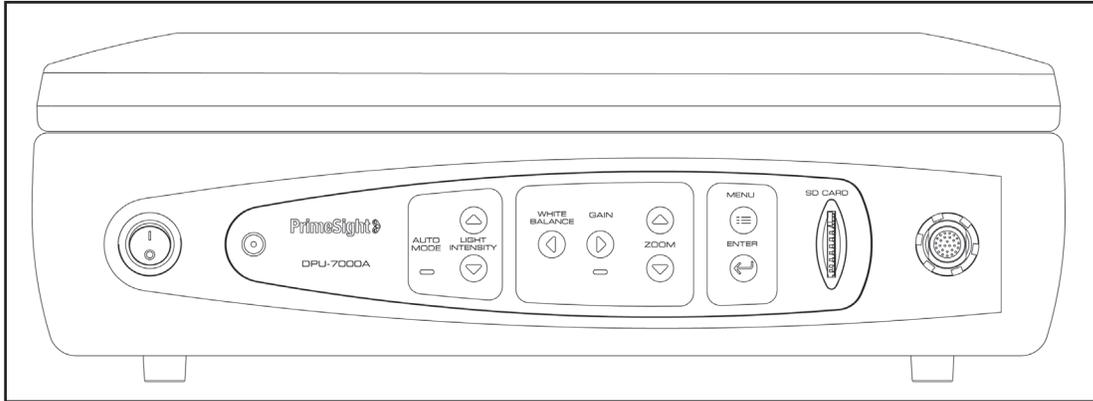


Fig. 3-1: DPU-7000A Front Panel

Power Switch

Press to turn the Video Processor's power on and off.

Light Intensity

The Up and Down arrow buttons are used to adjust the light intensity of the endoscopic image. Refer to Chapter 7, *Adjust the Image Quality*, for more details on this function.

White Balance and Gain Buttons

Press the Left and Right arrow buttons to activate the Video Processor's White Balance and Gain functions, respectively. Refer to Chapter 7, *Adjust the Image Quality*, for more details on these functions.

Zoom and Menu Navigation Buttons

Shared or dual function buttons: the Zoom Up and Down arrow buttons are used to adjust the zoom level of the endoscopic image; when in Menu mode the user can navigate through the on-screen menus using these buttons, and the White Balance and Gain buttons (Left/Right and Up/Down).

Menu

Press this button to display the Main Menu. Press again to turn the menu off or back out of a sub-menu.

Enter

Press this button to confirm a selected menu option.

SD Card Slot

Receptacle for inserting the SD Card memory for saving images, video and user information. Compatible cards are SD (up to 2GB) and high capacity (>2GB) SDHC cards.

Videoscope Connector

Connect the Videoscope Cable’s Plug here.

Auto Mode LED

Automatic illumination control mode status: On / Off. Auto Mode is selected using the Light Intensity controls, and is normally on when the Video Processor is turned on.

Air

Air Connector; connects esophagoscope’s tubing to an Air Pump.

DPU-7000A Rear Panel and Functions

Figures 3-2 and 3-3 below show the rear panel of the **DPU-7000A** Video Processor. The connectors on the rear panel are described in this section.

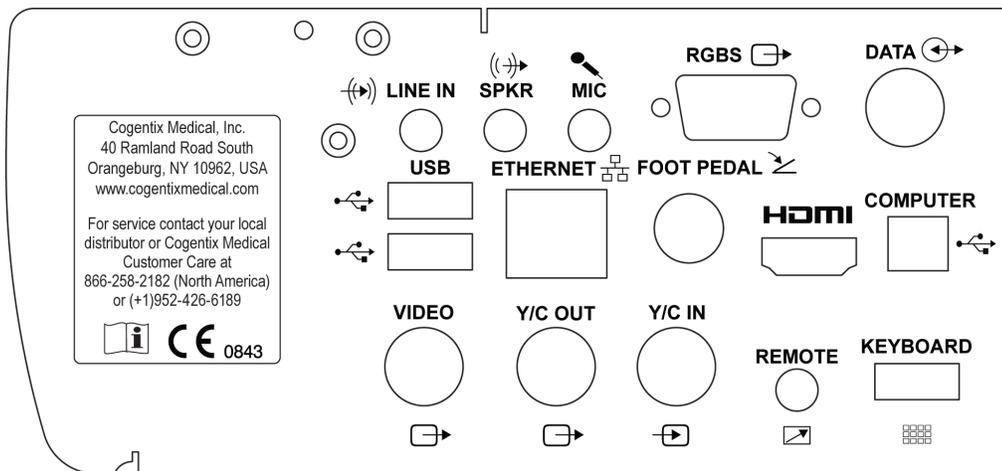


Fig. 3-2: DPU-7000A Rear Panel Left Side

LINE IN

For recording audio from an external line-level source such as the **STR-5000** Stroboscopy Unit.

SPEAKER

For external loudspeakers, headphone or recording device with audio inputs.

MICROPHONE

For using a standard microphone to record audio notes during video capture.

RGBS

For connection to a video monitor with separate Red, Green, Blue and Sync signal inputs with BNC Connectors. The optional RGBS cable is required (Cat. # 07-2063).

Equipment and Functions

DATA

STR-5000 Stroboscopy Unit Data Connection (see "Strobe" for more details).

USB

Two USB 2.0 Connectors; USB connections may be used to power analog speakers with USB power connector or connection to USB printer or hard drive.

Optional USB cable is available (Cat. # 07-5022)

ETHERNET

Not supported; for future use.

FOOT PEDAL

An optional dual foot pedal (Cat. # 07-5020) connected to the Video Processor can activate functions in the same way as the Control Buttons on the connected endoscope.

HDMI

High quality, digital video output; compatible with HDMI digital medical grade monitors.

COMPUTER

For connecting DPU to a computer's USB port to access images stored on an SD card.

VIDEO

BNC type connector for output of a composite-type video signal to a video monitor.

Y/C OUT provides video signal connection to a monitor compatible with Y/C (S-Video) input.

Y/C IN is an analog video input, to replay video from an external source such as a DVD recorder.

REMOTE

This connector can be used to activate external recording or peripheral printing devices that are connected to the Video Processor. The optional Remote Control cable is required (Cat. # 07-2064).

KEYBOARD

Connect an external keyboard here to enable data entry and activation of Video Processor functions.

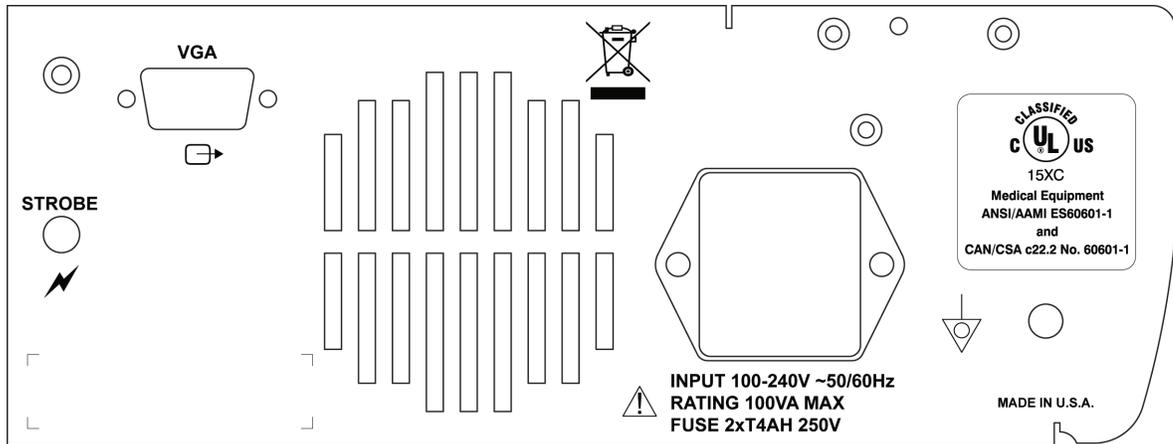


Fig. 3-3: DPU-7000A Rear Panel Right Side

VGA

External monitor interface for monitors with compatible computer type VGA input.

STROBE

The Cogentix Medical **STR-5000** Stroboscopy Unit can be connected to the Video Processor for laryngological endoscopic procedures. Strobed light pulses allow “stop-motion” and “slow-motion” viewing of the vocal folds during these procedures. Data from strobe unit can be displayed on the screen during procedures and recorded as part of the video recording using the Strobe DATA connection.

AC POWER

Connect the power cord from an AC wall outlet here.

EQUIPOTENTIAL STUD

Safety grounding connection for medical facilities requiring equipotential grounding of electrical instruments.

IDENTIFICATION TAG

Identifies the unit’s model number, Cogentix Medical catalog number, and unique serial number.

Compatible Videoscopes

The Cogentix Medical **DPU-7000A** Digital Video Processor is designed to operate with the Cogentix Medical **5000** and **7000 Series** Videoscopes and **DCH-5000** Add-on Camera.

These Videoscopes have the following features:

- A CCD-based imaging system
- An integrated LED illumination system
- Four (4) Control Buttons that can be programmed to activate various Video Processor functions (see Figure 3-4). Programming the buttons is done using the Processor’s Buttons Menu, covered in Chapter 5, *Menus and Sub-Menus*.

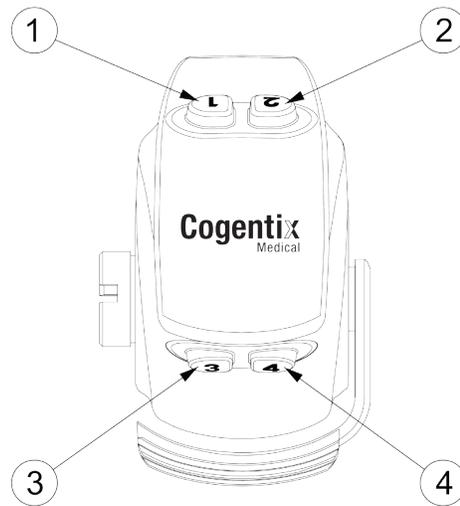


Fig. 3-4: Videoscope Control Buttons

These Control Buttons may be programmed on the Video Processor to perform various user-defined functions such as: Disabled, Enhance, Image Freeze, Gain, Image Capture, Internal/External Video Enable, Light Intensity, Orientation, Pump On/Off, Remote Device, Stop Watch, Strobe On/Off, Video Capture, White Balance, Zoom.

Other cleared videoscopes with some or all of the above features may also be utilized.

Monitor LCD Display

The **DPU-7000A** Digital Video Processor outputs the endoscopic image to the Processor's integrated LCD display.

The **DPU-7000A** model features an integrated "flip-up" LCD monitor display for viewing endoscopic images (see Figure 3-5). The display is always on and features separate controls for the following basic functions:

- **Contrast**
- **Brightness**
- **LCD Menu**
- **Backlight**

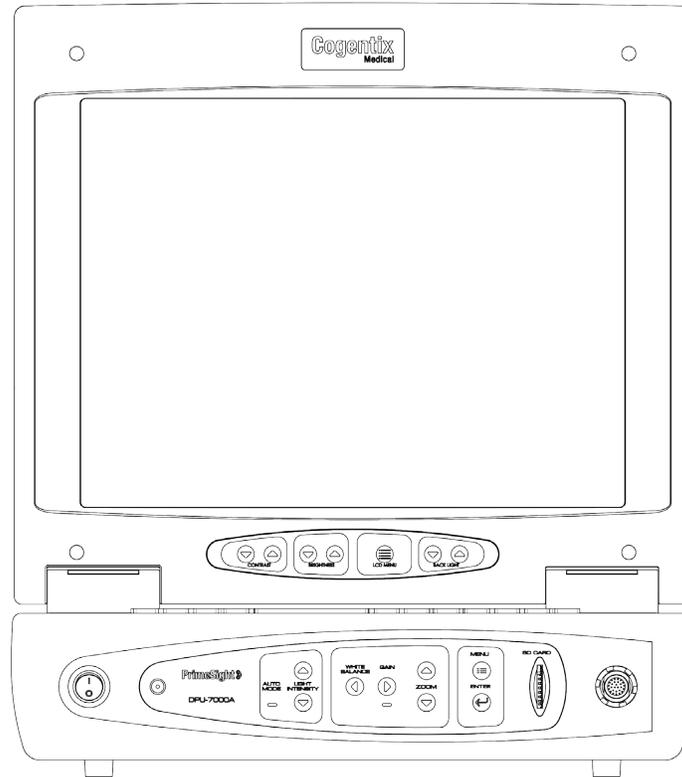


Fig. 3-5: Flip-Up LCD Display on DPU-7000A

The monitor screen displays information in designated areas. These include:

- 1. Endoscopic Image**
- 2. Date and Time**
- 3. Patient Information**
- 4. Drop-Down Menus**
- 5. On-Screen Note**
- 6. Function Icons**
- 7. Function Popup Messages**



NOTE: The LCD monitor for the **DPU-7000A** is set at the factory for optimal viewing. The user should only adjust the LCD monitor's Contrast, Brightness or Backlight settings in the event there is an unsatisfactory image.



Fig. 3-6: Monitor Display (Main Screen with Main Menu)



Fig. 3-7: Monitor Display (with Drop Down Menu)

Screen Structure

The screen is composed of four main areas:

- **Menu Bar:** Top line of screen contains the major menu categories (Fig. 3-6).
- **Drop Down (or Sub) Menus:** When using keyboard cursor/arrow keys to highlight menu heading, sub-menus automatically appear on the screen to provide user with more detailed choices (Fig. 3-7).
- **Programmable Button Display:** Bottom line of screen displays the button number and assigned function of Control Body buttons programmed to activate certain functions. The Programmable Button Display can be turned off in the SCREEN menu.
- **Video Image Field:** Procedural video images occupy the entire LCD screen.

LCD Panel Controls

Display image functions can be modified to adjust aspects of the overall image quality and performance. Some of these functions can be accessed and adjusted through the LCD panel control buttons.

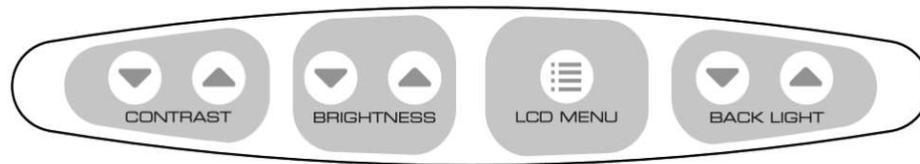


Fig. 3-8: LCD Control Panel

The LCD panel buttons on the **DPU-7000A** Video Processor (directly below the screen) enable users to access the unit's display functionality.

Press these Up and Down arrow buttons to activate functions directly:

- **Contrast**
- **Brightness**
- **Backlight**

Contrast and **Brightness** can also be modified through the **LCD Menu**. The **LCD Menu** button provides access to several display properties, including Contrast, Brightness, Color Tint (Hue and Saturation) and Color Temperature. Refer to Chapter 6, *Operation*, for more details on adjusting image properties through the LCD panel keypad, and for instructions on how to reset to manufacturer default settings.

Accessories



Do not use any accessories that are not in compliance with the equivalent safety requirements of this equipment. Doing so may reduce the operational safety of the system and could cause patient and/or user injury. For all accessories, confirm the safety certifications have been performed in accordance with the appropriate standard (IEC 60601-1 and/or IEC 60601-1-1).

The use of accessories not specified in this manual or sold by Cogentix Medical may result in increased electro-magnetic emissions or decreased immunity of the equipment or system. For advice on compatibility, contact your distributor or Cogentix Medical Customer Service Dept.

4 Preparation and Inspection

CAUTION

Do not use the Video Processor if inspection reveals that the unit is not functioning properly or has any defects. Continued use of such a unit may impair its long-term operability and could cause patient and/or operator injury.

To prevent electric shock, connect the power cords of any non-medical grade peripheral equipment through medical isolation transformers.

Confirm that all other devices used in conjunction with the **DPU-7000 Series** Digital Video Processors are compatible with the Video Processors and are functioning properly. If any component of the endoscopic system is not functioning properly, do not perform the procedure.

Select an Installation Site

It is important to select an appropriate location in which to install the Video Processor.

- Place the Video Processor on a stable rigid surface such as a cart, countertop, or solid stand.
- The location must not contain explosive or flammable gases.
- Place the Video Processor away from radios, televisions, cell phones, or any other devices that emit electromagnetic energy. These can interfere with proper operation. Avoid stacking the Video Processor on other equipment to avoid possible electromagnetic interference.
- Place the Video Processor in a dry place, and avoid contact with liquids.
- Do not allow the Video Processor's vents to be obstructed; full ventilation is necessary for proper operation. Vents are located on the bottom and back of the unit.

Connect the Videoscope to the Processor

CAUTION

Do not connect or disconnect the Videoscope Cable Plug while the Video Processor's power is on. It may cause severe and irreversible equipment damage.

When attaching the Videoscope Cable Plug to or removing it from the Video Processor, always grasp the plug. Attachment or removal while holding the cable itself could damage the cable.

Preparation and Inspection

To connect a Videoscope to the **DPU-7000 Series** Digital Video Processors:

Remove the sealing cap, if installed, from the end of the plug by gently pulling back on the body of the plug while holding the strain relief on the video cable.

Insert the videoscope cable plug into the DPU connector on the Video Processor with the orientation arrow facing up, as shown in Figure 4-1.

Gently push the Connector into the Video Processor's front panel connector until it stops. (This is designed to be a very snug fit.)



Fig. 4-1: Connect the Videoscope Cable to the Video Processor

Connect Peripheral Equipment

The **DPU-7000A** Digital Video Processor can be connected to a variety of peripheral equipment via the rear-panel connectors:

- External Monitor
 - Y/C (S-Video)
 - Composite Video
 - RGBS
 - HDMI
 - VGA
- Video Recorder
 - Y/C
- Video Printer
- Keyboard
- USB Printer

- Foot Pedal
- Stroboscopic Unit (STR-5000)
- USB Storage devices (USB 2.0 Hard Disk or Flash Memory Stick)

Peripheral video recorders can be connected to both the **Y/C Out** and **Y/C In** connectors to allow both recording and playback viewing on the **DPU-7000A** video processor using the integrated LCD monitor.

When using an isolation transformer for any peripheral equipment, ensure that the power requirements of the equipment do not exceed the capacity of the isolation transformer. For further information, contact your local Cogentix Medical representative.

Cables

Always attach cables to the rear panel of the Video Processor first, and then connect them to the peripheral equipment.

Below is a list of the cables that are available for the **DPU-7000 Series** Digital Video Processors (the Y/C Video Cable and Composite Cable are included with the **DPU-7000A** Digital Video Processor). Only use the approved cables listed below to avoid electromagnetic interference. Refer to Table 3-1 for cable descriptions.

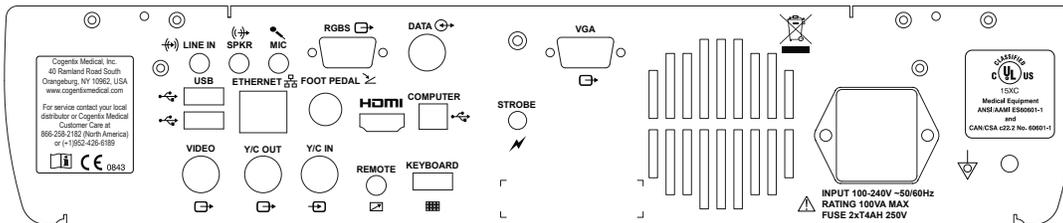


Fig. 4-2: Rear Panel Cable Connections

Cable	Catalog No.:
Y/C Video	07-2060
Remote Control	07-2064
External Keyboard	07-7023
Strobe Data	07-5076
HDMI to HDMI	07-7020
RGBS	07-2063
Composite Video	07-2062
USB A to USB B	07-5022
VGA Video	07-7024
HDMI to DVI	07-7021
Audio for STR-5000	07-7027
USB A to USB A	07-7022
7000 Series Cable Pack	07-7025

Connect an AC Power Cable

Compare the standard power plug configurations that are used in your country to those shown in Figure 4-3 below to make sure that you have the correct one. If the appropriate power cord is not included with your product, contact your local Cogentix Medical distributor.

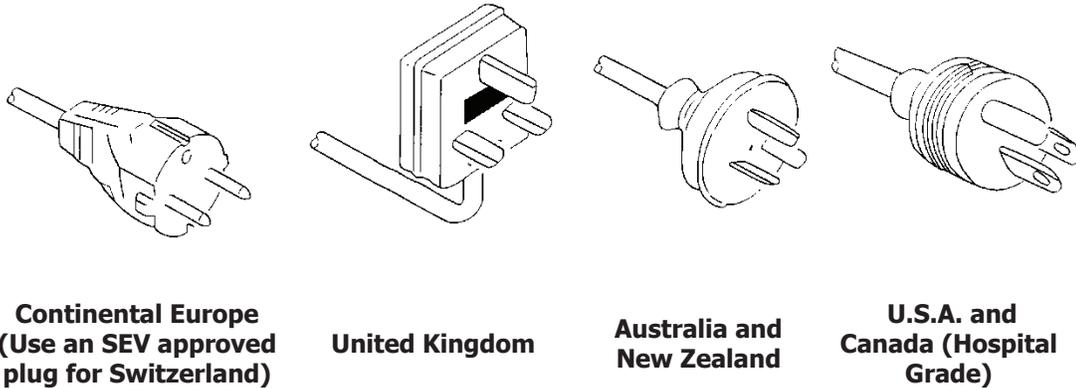


Fig. 4-3: AC Power Cable Connectors

Connect the Cable

Make sure that the main power switch to the unit is **OFF** before connecting the power cable.

To connect the power cable to the **DPU-7000 Series** Digital Video Processor:

- Connect the supplied power cable into the three-prong inlet on the rear panel of the **DPU-7000 Series** Digital Video Processor.
- Plug the other end into an AC wall outlet.

All equipment must be properly grounded. It should be connected to a three (3)-prong hospital-grade receptacle in the U.S.A. or Canada. Ensure that all power requirements are met and comply with those specified on the rating located on the Processor's rear panel.

Connect to the Air Pump

Users of the **DPU-7000A** Video Processor can connect to the integrated air pump in this unit for use during transnasal esophagoscopy (TNE) procedures. Connect the TNE air tubing to the Video Processor's **AIR** fitting, shown in Figure 4-4.

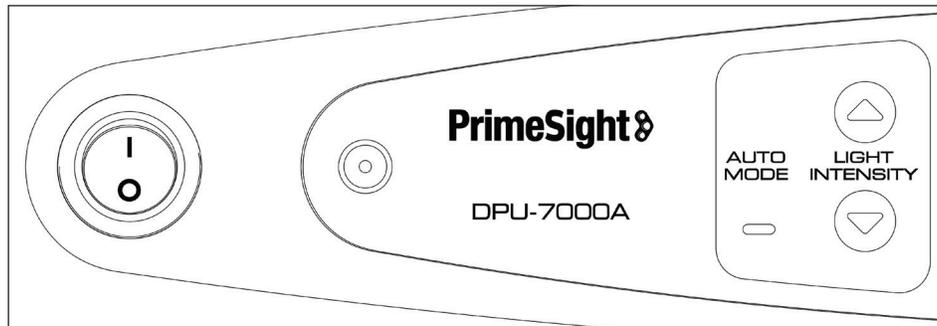


Fig. 4-4: Connect Tubing to the Processor's Air Pump

Inspect the Assembled System

Before performing the procedure, thoroughly inspect the system.

- Confirm that all cords and cables are connected properly and are secure.
- Confirm that the equipment and all components function properly, including all switches, indicators, etc.

Turn On the Video Processor

After the system has been fully assembled and all connections made as described above, power on the **DPU-7000A** Digital Video Processor.



NOTE: Wait until the Main Screen is displayed on the video monitor before changing any settings.

5 Menus and Sub-Menus

The Main Menu provides access to all of the Video Processor's settings and functions. Access can be obtained via the buttons on the Video Processor's front panel or the keyboard.

Navigating the Menu System

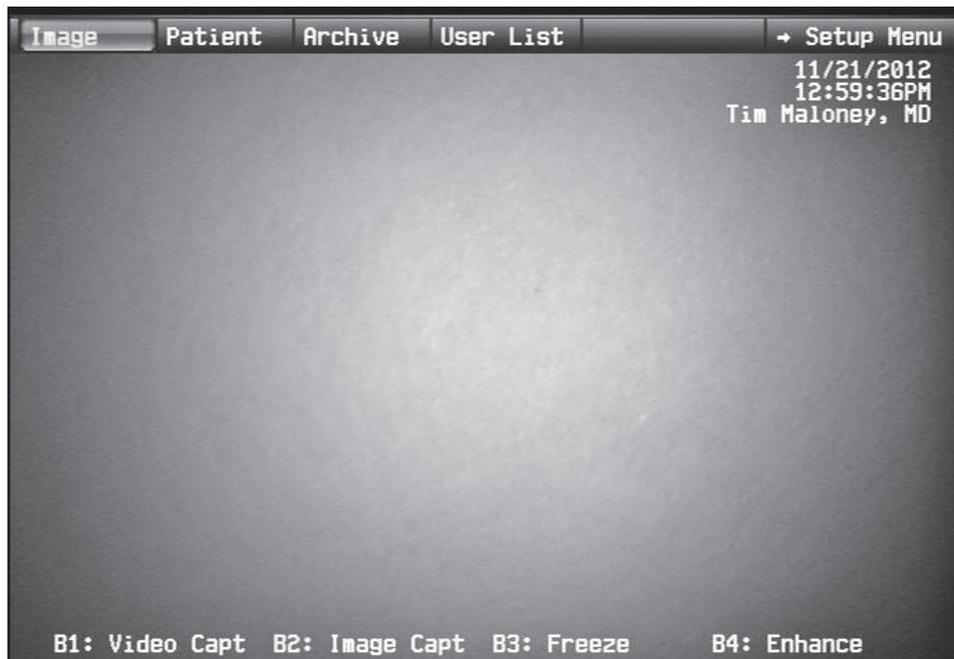


Fig. 5-1: Main Menu Display

This section provides basic instructions on how to navigate through the Video Processor's system of menus and sub-menus. Five top level menu headings feature a progression of linked sub-menu functions, allowing users to select settings and customize various options.

Main Menu

The five main menu headings represent high level functions relevant to the user, the patient, and image display and management features. Each menu category and its associated submenu settings and options are described in this chapter.

IMAGE	PATIENT	ARCHIVE	USER LIST	SETUP
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Accessing the Main Menu

The Main Menu is brought up by pressing the Menu button either on the built-in keyboard or the front panel keypad. The Main Menu is displayed on-screen. The blue bar highlights the selected menu option.

- While in Menu mode, pressing Menu will exit the Menu.
- Pressing Esc while in Menu mode will go to the previous Menu level.
- Pressing Esc when on the top level Menu line will exit Menu mode.
- When in a function branched from the Main Menu, pressing Esc will move to the Main Menu line.
- Location in Menu will be the last location when the user left the Menu.

To Navigate Menus and Sub-Menus

Cursor keys (Up/Down/Left/Right) on the keyboard and the front panel can be used to move through the menus and change settings. These navigation keys have dual functions; when the menu is displayed the arrow keys move up and down through the menu selections. When not in menu mode, pressing the key will activate the second function assigned to the key.

- On the Front Panel, the Zoom Up and Down buttons will either increase or decrease the zoom on the video image when not in menu mode, or when a menu is displayed, will move the cursor up and down through the menu options.
- The Front Panel White Balance button is a left directional cursor key when in menu mode. Pressing the White Balance button also activates this function prior to the start of each procedure.
- The Front Panel Gain button is a right directional cursor key when in menu mode. Pressing the Gain button will also activate this function during a procedure.
- On the Keyboard, the Air key is a left directional cursor key. This key will also activate the Air function during a procedure.
- On the Keyboard, the White Balance key is a right directional cursor key when in menu mode. Pressing the White Balance key prior to a procedure will activate this function.
- On the Keyboard, the Image Orient key will move the cursor key down when in menu mode. Pressing this key during a procedure will change the orientation of the current displayed image (normal or flipped).
- On the Keyboard, the cursor up/arrow up key will move the cursor up when in menu mode.
- Press the Menu key on the keyboard or the Menu button on the front panel to display the main menu.
- Press the Up or Down Cursor/Arrow (↑ or ↓) buttons on the keyboard to highlight the menu option immediately above or below the current one.

- Press the Left or Right Cursor/Arrow (← or →) buttons on the keyboard to move to the left or right.
- Press the ENTER key to select the highlighted menu option and turn off the sub-menu.
- Press the MENU key on the keyboard to immediately exit the menu.
- Press the ESC key on the keyboard or the Menu button on the front panel to back out of a menu one level at a time.

The first menu heading is **Image**. The sub-menu options branching from the main **Image** menu are listed and described here.

IMAGE PATIENT ARCHIVE USER LIST SETUP



Image drop-down menu



Fig. 5-2: Image Sub-Menu

Image Sub-Menu

The Video Processor's **Image** menu options are described in Table 5-1 below:

Function	Options
Enhance	Adjust the sharpness enhancement level of the picture, select from four levels: Off, Low, Medium, High
Light Intensity	Select the videoscope's illumination intensity, levels 1 through 8, or Auto mode
Brightness	Adjust the image brightness level, -5 through +5
Gain	Turn on or off the Gain function for low light compensation
Orientation	Flip image display (Range: Normal or Flipped)
Zoom	Zoom in on the image up to twice the original size; select from 1.0 through 2.0 (zoom range = 1.0X to 2.0X in steps of 0.1). System can show or hide zoom level indication; when zoom is at level 1, no indication is shown regardless of setting.
Peak/Ave	Select the weight of peak vs. average intensity (adjust exposure between peak and average) when adjusting automatic exposure control. Selections are 10/90, 20/80, 30/70, 40/60, 50/50, 60/40, 70/30, 80/20, 90/10.
Shutter Window	Select the shutter window size; range = Small, Medium, Full
Shutter Speed	Select the shutter speed, options are Automatic, Maximum, 1/100, 1/250, 1/500, 1/1000, 1/2500, 1/5000, 1/10000, 1/25000, 1/50000, 1/100000.
Color Red	Adjust red color; range = -5 to +5
Color Blue	Adjust blue color; range = -5 to +5
Color Intensity	Adjust color intensity; range = -5 to +5

Table 5-1: Image Sub-Menu

Refer to Chapter 7, *Adjust the Image Quality*, for a more complete explanation of each of these image adjustment features.

The second menu heading is **Patient**. The sub-menu options branching from the main **Patient** menu are listed and described here.



Patient drop-down menu

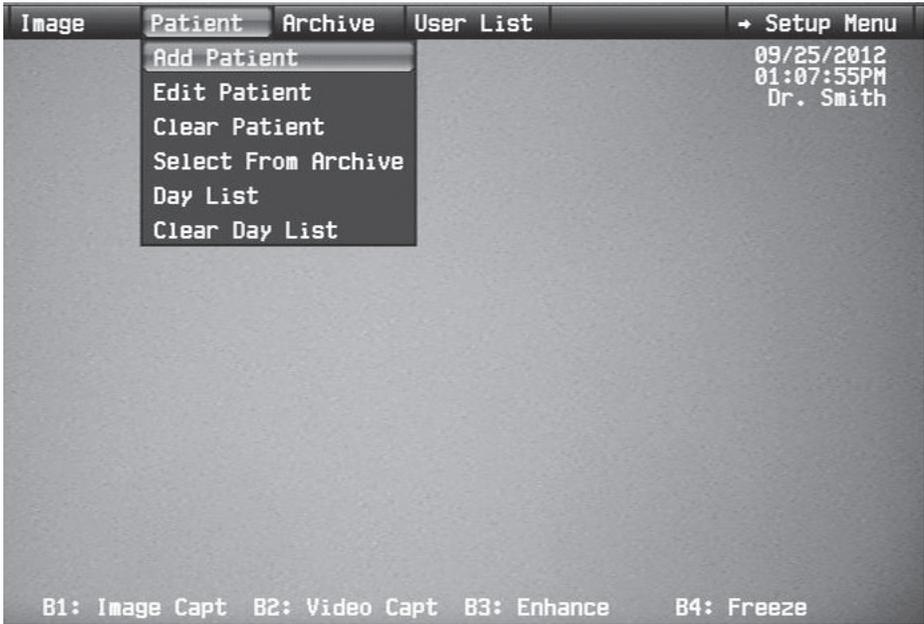


Fig. 5-3: Patient Sub-Menu

Patient Sub-Menu

The Video Processor’s **Patient** menu options are described in Table 5-2 below:

Function	Options
Add Patient	Add New Patient (opens entry screen to input a new patient, automatically added to archive)
Edit Patient	Open patient entry screen to edit the current patient information
Clear Patient	Clears current patient information indicated at top of screen
Select from Archive	Access archive storage for selecting a patient. The list of patients in the archive may be browsed, sorted or filtered based on ID, last name or date of birth.
Day List	Displays list for max. 15 patients for the day. If user advances selection to an empty entry line, then presses Enter, a new screen appears to allow a search for patients from the Archive.
Clear Day List	Clears current Day List displayed

Table 5-2: Patient Sub-Menu

Menus and Sub-Menus

- Pressing Enter on ADD PATIENT brings up an entry screen to input new patient information, which is automatically added to the Archive:



Fig. 5-4 (a) and (b): Add Patient Function and Patient Info Entry Screen

Patient Information / Data Fields

Nine fields on the display are available for the entry of patient information. Use the tab key to move through the patient information entry fields. To store patient images, the user will need to input the patient's ID #, first and last name, and date of birth at a minimum.

ID

Enter up to 15 alphanumeric characters as a unique identifier for the patient (**Note:** Be careful when entering patient ID, this cannot be changed in Edit Patient mode after it is created for the patient.)

First Name

Enter up to 15 alpha characters for a patient's first name

Middle Name

Enter up to 15 alpha characters for a patient's middle name

Last Name

Enter up to 20 alpha characters for a patient's last name

Title

Enter Mr., Mrs., Ms., etc. as a prefix to the patient's name

Suffix

Enter Jr., Sr., or other suffix if appropriate for the patient's name

Date of Birth (DOB)

Enter the patient's date of birth

Gender

Enter the appropriate character (M/F/O) for the patient's gender (Male/Female/Other)

Note

The user may enter patient-specific information in this field (medical history, recent diagnosis, or other pertinent or useful notes)

Once the Add Patient screen is completed and the user selects OK to save the patient to the Archive, a Notification screen will appear:

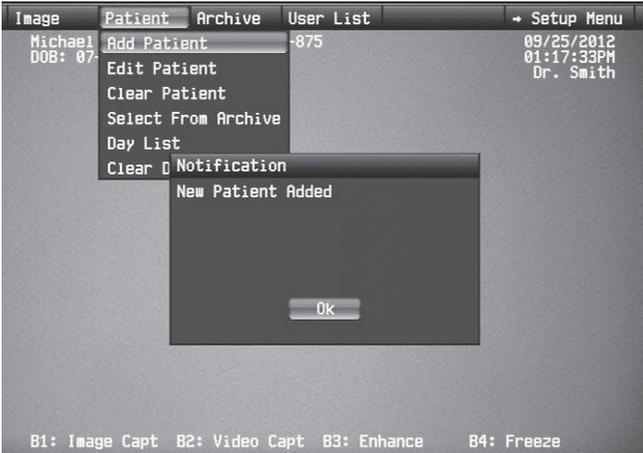


Fig. 5-5: Confirmation New Patient Added

Patient Data Management

The **Edit Patient** function opens the patient detail screen to edit the current patient information.

Selecting **Clear Patient** will clear the patient information at the top of the screen.

The **Select from Archive** feature enables the user to bring up a list of patients currently stored in the Archive and highlight/select a patient on that list.

The **Day List** feature enables the user to create a list of patients scheduled for procedures on a particular day.

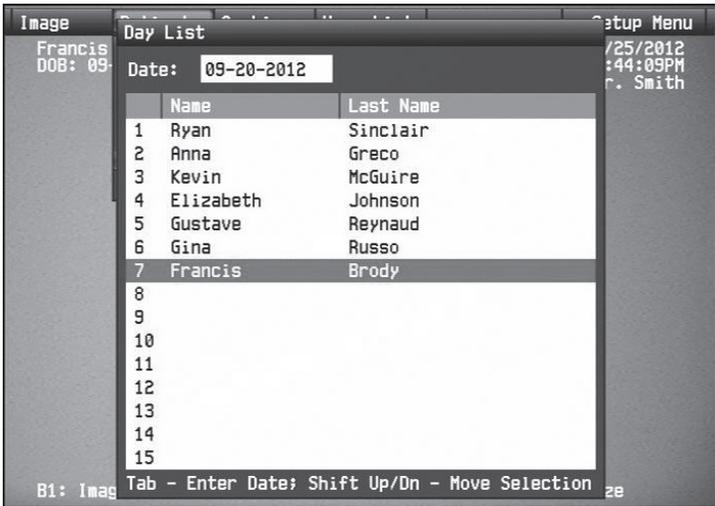


Fig. 5-6: Patient Day List

Menus and Sub-Menus



NOTE: To change the order of patients in the **Day List**, hold down the Shift key and use the Up or Down arrow keys simultaneously to move patients within the Day List. Shift and Delete key will delete the patient from the Day List.

Clear Day List will delete the entire Day List currently displayed on screen.

The third menu heading is **Archive**. The sub-menu options branching from the main **Archive** menu are listed and described here.

IMAGE PATIENT ARCHIVE USER LIST SETUP



Archive drop-down menu

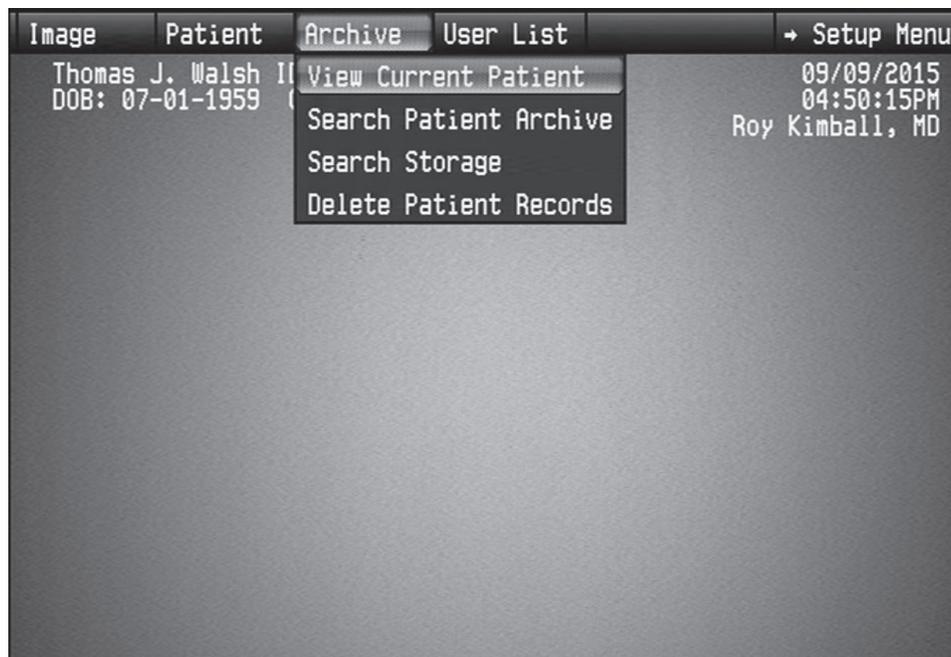


Fig. 5-7: Archive Sub-Menu

Archive Sub-Menu

The Video Processor's **Archive** menu options are described in Table 5-3 below:

Function	Options
View Current Patient	Displays list of images and video clips for current patient
Search Patient Archive	Browse or search Archive by patient name, ID or DOB
Search Storage	Enables user to search SD card or USB backup for patient folders
Delete Archive Field	Removes selected patient record from Archive database (no files deleted from SD card)

Table 5-3: Archive Sub-Menu

Pressing Enter on VIEW CURRENT PATIENT brings up a list of stored images and video clips for the current patient.

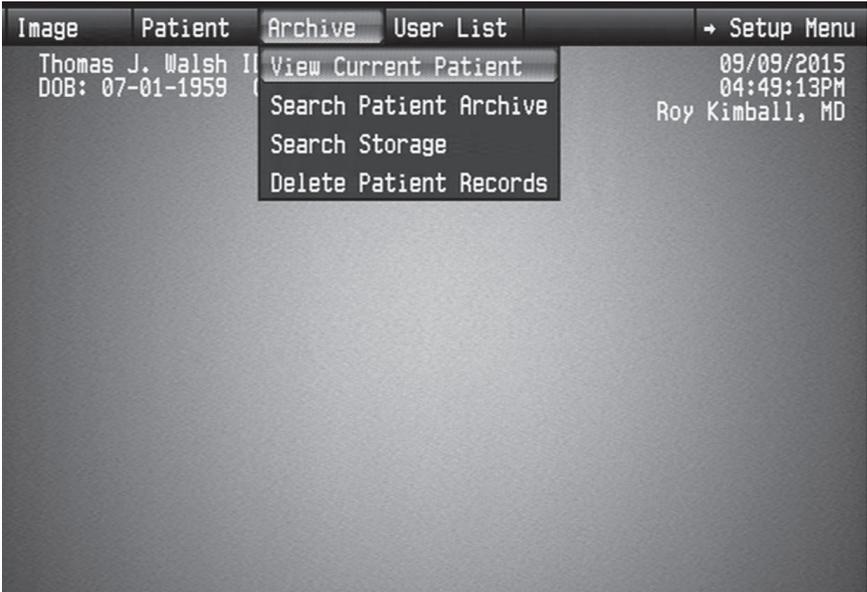


Fig. 5-8: View Current Patient Images

Once a patient is selected, a list of files for still images and video clips is displayed. When the user presses Enter, the image or video is displayed. Pressing up and down arrows will move to the next image/video. Pressing Esc will return to the list of files. When still image or video clip is displayed, the file name is shown in the bottom left area of the screen.

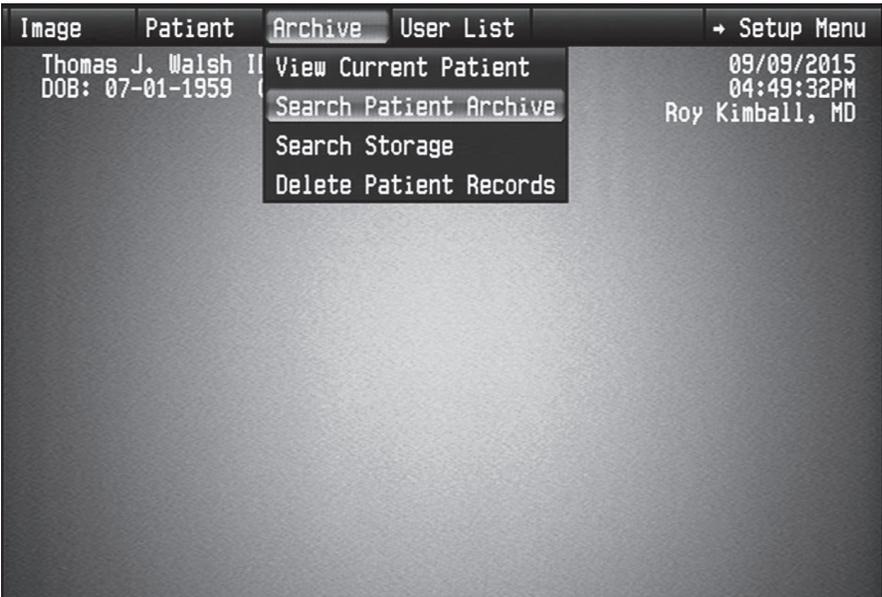


Fig. 5-9: Search Patient Archive

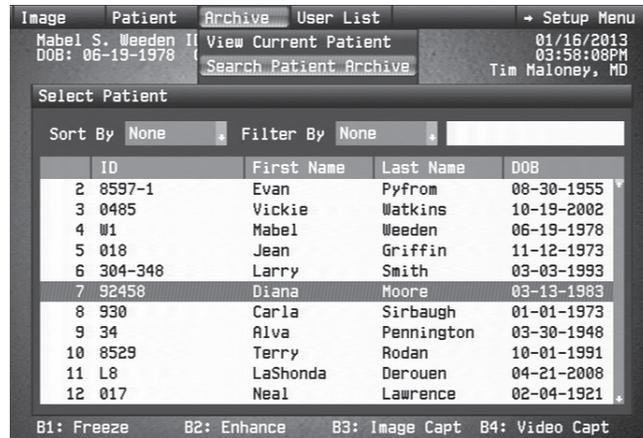


Fig. 5-10: Patient Archive Screen

Search from Patient Archive enables the user to browse the list of patients or search for patients by using the patient's name, the patient's ID number, or their Date of Birth. Use the Tab key to move between the Sort By, Filter By, and Patient List fields. In search mode users can sort by patients dates of birth, either ascending dates (DOB Up) or descending dates (DOB Down). This can be saved as a preferred default search setting by saving user settings.

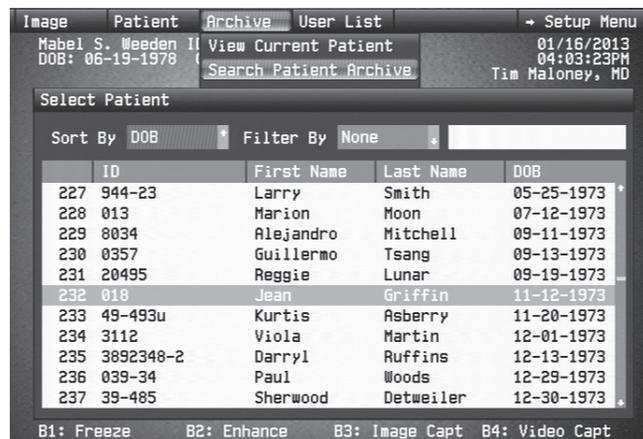


Fig. 5-11: Sort Patient Archive by Date of Birth

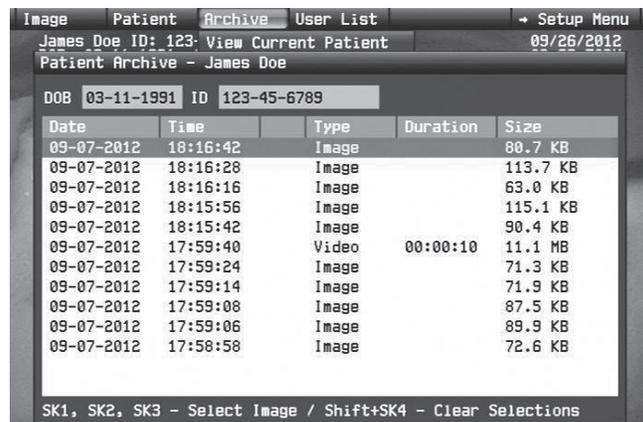


Fig. 5-12: Archive List Video/Image by Patient

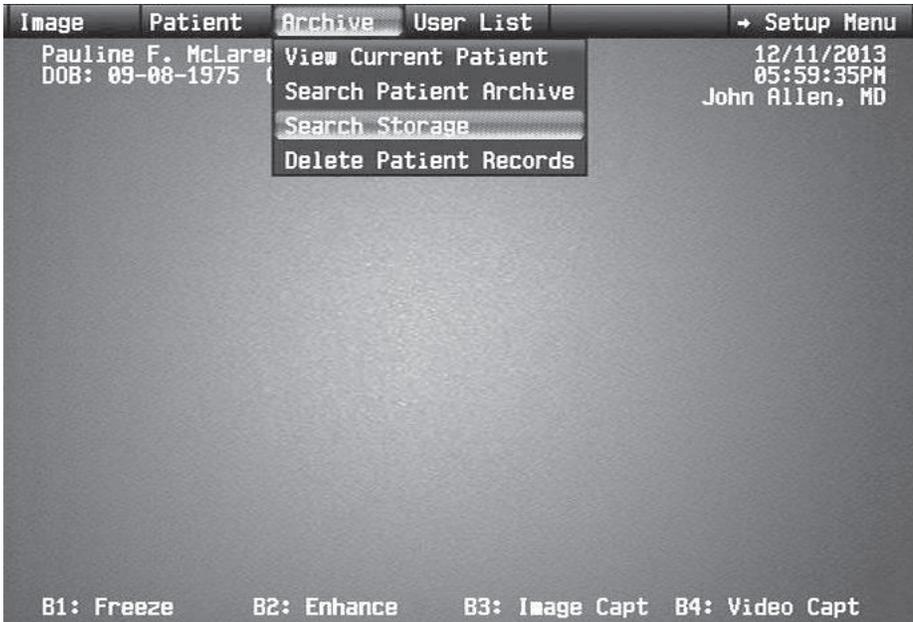


Fig. 5-13: Search Storage Function

Search Storage enables the user to switch the selection for the device to be searched by the system, between SD Card and USB storage device. When **Search Storage** is selected, the next screen features a Media field; use the Tab key to highlight Media, and the Up and Down arrow keys to change the media to be searched. This feature allows the user to look at all patient folders on an SD card or USB device, including patient files created on a different unit.

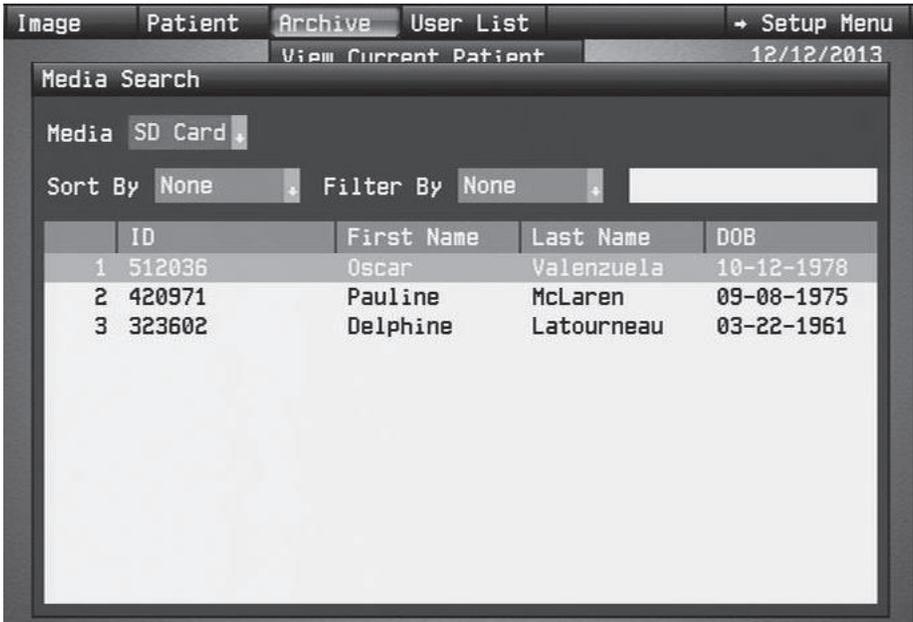


Fig. 5-14: Media Search Sub-Menu

Menus and Sub-Menus

The fourth menu heading is **User List**. The sub-menu options branching from the main **User List** menu are listed and described here. The User List displays a menu of up to 15 users, each with stored settings for image management.

IMAGE PATIENT ARCHIVE USER LIST SETUP



User List drop-down menu

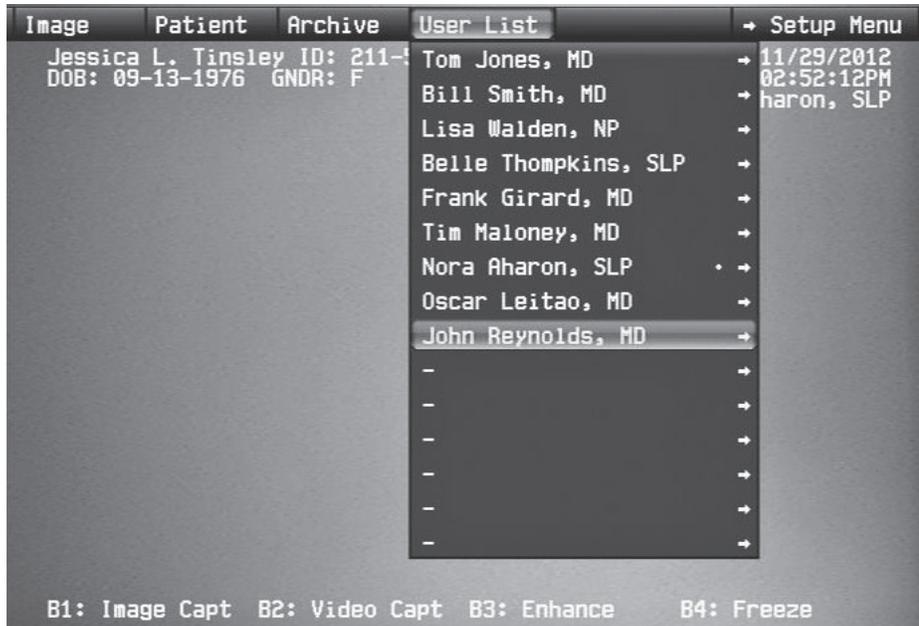


Fig. 5-15: User List

User List Sub-Menu

The Video Processor's **User List** menu options are described in Table 5-4 below:

Function	Options
Select User as Active	Highlight user name on the User List, and press Enter; this will display sub-menu selection <i>Select User as Active</i> . Pressing Enter again will load user settings.
Change User Name	Sub-menu selection required when changing users.
Save Current Settings to Active User	When changing settings, pressing Enter on this sub-menu selection will save changes to user profile.
Clear User	Deletes the user from the list; resets settings to factory default.
Display Settings	Pressing Enter on this sub-menu selection will display current user's stored settings.

Table 5-4: User List Sub-Menu

Each physician or clinical practitioner using the Video Processor will enter their name in the User List prior to selecting settings or image management preferences through the menu system. These selections will automatically be restored for each user when their profile is selected.

Add New User / Change User

To add a new user to the system, select **Change User Name** from the drop-down menu. This brings up a list of current users; simply cursor down to the first blank line and enter the user’s name. Highlight **Select User as Active** (and press Enter) when changing users on the system.

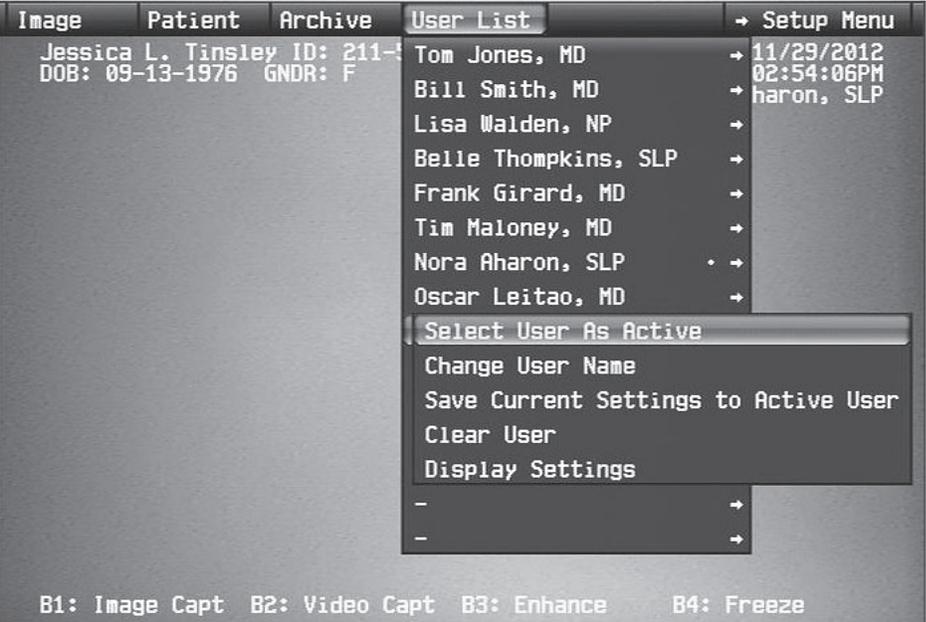


Fig. 5-16: User List Sub-Menu



NOTE: When changes are made to user settings, if the user wants the updated settings to be saved permanently to their user profile, it is necessary to select **Save Current Settings to Active User** from the User List menu. Otherwise, when the DPU is turned off, the system will revert to the previously stored settings.

Menus and Sub-Menus

The fifth main menu heading is **Setup**. The menu options branching from the main **Setup** menu are listed and described here.



Press enter on **SETUP** menu →

to access ↓ this series of features:

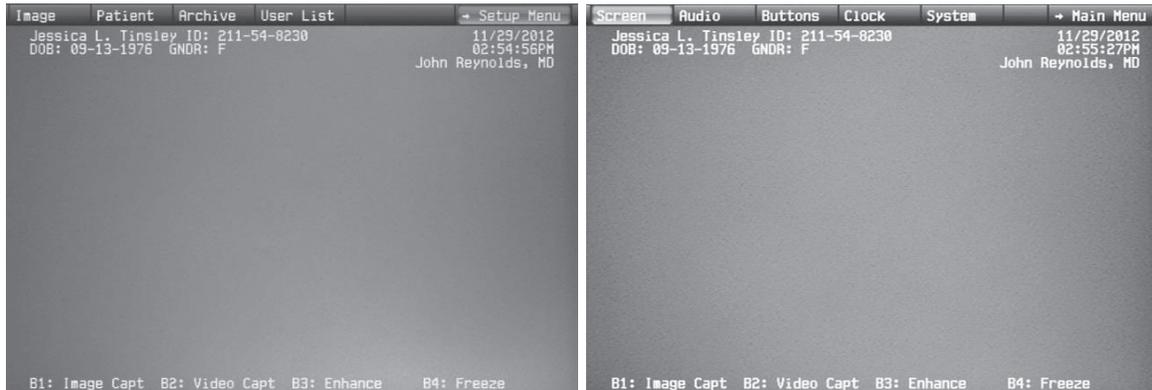


Fig. 5-17 (a) and (b): Setup Menu Selection and Setup Menu

Setup Menu

The Video Processor's **Setup** menu options are described in Table 5-5 below:

Function	Options
Screen	Display Patient Data, Clock, User, Zoom, Orientation, Strobe Data, Buttons and On-Screen Note all have the option of Off or On. PIP Location, Freeze Mode and Enter On Screen Note require different selections or entries.
Audio	Adjust volume, or enable key click sound
Buttons	The button setting menu is used to program the functions of the buttons on the videoscope handle, add-on camera head, or foot pedals. Each button can be assigned to one of the following: Disabled, Enhance, Freeze, Gain, Image Capture, Light Intensity, Internal/External Video Enable, Orientation, Pump On/Off, Remote, Peak/Average, Strobe On/Off, Video Capture, White Balance, Zoom.
Clock	Set the date and time and choose format for display. Stop Watch is also activated from this menu.
System	Enables selection of printer setup and language; backup/restore system information or patient files; selection of maintenance functions; displays system information.

Table 5-5: Setup Sub-Menu

The first menu heading which is accessed by pressing Enter on the **Setup** menu is **Screen**. The sub-menu options branching from the **Screen** menu are listed and described here.

SCREEN AUDIO BUTTONS CLOCK SYSTEM



Screen drop-down menu

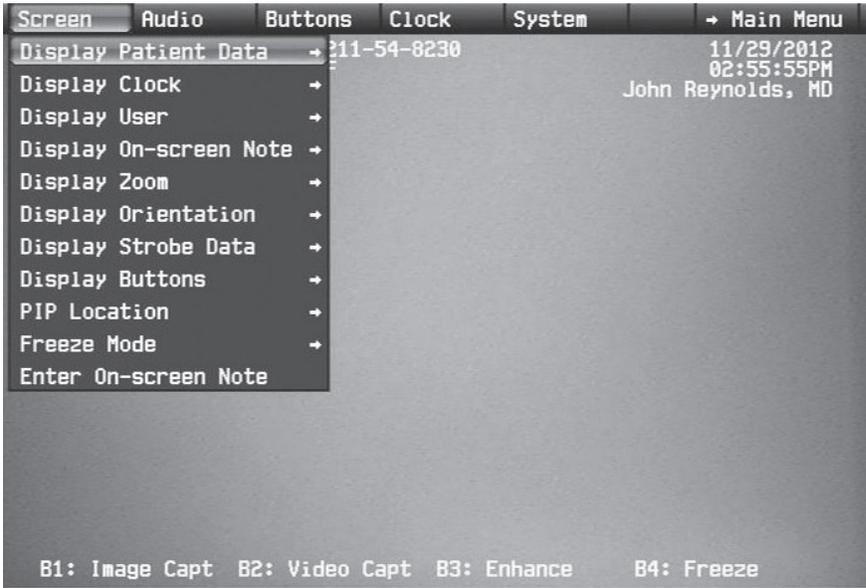


Fig. 5-18: Screen Sub-Menu

Screen Sub-Menu

The Video Processor’s **Screen** menu options are described in Table 5-6 below:

Function	Options
Display Patient Data	Choose the patient data to display: All, Name and ID, Name and DOB, Name Only, ID Only or None.
Display Clock	Select On or Off
Display User	Select On or Off
Display On-Screen Note	Select On or Off
Display Zoom	Select On or Off
Display Orientation	Select On or Off
Display Strobe Data	Select On or Off
Display Buttons	Select On or Off
PIP Location	Upper Right, Middle Right, Lower Right, or Upper Left, Middle Left, Lower Left

Menus and Sub-Menus

Function	Options
Freeze Mode	Freeze Field or Freeze Frame
Enter On Screen Note	User may enter 2 lines of on-screen notes in this window

Table 5-6: Screen Sub-Menu

Display Clock, Display User, Display Zoom, Display Orientation, Display Strobe Data, Display Buttons, and Display On-Screen Note are all selections for which the user chooses either **On** or **Off**.

Display Patient Data, PIP Location, Freeze Mode, and Enter On-Screen Note are all functions which require the user to choose from the option list (or enter text).

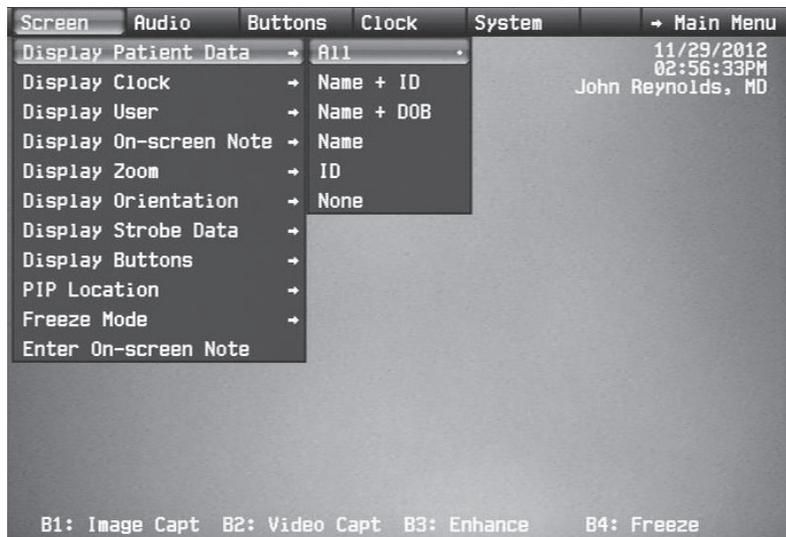


Fig. 5-19: Display Patient Data Options

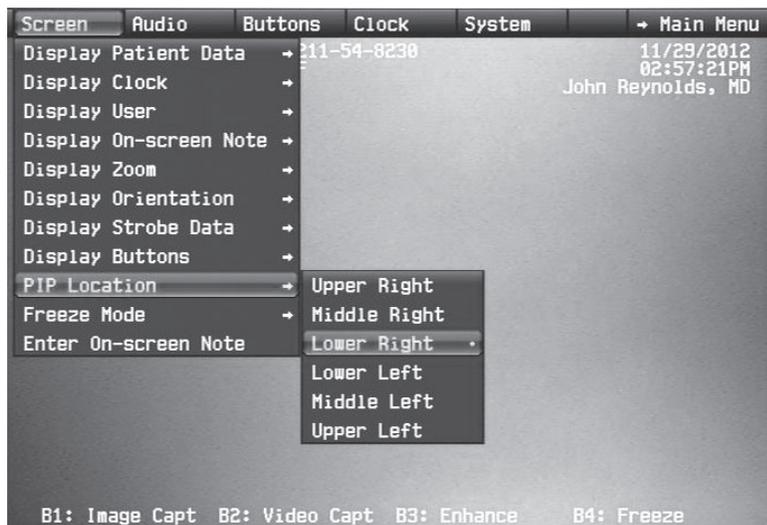


Fig. 5-20: PIP Location Options

(Screen Sub-Menu Continued)

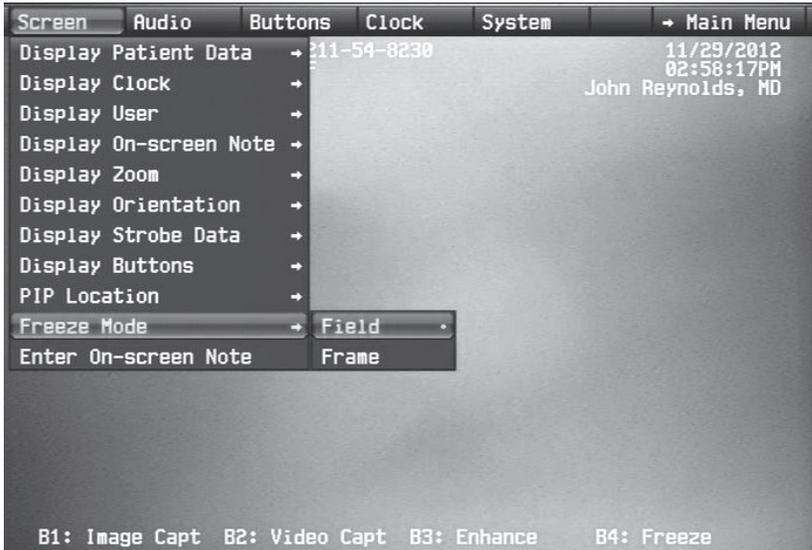


Fig. 5-21: Freeze Mode Options

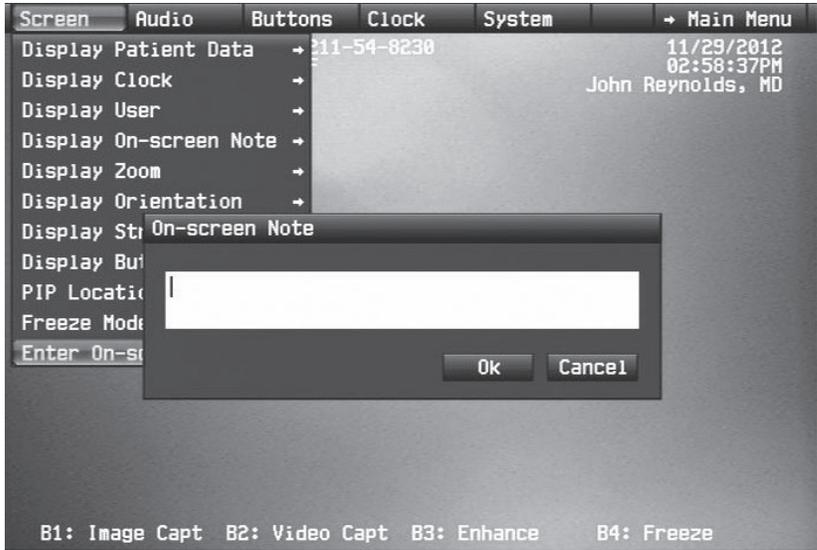


Fig. 5-22: Enter On-Screen Note



NOTE: If the user wishes to save changes for display settings or save an on-screen note permanently to their user profile, it is necessary to select **Save Current Settings to Active User** from the User List menu. Otherwise, when the DPU is turned off, the note will not be saved and system will revert to previously stored settings.

Menus and Sub-Menus

The second menu heading (accessed by pressing Enter on the **Setup** menu) is **Audio**. The sub-menu options branching from the **Audio** menu are listed and described here.



Audio drop-down menu

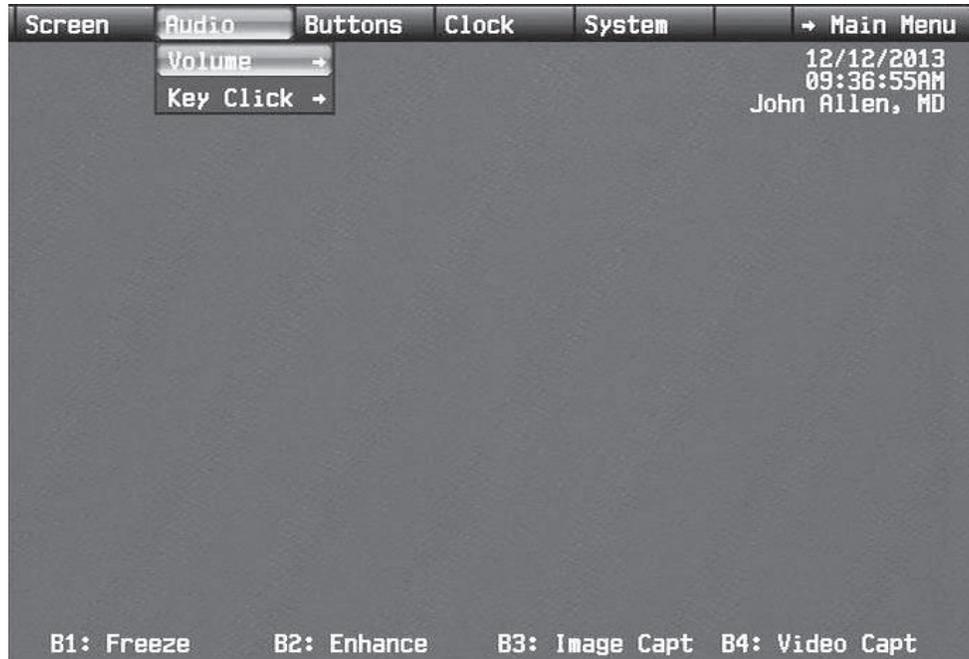


Fig. 5-23: Audio Sub-Menu

Audio Sub-Menu

The Video Processor's Audio menu options are described in Table 5-7 below:

Function	Options
Volume	Adjusts volume; range is 1 to 10
Key Click	Set key click sound to be On or Off

Table 5-7: Audio Sub-Menu

(Audio Sub-Menu Continued)

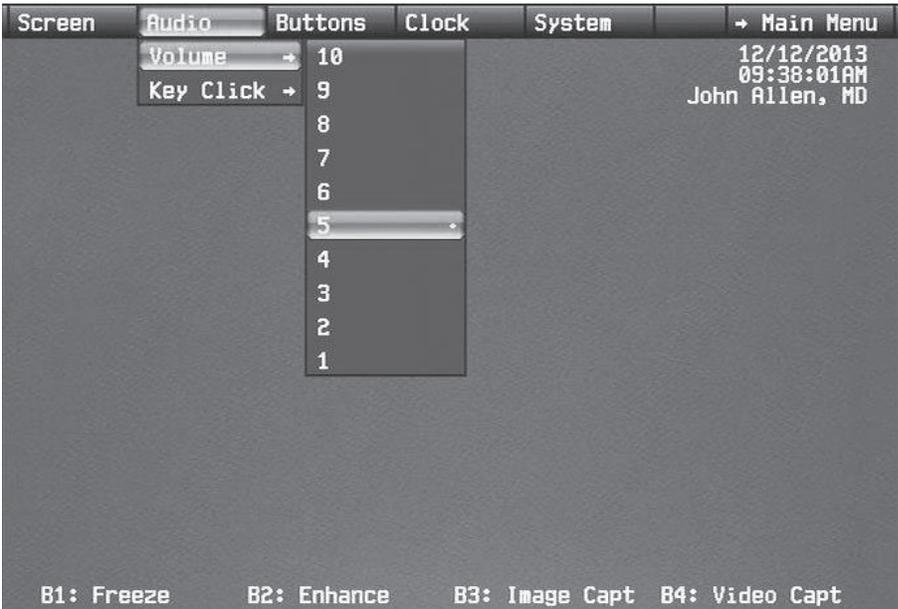


Fig. 5-24: Volume Options

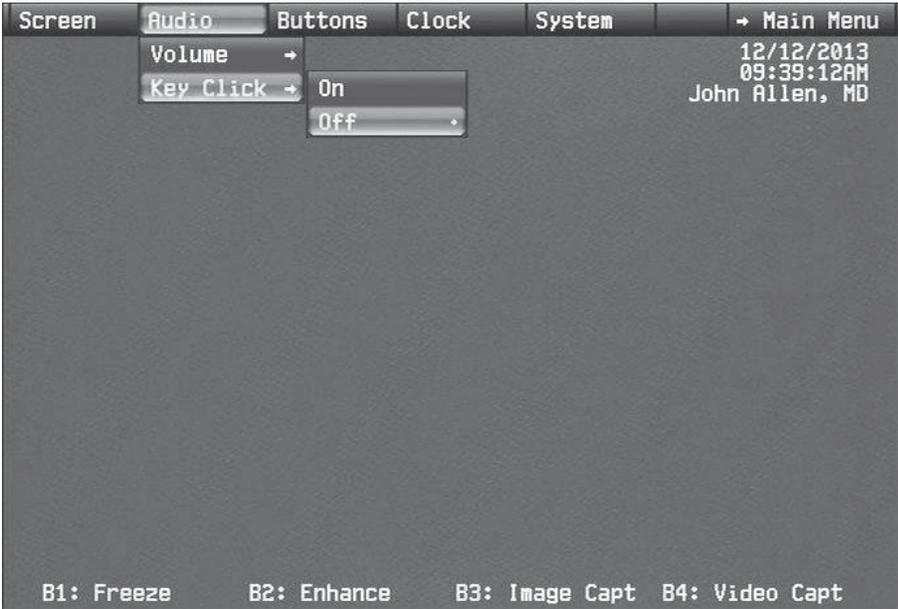


Fig. 5-25: Key Click Options

Menus and Sub-Menus

The third menu heading (accessed by pressing Enter on the **Setup** menu) is **Buttons**. The sub-menu options branching from the **Buttons** menu, and associated programmable function choices are described here.

SCREEN AUDIO BUTTONS CLOCK SYSTEM



Button drop-down menu

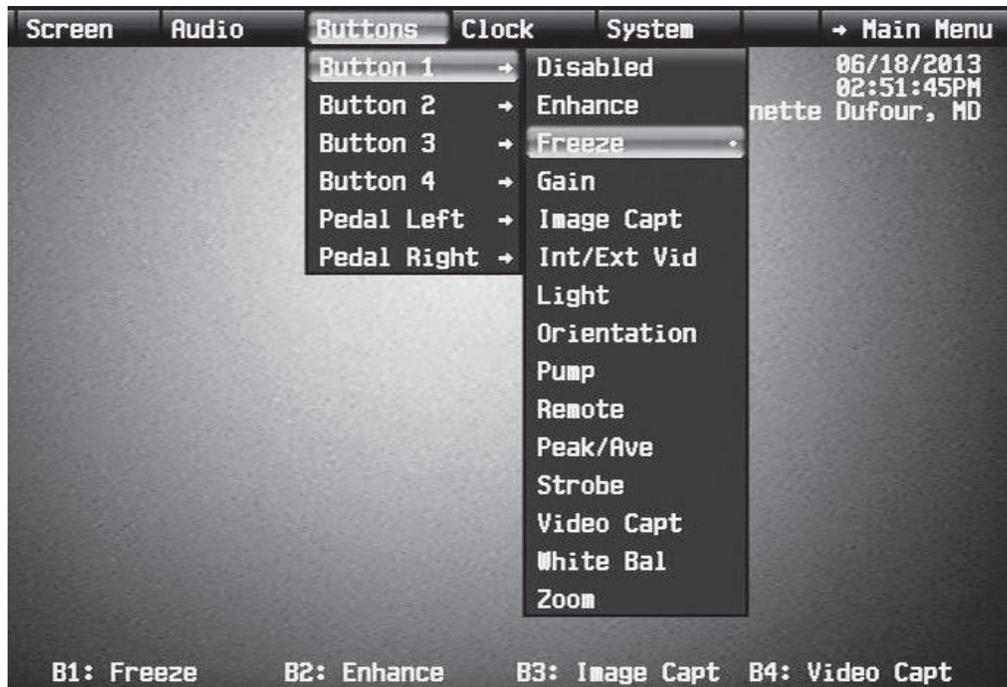


Fig. 5-26: Button Sub-Menu

Buttons Sub-Menu

The Video Processor's Buttons menu options are tied to the four programmable buttons on the videoscope's control body, and the two foot pedals (optional) used with the system during stroboscopy procedures.

To select a function to be assigned to one of the buttons or pedals, simply highlight the button or pedal, and choose the function from the list displayed on the right, then press Enter.

Note: Any Videoscope Programmable Button can be configured for the following:

Disabled, Enhance, Freeze, Gain, Image Capture, Internal/External Video Enable, Light Intensity, Orientation, Pump On/Off, Remote Device, Peak/Average, Strobe On/Off, Video Capture, White Balance, Zoom.

The fourth menu heading (accessed by pressing Enter on the **Setup** menu) is **Clock**. The sub-menu options branching from the **Clock** menu are listed and described here.



Clock drop-down menu

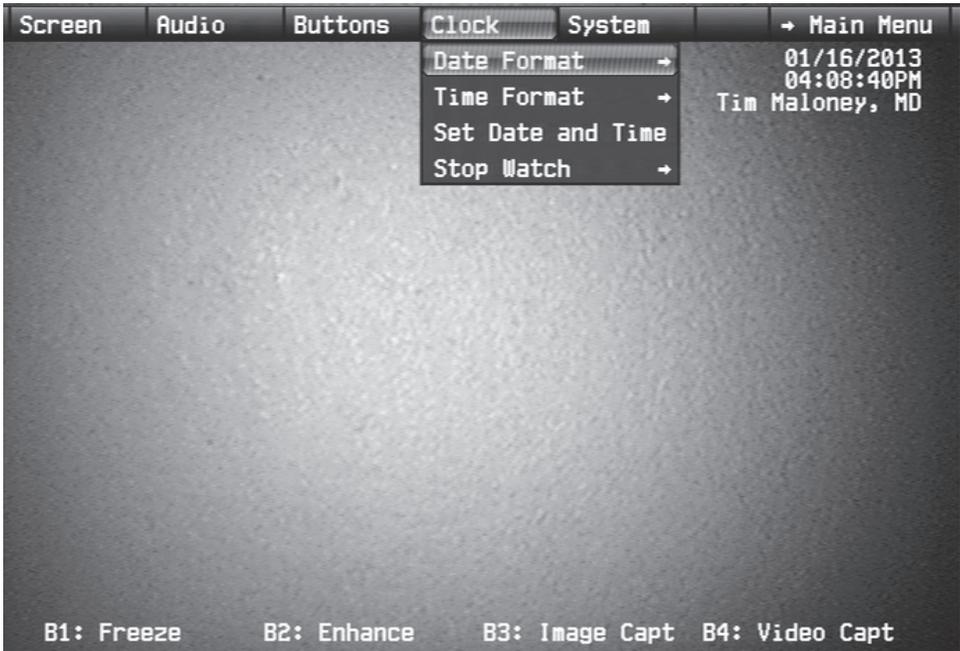


Fig. 5-27: Clock Sub-Menu

Clock Sub-Menu

The Video Processor’s Clock menu options are described in Table 5-8 below:

Function	Options
Date Format	Date Format- select the system’s date display format. Options are: MM/DD/YYYY, DD/MM/YYYY or YYYY/MM/DD
Time Format	Time Format - select the displayed time format, either 12 hr. (AM/PM) or 24 hr. (military) format
Set Date and Time	Set the system’s time and date
Stop Watch	Options are Start / Stop / Off

Table 5-8: Clock Sub-Menu

Note: Values in the date and time fields are set by entering values using the keyboard.

Date

Dates can be displayed on the monitor in one of the following formats:

- **Month/Day/Year**
- **Day/Month/Year**
- **Year/Month/Day**

Time

The current time is displayed in hours, minutes, and seconds. The time display is in either 24-hour or 12-hour (AM/PM) formats.

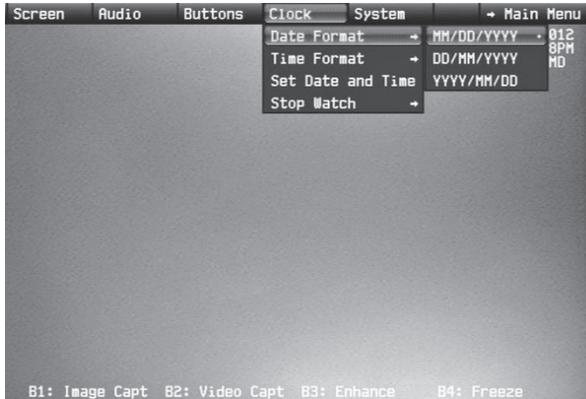


Fig. 5-28: Select Date Format

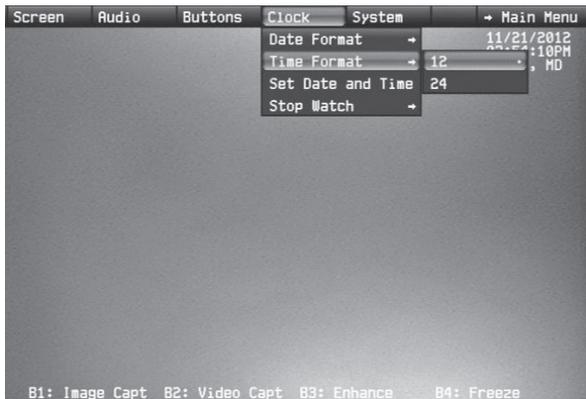


Fig. 5-29: Select Time Format

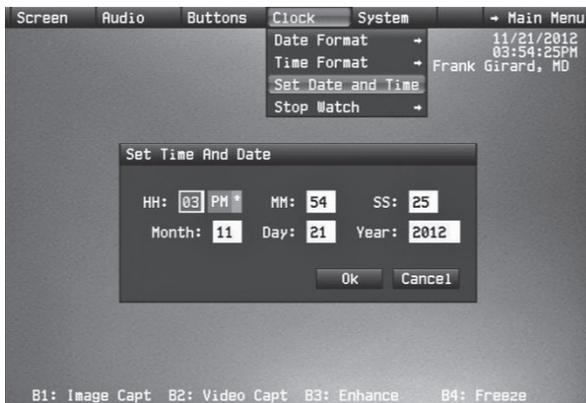


Fig. 5-30: Set Date and Time

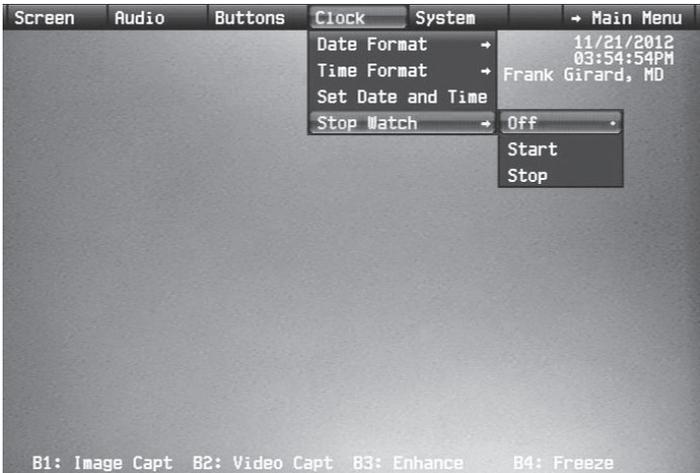


Fig. 5-31: Stop Watch Start/Stop

The fifth and final menu heading (accessed by pressing Enter on the **Setup** menu) is **System**. The sub-menu options branching from the **System** menu are listed and described here.



System drop-down menu

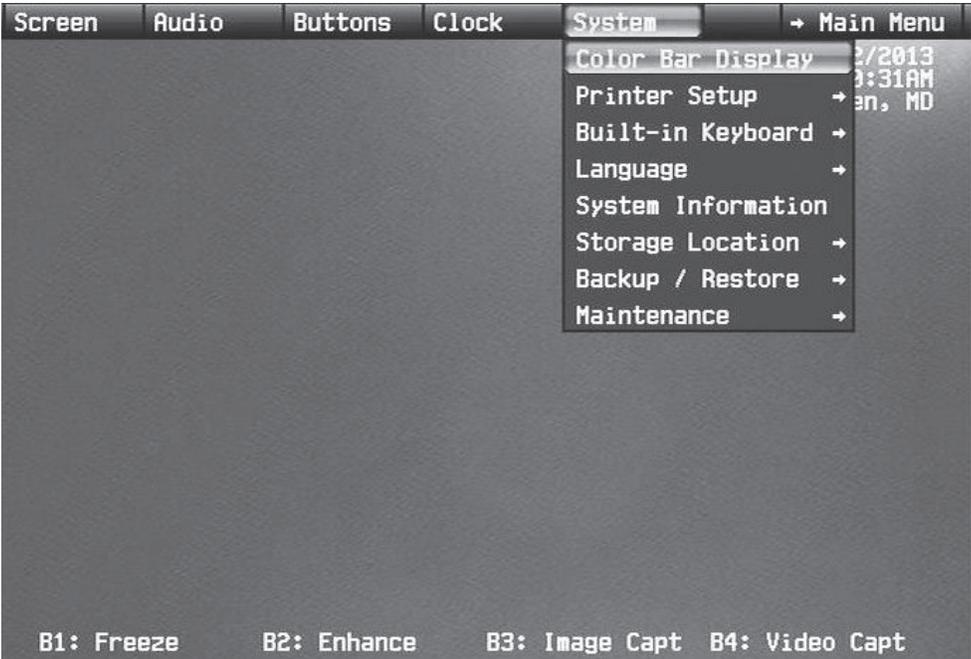


Fig. 5-32: System Sub-Menu

System Sub-Menu:

Function	Options
Color Bar Display	Displays color bar for adjusting the monitor
Printer Set-Up	User selects either video printer or a USB Postscript laser printer. Contact Cogentix Medical Customer Service for details on supported laser printers.
Built In Keyboard	Enable or disable the built-in keyboard
Language	Allows user to select from available languages. Language selection pertains only to the current active user. When selecting a different language, it is necessary to first 'Select User as Active' from the User List, and following the selection of the new language, the user must go back to the User List Menu and select 'Save Current Settings to Active User' and press Enter. This step is needed in order for the language change to remain in the system for the currently active user. This process must be repeated for all other users defined in the system if it is desired to have a new language selection for each user.
System Information	Displays information on the system including software version, DPU serial number, and other system parameters
Storage Location	Not currently supported (direct storage to SD Card only)
Backup/Restore	Backs up user settings and patient list data to SD card, or allows user to restore patient data from SD card. Restore is used only in case of system failure or lost data to restore user settings or patient list. The user can also backup all patient folders with associated images and video clips to a USB storage device. See Backup Images and Data section in Chapter 6 for more details.
Maintenance	Allows the user to perform different system maintenance functions: 1) View the system's log file (useful when contacting Customer Service); 2) View log file for the last SD card backup; 3) Repair SD Card, the unit's software can repair a faulty SD Card; 4) Erase all patient folders and files on SD card; 5) Erase all entries from Patient Archive database; 6) Erase all entries from the User List. When selecting any of the three Erase functions, the user must enter a confirming password.

Table 5-9: System Sub-Menu

Note: It is recommended that users periodically back up all patient and user list information stored in the Archive to an SD card. **Always keep SD cards in a secure location.** In the event of data loss or system failure, the SD card can be used to restore archive files and user settings by selecting **Restore**. It is very important to also periodically back up patient images and video recordings saved on the SD card to a secure location or copy to an attached USB storage device (hard disk or memory stick).

(System Sub-Menu Continued)

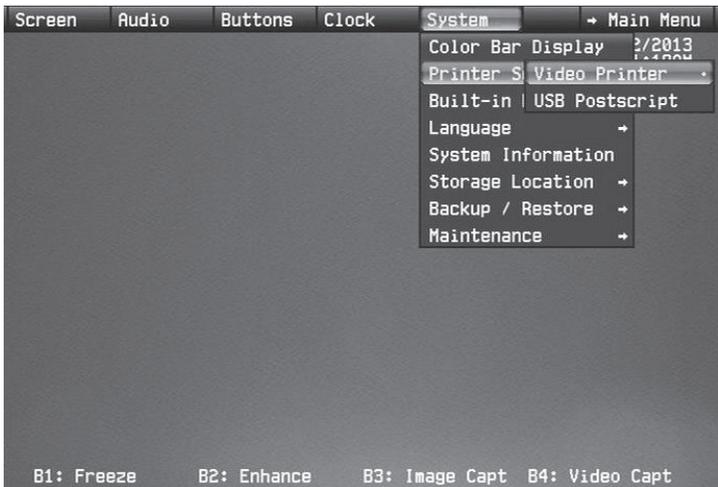


Fig. 5-33: Printer Setup Sub-Menu

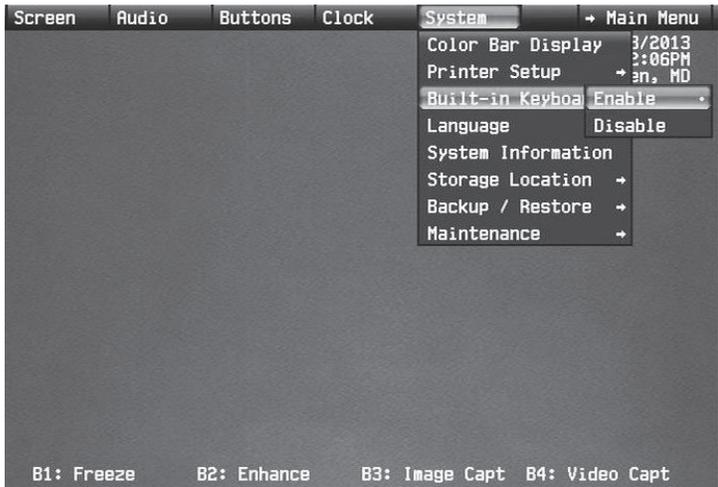


Fig. 5-34: Built-In Keyboard Options

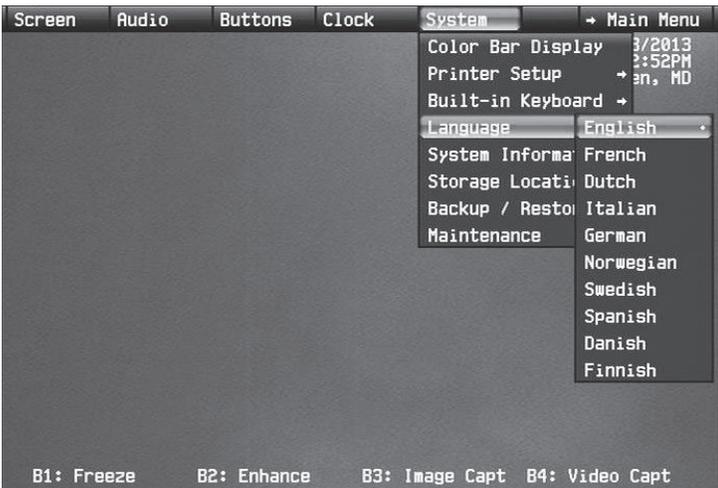


Fig. 5-35: Language Selection Sub-Menu

Menus and Sub-Menus

(System Sub-Menu Continued)



Fig. 5-36: System Information Screen



Fig. 5-37: Storage Location Indicator

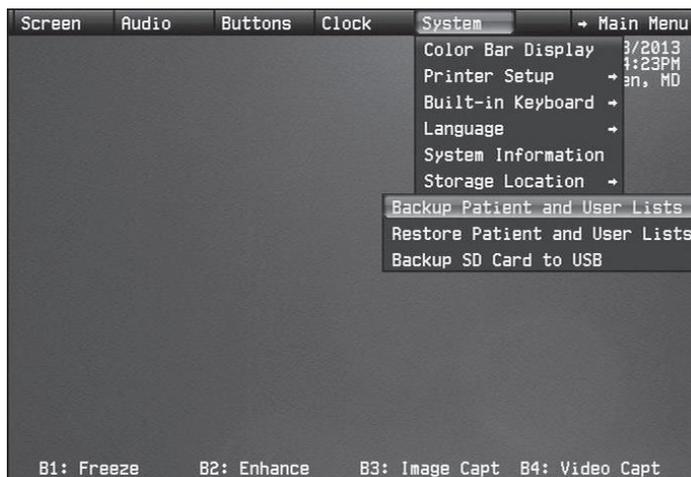


Fig. 5-38: Backup / Restore Sub-Menu

(System Sub-Menu Continued)

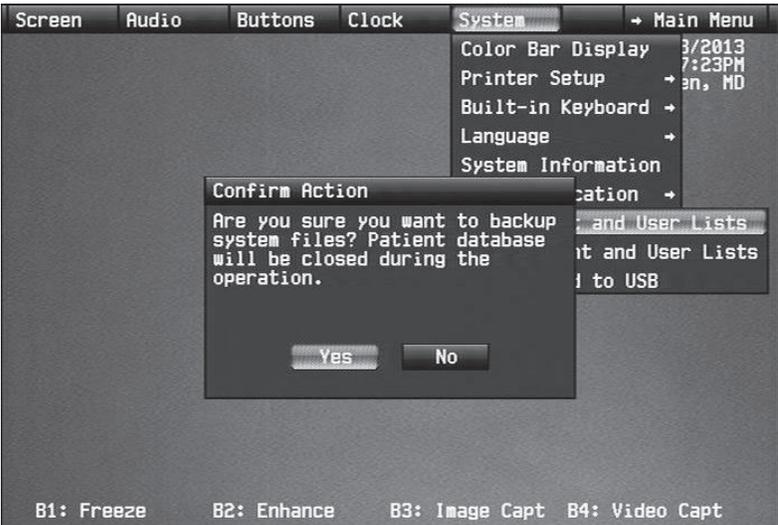


Fig. 5-39: Backup Confirmation Prompt

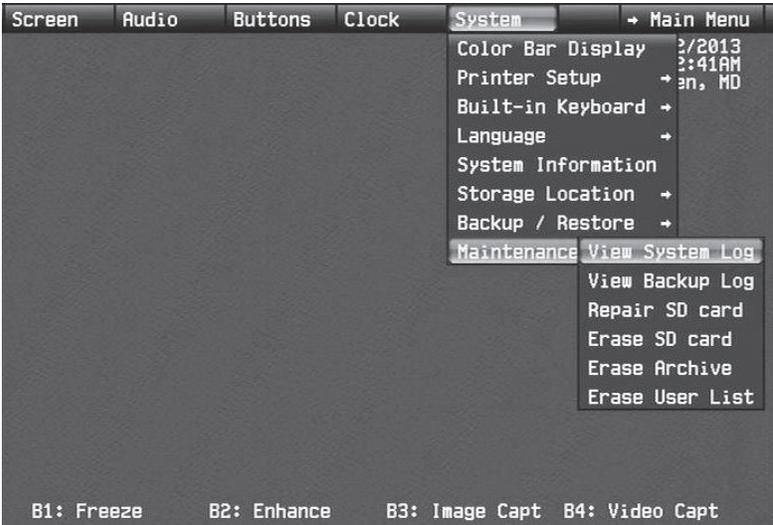


Fig. 5-40: Maintenance Sub-Menu

6 Operation

CAUTION

To avoid damage to the Video Processor's front panel or the attached keyboard, do not press any buttons or keys with sharp or pointed objects.

System Start-Up

When the unit is powered on, a short beep will sound once, and the image and main operating screen will display, after the system has completed initialization.

Front Panel Controls

The front panel buttons on the **DPU-7000A** Video Processor enable you to directly activate the device's functionality for the following:

- Light Intensity
- White Balance
- Gain
- Zoom
- Menu

In addition to the above function keys, the main **power button** for the unit is located on the far left of the front panel.

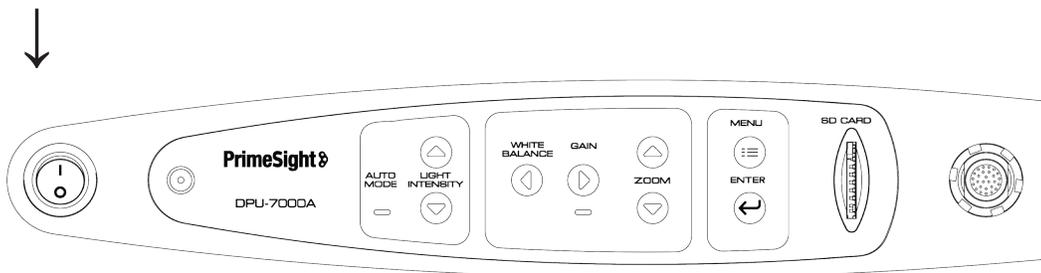


Fig. 6-1: Front Panel Controls

LCD Panel Controls

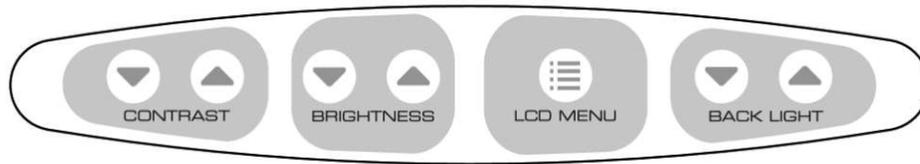


Fig. 6-2: LCD Control Panel

The LCD panel buttons on the **DPU-7000A** Video Processor (directly below the screen) enable users to access the unit's display functionality.

Press these Up and Down arrow buttons to activate functions directly:

- Contrast
- Brightness
- Back Light

Contrast and **Brightness** can be adjusted directly by pressing the up and down arrow buttons on the keypad, and also can be adjusted through the **LCD Menu**. **Back Light** affects the Processor's internal LCD lighting/illumination. This can be adjusted by pressing the Back Light Up and Down arrow buttons directly to make the screen appear brighter or darker. Note: there is no on-screen read-out for this feature, it is a visual adjustment only.

When the **LCD Menu** is activated, the user has access to the following settings:

- Contrast
- Brightness
- Color Hue
- Color Saturation
- Color Temperature
- Gamma
- Reset to Factory Defaults

In the **LCD Menu**, the top level of icons includes Contrast and Brightness images. To select one, press the Brightness Down arrow button to move to the lower level of displayed icons; then press the Contrast Up or Down arrow button (the Contrast Down arrow moves the cursor to the left, the Contrast Up arrow moves the cursor to the right) to make the selection. Once the image adjustment function is selected, by pressing the Brightness down arrow, use the keypad Contrast Up and Down arrows to increase / decrease the function's level.

Refer to Table 6-1 for Default LCD settings and corresponding values.

Reset to Default Settings

To reset the above display properties to the factory default settings:

- Press the LCD Menu button
- Scroll using Contrast Up arrow key to third icon (Utilities)
- Scroll down using Brightness Down arrow to lower level of icons
- Select the second image (shows factory) 
- Press the Brightness Down arrow button again (Enter) to confirm selection

Default LCD Monitor Settings for DPU-7000 Series

PARAMETER	VALUE
Brightness 	128
Contrast 	96
Color Temperature 	Custom Settings: Red = 255 Green = 246 Blue = 200
Saturation 	90
Hue 	128
Sharpness 	48
Gamma 	1.1

Table 6-1: Default LCD Monitor Settings for DPU-7000 Series



NOTE: Once the user resets to Default settings for LCD display, it is recommended that Saturation be reduced to **60** for optimal image quality.

Keyboard Controls – Basic Navigation and Editing

The tables in this section define the various functions that can be performed by pressing specific keys.

Press...	To
Up/Down/Left/Right/Tab Arrow/Cursor Key	Navigate through menus and highlight the next option
Enter	Select the highlighted menu option
Esc	Return to previous Menu level or exit if in the top level Menu

Table 6-2: Basic Navigation and Selection Keys

Operation

Use the following keys when entering and editing data:

Press...	To
Space Bar	Move the cursor forward by one character, inserting a blank space
BkSp	Move the cursor back one space, erasing the existing character in that space
Del	Delete the character at the cursor location and shift the remaining characters to the left
Up/Down Arrow Keys	Move the cursor one line up/down in a data entry screen
Left/Right Arrow Keys	Move the cursor one character left/right in a data entry screen
Tab	Moves to the next field in a data entry screen
Shift Tab	Moves user backwards on screen when in a data entry screen
Enter	Accept/select an entry
Esc	Exit the entry of Patient or User Data

Table 6-3: Editing Patient and User Data Keys

Keyboard



Fig. 6-3: Keyboard

Function Keys

This section describes the main keyboard's function keys, and if applicable, functionality using keys on the DPU's front panel keypad.



NOTE: For Function Key comparison between the **DPU-7000A** built-in keyboard and a typical off-the-shelf external keyboard, refer to Table A-3 in *Appendix* section.

Patient Entry

Opens the patient entry screen. Enter new patient information via this button.

Day List

The Day List is a patient scheduling assistance feature. The list allows for pre-selection of patients for an upcoming day.

To create a new Day List, press the Day List button (or select Day List from the Patient Drop Down menu). A patient entry list will display; select an empty position on the list for the corresponding time slot, press Enter. This brings up the list of patients previously entered into the system. When the patient is selected from the list, pressing Enter will place that patient into that slot in the Day List. Navigating through the patient list is done by using the up and down arrow keys. The date field for the Day List can be accessed by pressing the Tab key.

Once the Day List is populated, the data for the next patient is quickly retrieved by highlighting that patient in the Day List and pressing Enter.

After patient procedures are concluded for that date, the user should select Clear Day List from the Patient drop-down menu to enable creation of the next day's Day List.

User Select

This feature allows for automatic loading of user-preferred settings. Pressing this button opens the User Selection screen (the User List can include up to 15 users).

Each physician or clinical practitioner using the Processor will enter their name in the User List prior to selecting settings or image management preferences through the menu system. These selections are automatically restored for each user when their profile is selected (user must save settings via the drop down menu). Whenever a user changes a system setting, if they wish to have the new setting permanently saved, they must go to the User List and select *Save Current Settings to Active User*.

Navigating through the User List is done using the up/down buttons on the keyboard.

Operation

Text On/Off

Shows/Hides all on-screen text to display all overlay text messages and information, or only the image.

Int/Ext Video

This allows switching between displaying the video signal from the scope or from an auxiliary source through the Y/C In video input. This is required to review video recorded on external sources on the LCD display. The Int/Ext Video key must be pressed twice to switch to external video. Pressing Int/Ext Video again or pressing Esc switches back to video from the scope.

Archive Menu

This brings up a list of the current patient's archived files. If no patient is actively selected, this button will bring up the Archive Search screen.

Last Record

Jumps to display the last (most recent) media recorded (e.g. image or video) for the current patient.

Jump to Start

When this key is pressed during video playback, it jumps to the beginning of the video and stops. Press it again, and it jumps to the previous video recording or still image.

Jump to End

When this key is pressed during video playback, it jumps to the end of the video and stops. Press it again, and it jumps to the next video recording or still image.

Play/Pause

Play/Pause playback of current video file.

Stop

Stops playback and jumps to the start of the video file.

Variable Speed Playback / Slower

While playing a video recording, pressing this key will slow down playback from 1x to 1/2x to 1/4x to 1/8x speed.

Variable Speed Playback / Faster

While playing a video recording, pressing this key will increase playback speed up to 1x.



NOTE: In different modes of operation the following Super Keys, SK1, SK2, SK3, and SK4, will serve different functions. They are dual-function keys. For example, with multi-image selection, these keys are used to tag saved images (refer to *Multi-Image Display* section in this chapter).

Volume Down / SK1

Decreases the audio volume level over 10 steps. Also used to tag an image for Multi-Image Display.

Volume Up / SK2

Increases the audio volume level over 10 steps. Also used to tag a second image for Multi-Image Display.

Mute/ SK3

Mutes and unmutes the audio output. Also used to tag a third image for Multi-Image Display.

Delete/ SK4

Delete character during data entry.

Home/Light Intensity Up *also Light Intensity ↑ on Front Panel Keypad

Increases the light intensity over 8 steps (1 to 8) plus Auto. When light intensity is set to Auto the Front Panel Keypad Auto LED is on. Also used as Home key when editing text. In Archive or Patient File List screen, Home Key takes user to beginning of list.

Pg Up/Light Intensity Down *also Light Intensity ↓ on Front Panel Keypad

Decreases the light intensity over 8 steps from Auto to 8 down to 1. Also used as Page Up key when editing text. In Archive or Patient File List screen, Page Up Key moves user up one screen.

Pg Dn/Zoom In *also Zoom ↑ on Front Panel Keypad

Increases the Zoom level in steps of 0.1 from 1.0 to 2.0 times magnification. Also used as PgDn key when editing text. In Archive or Patient File List screen, Page Down Key moves user down one screen.

Operation

End/Zoom Out *also Zoom ↓ on Front Panel Keypad

Decreases the Zoom level in steps of 0.1 from 2.0 to 1.0 times magnification. Also used as End key when editing text. In Archive or Patient File List screen, End Key takes user to the end of the list.

Menu *also Menu on Front Panel Keypad

Opens the Menu system allowing access to system settings, user and patient entry and selection screens, archive functions, and image management features.

Remote

Triggers a remote peripheral function (video printer, external video recorder, etc.)

Print

Prints the currently displayed image.

Still Image

Captures the current image to the patient's folder as currently displayed (with all on-screen display).

Space/Freeze

Freeze the current image and initiate Picture-in-Picture Mode. Pressing the key again will end the Freeze Mode. In text entry, adds a space character.

Video

Starts/stops video capture to the current patient's folder, as currently displayed (with all on-screen display).

Enhance

Rotates through the Enhance modes (Off, Low, Medium, High).

Gain *also Gain on Front Panel Keypad

Toggles Gain On/Off. When on, the Front Panel Gain LED is on.

Strobe

Toggles Strobe On/Off.

← / Air

Air Pump On/Off.

Also used as Left Arrow cursor key.

↓ / Image Orient

Image Orientation – Normal/Flipped.

This rotates the image 180° for users holding the scope handle turned 180°.

Also used as Down Arrow cursor key.

→ / White Balance *also White Balance on Front Panel Keypad

To perform White Balance, press and hold for 2 seconds to activate. Shows a message while in progress and a successful or failed message upon completion. Also used as Right Arrow.

↑ / Up Arrow

Serves as Up Arrow directional cursor key only.

Enter *also Enter on Front Panel Keypad

When in Menu mode, press Enter to select highlighted option.

Press Enter when in confirmation screen to accept displayed option.

Backspace

Use Backspace key to move one character back when entering/editing text.

Screen Structure

The screen is composed of four main areas:

- **Menu Bar:** Top line of screen contains the major menu categories.
- **Drop Down (or Sub) Menus:** When using keyboard cursor/arrow keys to highlight menu heading, sub-menus automatically appear on the screen to provide user with more detailed choices.
- **Programmable Button Display:** Bottom line of screen displays the button number and assigned function of Control Body buttons programmed to activate certain functions. The Programmable Button Display can be turned off in the SCREEN menu.
- **Video Image Field:** Procedural video images occupy the entire screen.

Screen Modes

- **Live Video** can be processed to display in various ways (Orientation, Enhance, Gain, and other real-time image manipulations). On top of the live endoscopic image, various elements can appear – On Screen Display (OSD), Notes, the Menu System, etc.
- **Picture in Picture and Freeze Mode**
When the user freezes an image, by default the frozen snapshot image will be shown full screen, and an inset will continue to show the live video image. The location of the inset window can be changed. This function has two options – Frame Mode and Field Mode. Each mode is better at freezing a different type of image, as shown in Table 6-4:

Endoscopic Image Condition	Recommended Freeze Mode
Capturing Static Image at High Resolution	FRAME
Capturing Rapid Movement	FIELD

Table 6-4: Freeze Modes

To change or select the Freeze Mode, highlight **FREEZE MODE** setting, located in the Screen sub-menu (from the main Set Up menu).

- **Archiving** mode will display on the full screen once a media file is retrieved. All OSD display will be turned off automatically for this mode, as the media files will carry all the OSD information from the time it was recorded. When the user is viewing a pre-recorded video, the system indicator for this mode is a progress bar with the elapsed / total time displayed along with the current frame / total frames counter displayed at the bottom of the screen. The Text On/Off key can toggle the progress bar off and on during playback.

Audio / Video

With the Cogentix Medical **DPU-7000A** Video Processor, audio is recorded as part of a video recording. Audio can be recorded from the "Audio In" input (for audio outputs from devices such as the STR-5000 Stroboscopy unit) or from a standard microphone which is connected directly to the "Mic" input on the rear panel of the DPU.

Playback can be done through the internal loudspeaker, earphones, or external loudspeaker.

Volume can be controlled through the main keyboard, or from the on-screen Audio drop-down menu (Audio sub-menu from the main Setup menu).

When viewing video or a still image, a status line at the bottom of the screen will indicate patient initials, ID number, date, time and file type.

While viewing previously captured video, the following functions are available:

- Esc – exit back to patient’s archive list
- Print – print image of current screen
- Playback speed up or slow down
- Pause/Play
- Play from Start
- One Frame Forward/Back (while paused, same keys as speed up/slow down)

Videoscope Programmable Buttons

Using the Videoscope Programmable Buttons or optional Foot Pedal provides direct access to processor functions as specified. See Figure 3-3 in Chapter 3, *Equipment and Functions*, for a diagram of the Videoscope’s Control Body and Control Buttons. Consult Chapter 5, *Menus and Sub-Menus*, for instructions on how to change the assigned function for each button or pedal through the Button Setting menu.

Stroboscopic Function (Laryngological Procedures Only)

The **DPU-7000A** Digital Video Processor can be connected to the **STR-5000** Stroboscopy Unit, which is an external unit that provides pulsed LED illumination. This effect allows “stop-motion” or “slow-motion” viewing of the vocal folds as they vibrate during laryngological endoscopic procedures.

CAUTION

Review the **STR-5000** Stroboscopy Unit’s User’s Manual before utilizing the stroboscopy function.

To enable the Strobe function:

- Confirm that the **STR-5000** Stroboscopy Unit is connected to the Video Processor and powered on. If Strobe data is to be displayed on-screen, confirm that the Strobe Data Cable is connected.
- If Strobe audio is to be recorded, confirm that the Strobe’s Audio Out cable is connected to Line In on the Video Processor.
- Using the **Strobe** keyboard function key, or the Control Button on the videoscope or optional Foot Pedal which has been assigned to the Strobe On/Off function, turn on the Stroboscopy mode.
- Adjust the illumination level with the Strobe unit’s intensity knob.
- The Monitor Display should display **STROBE ON**.
- Press the **Strobe** keyboard function key or assigned Control Button or Foot Pedal again to turn off the Stroboscopy mode.
- The Monitor Display should display **STROBE OFF**.



NOTE: If the **STR-5000** Stroboscopy Unit is connected and NOT powered ON or NOT connected to the Video Processor at all, or if the Stroboscopy Unit's light control is turned down, illumination will STOP when the strobe function is activated by either a videoscope Control Button or the keyboard. To restart the illumination, turn off Strobe mode, correct the problem, and then resume Strobe mode.

When the Strobe mode is On, the Video Processor's LEDs for AUTO MODE and GAIN will flash on and off to indicate that the **STR-5000** Stroboscopy Unit is controlling the illumination.

Capture Images or Video to an SD (Secure Digital) Card

The **DPU-7000A** Digital Video Processor allows for still endoscopic images or video recording to be captured and stored on a Secure Digital memory card (SD Card) inserted into the SD Card slot on the front panel. Compatible cards are Secure Digital Standard Capacity (up to 2GB) or Secure Digital High Capacity (greater than 2GB, marked SDHC).

CAUTION Do not touch the gold contacts on the SD Card to avoid the possibility of electrostatic damage to the card. Store the SD Card in its protective case when not being used.

CAUTION Always clear patient data on the SD card if removing from secure facility location. If video processor needs to be transported or sent for service **ALWAYS** remove the SD Card and store in a secure location. **ALWAYS keep patient data private and secure.**

Insert the SD Card

- Confirm that a compatible SD Card is being used (supplied with the unit or other SD or SDHC Cards).



NOTE: The **DPU-7000A** Processor standard package contains a 16 GB SD Memory Card.

With the SD Card "notch" facing upwards, and the label on the SD Card facing to the left (the gold contacts on the SD Card facing inward towards the slot), gently push the SD Card into the slot on the front of the Processor until it stops and "clicks" into secure position.

SD Card Size	Total No. Still Images	Total Video Recording Time
2 GB	23,000	30 minutes
8 GB	93,000	120 minutes
16 GB	186,000	240 minutes
32 GB	372,000	480 minutes

Table 6-5: SD Card Recording Capacity



NOTE: Typical Still Image Size: 90 KB
Typical Video Recording Size: 66 MB/Min.

Set Up

To allow images or video to be captured onto the SD Card using the **DPU-7000 Series** Digital Video Processor, certain patient data **must** be entered into the relevant fields using the keyboard; or previously entered patient information should be selected from the database or Day List.

To Capture, the following fields must have data:

- ▣ Patient ID
- ▣ Patient's First, Middle (optional) and Last Name
- ▣ Patient's Date of Birth

To set one of the programmable Control Buttons on the scope or optional Foot Pedal to activate the **STILL** or **VIDEO CAPTURE** function, please refer to Chapter 5, *Menus and Sub-Menus*, Button Setting Menu.

Capture an Image or Video

Press the preprogrammed **IMAGE CAPTURE** Control Button on the Videoscope's Control Body, or the **STILL** button on the keyboard to capture an image. Press the **VIDEO** button on the keyboard to start video capturing, and press it again to stop.

Review Captured Images or Video

Select Archive from the main menu or keyboard to display a directory of the current patient folders with images saved on the SD Card. Use the keyboard Up/Down Arrow keys to scroll through the directory of patient folders. Press the **Enter** key to select a patient folder and display the list of images or video clips stored within that folder. Press the **Enter** key to display a particular image or video. Press the **Esc** key to go back or exit the playback mode. To directly access images and video for the current patient, press the Archive key. To control video playback, use the playback keys on the keyboard, top row, to play, pause, stop, rewind, or fast forward the video.

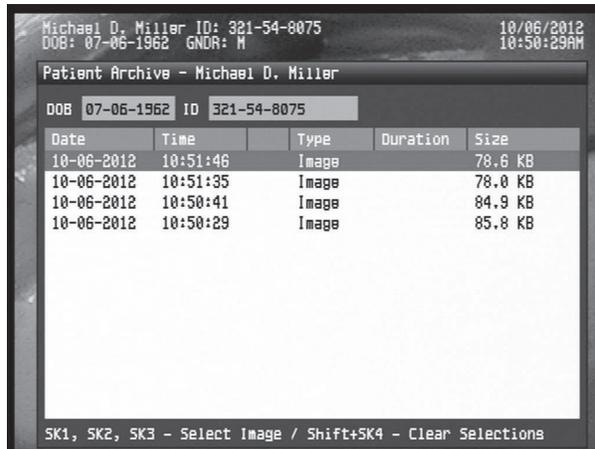
Multi-Image Display

This innovative feature enables the user to select up to four saved images from the patient archive and display them side-by-side on-screen.

To select an image, viewing the list of patient images on the screen, highlight the first image and press the SK1 key on the keyboard; this tags the image. Select a second image on the list, press the SK2 key to tag the second image. Press the Enter key and the DPU will display both images side-by-side. Select a third image from the list and press the SK3 key to tag the third image; press Enter and three images will appear together on-screen. When an image is tagged, pressing the SK key again will turn off the tag. The fourth image does not require a tag; if a fourth image is desired for display, simply scroll to the image on the list and once it is highlighted, pressing Enter will display all four selected images side-by-side.

Operation

Pressing the Enter key while in **Multi-Image Display** will display the selected image full-screen. Use the cursor keys to highlight a different image while in multi-display mode. While in full-screen display the cursor keys can be used to sequence through the tagged images.



Michael D. Miller ID: 321-54-8075 10/06/2012
DOB: 07-06-1962 GNDR: M 10:50:29AM

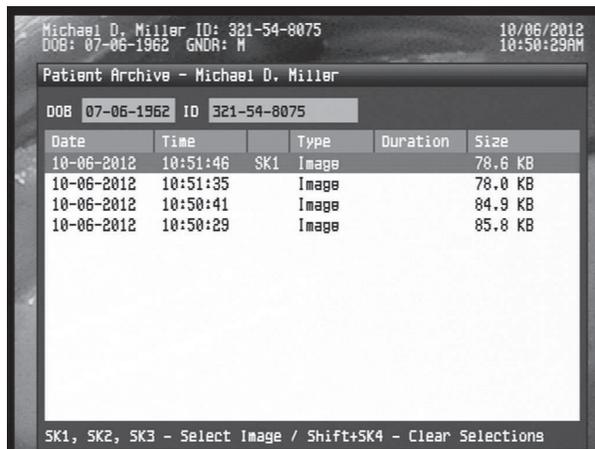
Patient Archive - Michael D. Miller

DOB 07-06-1962 ID 321-54-8075

Date	Time	Type	Duration	Size
10-06-2012	10:51:46	Image		78.6 KB
10-06-2012	10:51:35	Image		78.0 KB
10-06-2012	10:50:41	Image		84.9 KB
10-06-2012	10:50:29	Image		85.8 KB

SK1, SK2, SK3 - Select Image / Shift+SK4 - Clear Selections

Fig. 6-4: Select Patient Image for Display



Michael D. Miller ID: 321-54-8075 10/06/2012
DOB: 07-06-1962 GNDR: M 10:50:29AM

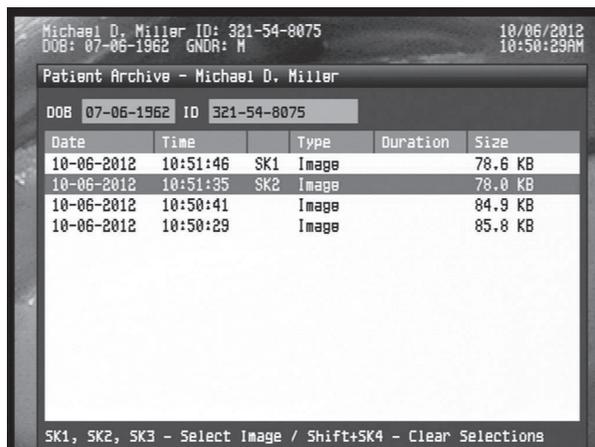
Patient Archive - Michael D. Miller

DOB 07-06-1962 ID 321-54-8075

Date	Time	Type	Duration	Size
10-06-2012	10:51:46	SK1 Image		78.6 KB
10-06-2012	10:51:35	Image		78.0 KB
10-06-2012	10:50:41	Image		84.9 KB
10-06-2012	10:50:29	Image		85.8 KB

SK1, SK2, SK3 - Select Image / Shift+SK4 - Clear Selections

Fig. 6-5: Tag 1 for Multi-Image Display



Michael D. Miller ID: 321-54-8075 10/06/2012
DOB: 07-06-1962 GNDR: M 10:50:29AM

Patient Archive - Michael D. Miller

DOB 07-06-1962 ID 321-54-8075

Date	Time	Type	Duration	Size
10-06-2012	10:51:46	SK1 Image		78.6 KB
10-06-2012	10:51:35	SK2 Image		78.0 KB
10-06-2012	10:50:41	Image		84.9 KB
10-06-2012	10:50:29	Image		85.8 KB

SK1, SK2, SK3 - Select Image / Shift+SK4 - Clear Selections

Fig. 6-6: Tag 2 for Multi-Image Display

(Multi-Image Display Continued)

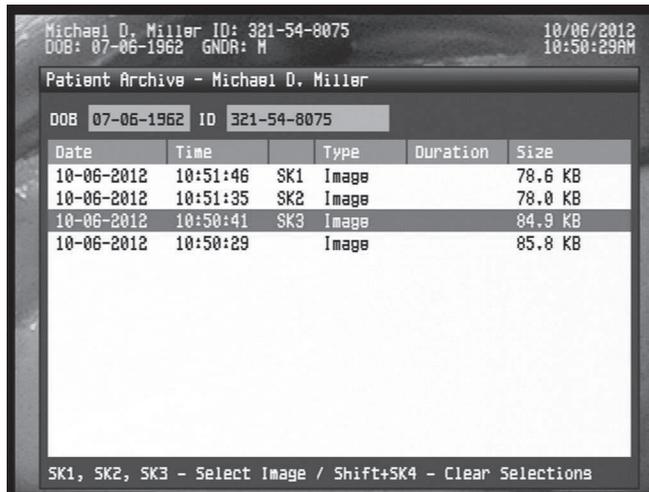


Fig. 6-7: Tag 3 for Multi-Image Display

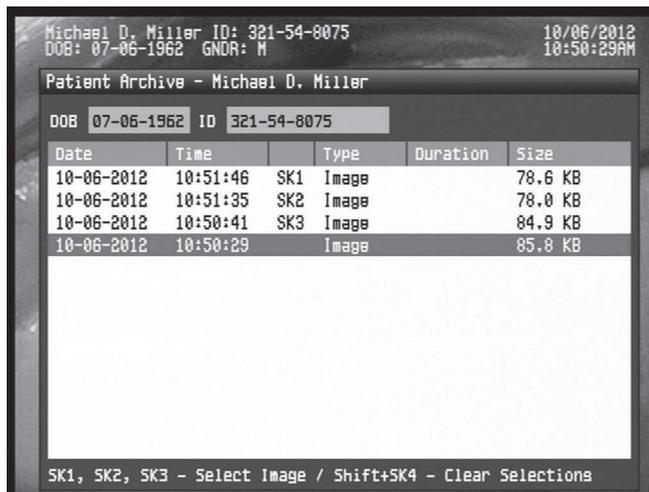


Fig. 6-8: Select 4th Image for Multi-Image Display

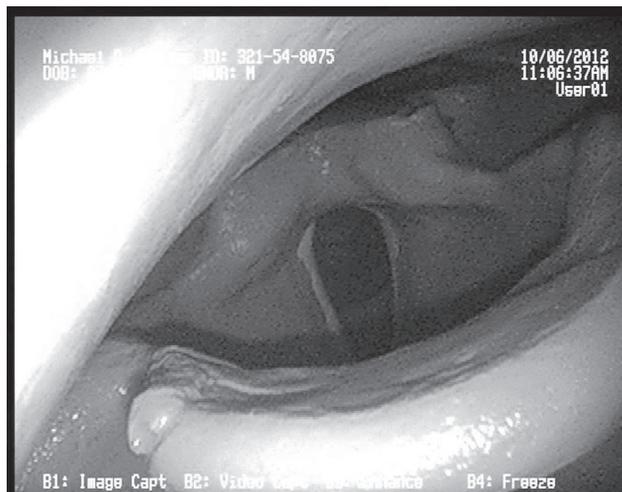


Fig. 6-9: Single Image Display

Operation

(Multi-Image Display Continued)



Fig. 6-10: Multi-Image Display (3 Images)

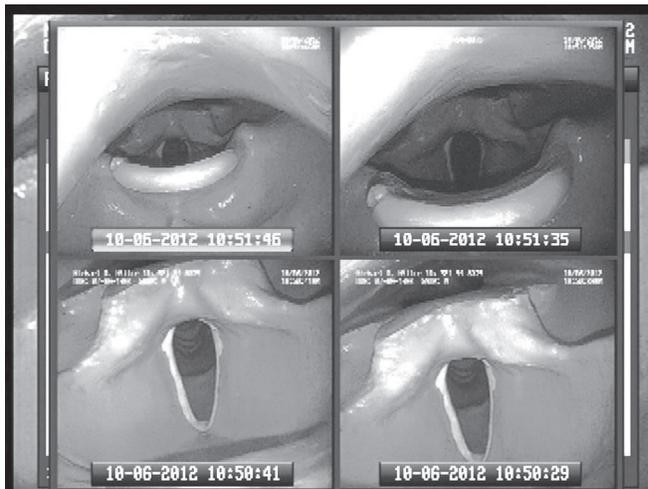


Fig. 6-11: Multi-Image Display (4 Images)

Note: Shift + SK4 will clear these image selections.

Printing Images

Images displayed on the DPU-7000A may be printed to either a video printer or laser printer. The selection of printer type is made on the Printer Setup menu. The video printer should be connected to one of the compatible video output ports on the rear of the DPU-7000A as well as connecting the Remote output port on the DPU-7000 to the Remote control port on the printer using the optional Remote Control Cable (Cat. #07-2064). A Postscript-compatible color laser printer (Cat. #07-7034) may instead be used for printing images. The laser printer is connected to one of the available USB ports on the DPU-7000A using optional USB Cable (Cat. #07-5022). Contact Cogentix Medical Customer Service for details regarding compatible laser printers.

CAUTION

A medical grade isolation transformer must be used for the power cord connection for any peripheral such as a printer which is non-medical grade in order to prevent the risk of electric shock.

Transfer Images or Video Files to an External Computer

- Remove the SD Card from the processor.
- Insert the SD Card into a card reader either integrated with or connected to a computer.
- Optionally the user can connect the external computer directly to the **COMPUTER** port on the rear panel of the DPU, using a USB Type A/B cable (Cat. #07-5022). This will allow the user to use the computer's file management application (e.g., Windows Explorer) to access the files on the DPU as an external storage device.
- Archive the files by "dragging and dropping" them from the SD Card to a selected folder or other storage location on the computer.

Backup Images and Data

Patient folders with still images and video recordings saved on the SD card may be archived to a USB storage device connected to the DPU-7000A. If the contents of the SD card are not saved separately to another secure location such as a computer, it is strongly recommended to backup patient data to a USB storage device such as a USB 2.0 hard drive or USB flash memory stick (NTFS file format only). Contact Cogentix Medical Customer Service for information regarding compatible USB storage devices. The backup operation is initiated by selected the "Backup SD Card to USB" function under the Backup/Restore entry in the System menu. Only those new patient folders and files contained on the SD card are copied to the USB storage device .



NOTE: Whenever a USB storage device is connected to the DPU-7000A, there will be a delay of about one minute while the system detects and connects to the USB storage device. If this delay presents an inconvenience, then only connect the storage device to the system when ready to perform a backup operation.

To avoid the loss or corruption of data on the USB storage device, do not power off the unit until the backup operation is complete.

External Video Replay

The **DPU-7000 Series** Video Processor with on-board LCD monitor supports a **replay capability** so that video recorded on an external recorder such as a DVD recorder or image archive recorder may be played back through the Video Processor and viewed on the LCD monitor of the Video Processor.

Set Up and Use of the Int/Ext Video Function

1. Connect an S-Video Cable from the **Y/C OUT** connector on the rear of the Video Processor to the Y/C input of the recording device.

Operation

2. Connect an S-Video Cable from the **Y/C IN** connector on the rear of the Video Processor to the Y/C output of the recording device.
3. During the endoscopic examination, activate the Video Recorder as necessary to record the procedure.
4. Following the procedure, to view the recorded session on the LCD monitor of the Video Processor, press the **Int/Ext Video** key on the keyboard. When the message prompt "**Press again to confirm**" is displayed, press **Int/Ext Video** a second time to switch to the external video input. There will be a momentary flicker in the image (up to 5 seconds) on the monitor while the Video Processor switches the video source.
5. Use the controls of the external recording unit to play, pause, rewind, fast-forward or stop as desired.
6. When finished viewing the recorded session, press **Int/Ext Video** or **Esc** to switch the monitor back to the internal live image from the Videoscope. The message "**LIVE IMAGE**" will be displayed for 5 seconds to confirm that the monitor has switched back.

Playback of Archived Stills/Video from an External Hard Drive

1. Connect the external hard drive to either USB port on rear panel of the DPU.
Note: External hard drive must be formatted to NTFS file system.
An SD card must be in the DPU slot in order to view external storage.
2. Turn on the DPU-7000.
Note: "USB Storage Detected, Please Wait" message will appear. It will take a minute or two to configure the system.
3. Press **Menu** button
4. Scroll to **Archive** menu, select **Search Storage** from the drop-down menu.
5. Tab to highlight **Media**, and select **USB**.
6. Archived folders of stills and videos will appear in a list.
Note: Only files originally recorded from the DPU-7000 can be played back from an external hard drive.
7. Folders/Images can be sorted and/or filtered by ID, Last Name, and DOB, just as they are when viewed from an SD Card.

7 Adjust the Image Quality

If this is the first installation and use of the **DPU-7000A** Video Processor and peripheral equipment, or if illumination conditions have changed since the previous use, perform the procedures described in this chapter to obtain sharp, clear images.

At any time during use, the following image characteristics may be adjusted using either the buttons on the Video Processor's front panel or keys on the keyboard:

- White Balance
- Light Intensity
- Gain
- Enhance
- Zoom



NOTE: When adjusting the image, status messages appear in the Message Field on the Monitor (located in the lower left area of the monitor display).

White Balance

White Balance should be performed when:

- Operating the system for the first time
- If lighting conditions change
- If a different videoscope is used
- Or if colors seem to differ from "true" colors

To White Balance:

- Point the distal end of the endoscope at a **white** object, such as a white cloth or sheet of paper. Hold the endoscope tip approximately one inch (3cm) from the white target and keep it steady during the White Balance procedure.



NOTE: Make sure the picture is not saturated by excessive illumination.

Press and hold the Processor's WHITE BALANCE (Left Arrow) button on Front Panel Keypad until a beep sounds (approx. 2 secs.). This function can also be activated by pressing the WBal key on the keyboard for 2 seconds.

Hold the endoscope tip steady until the white balance function is completed (up to ten seconds) and a message is displayed.

Adjust the Image Quality

If White Balance is successfully completed, the following message is displayed in the Message Field and a short beep sounds:

W/B OK

If the White Balance was not completed successfully, the following message is displayed in the Message Field with a long beep:

W/B FAILED

Repeat the above procedures if the White Balance is not completed successfully or as needed. The **DPU-7000A** Video Processor stores the White Balance setting in the videoscope but should be repeated when changing videoscopes, video processors or when viewing conditions change.

Light Intensity

This function allows users to adjust the amount of light emitted from the connected endoscope's light source. Compared to the Brightness function, this can be considered as a "hardware" adjustment rather than a "software" adjustment of the displayed picture.

This setting can be adjusted between levels 1 (lowest) through 8 (highest), with an **Auto** setting also available. **Auto** setting is the default when the Video Processor is powered on.

Adjust the Light Intensity

- Press one of the LIGHT INTENSITY buttons on the Video Processor's front panel; the Light Intensity Up (Home) and Light Intensity Down (PgUp) buttons on the main keyboard can be used; or select Light Intensity from the Image drop-down menu to adjust light intensity on-screen.
- When using the front panel keypad or main keyboard, press the Light Intensity Up Arrow (or Home) button to increase the light intensity incrementally.
- Press the Light Intensity Down Arrow (or PgUp) button to decrease the light intensity incrementally.

Each press on the button increases or decreases the intensity one level. Continue pressing, and after one second of holding, the intensity level will increase or decrease at a rate of 2 steps per second.

LIGHT INTENSITY level is displayed on the monitor.



NOTE: The LED for AUTO MODE (front panel) is turned on or off as the user changes the Light Intensity setting for Automatic Light Control mode (AUTO) or one of the eight manual light intensity settings.

Zoom

Adjust the Zoom level, from 1.0 times to 2.0 times in steps of 0.1, at any time during use. By default, when the Zoom level is other than 1.0, the screen will display the Zoom level.

1. Press one of the ZOOM buttons on the Video Processor's front panel or on the keyboard:
2. Press the ZOOM Up Arrow button on the front panel, or the Zoom Up (PgDn) key on the keyboard to Zoom In incrementally.
3. Press the ZOOM Down Arrow button on the front panel, or the Zoom Down (End) key on the keyboard to Zoom Out incrementally.
4. ZOOM 1.0 to ZOOM 2.0 is displayed on the monitor.

Note: the ZOOM setting can also be adjusted on-screen through the Image drop down menu (main menu line).

Gain

Adjust the Gain to compensate for dark or poorly illuminated areas and to brighten the image without adding more light. The Gain function should be used only **after** the image has been adjusted using the Light Intensity and Brightness functions, and it is determined that the image is still dark or poorly illuminated. Adjusting the Gain can introduce noise to the image and impair its quality.

To Toggle Between Gain On /Gain Off, choose one of the following:

Press the Gain key on the keyboard to toggle GAIN ON/OFF,
Press the Gain▶ button on the front panel of the Video Processor,
Press the assigned Control Button (on the videoscope) or optional Foot Pedal.
Highlight GAIN on the Image setting menu and select ON or OFF. Press Enter.

GAIN ON is displayed on the monitor, and the LED below the GAIN button on the Video Processor's front panel is illuminated.

Enhance

Adjust the sharpness of the image displayed on the monitor using the ENHANCE function. This adjustment should be made when using the Video Processor for the first time, and again during use as needed.

The four (4) image enhancement levels are:

- **OFF**→ **LOW**→ **MEDIUM**→ **HIGH**

To Enhance the Image

- Highlight ENHANCE on the Image setting menu:
(Enhancement levels: **OFF** – **LOW** – **MEDIUM** – **HIGH**)
Step through the levels to reach the desired one.

Adjust the Image Quality

Press the Enhance key on the keyboard to cycle through the level, or
Press the Control Button on the videoscope or foot pedal which is assigned to Enhance.

Shutter Window (Shutter Size)

Adjust the size of the shutter window to balance the exposure when in Auto Light Intensity or Auto Shutter Speed modes. Specify one of the following sizes:

- **Small** (central 50%) → **Medium** (central 75%) → **Full** (entire picture)

To Adjust the Shutter Window

- Highlight SHUTTER WINDOW on the Image setting (main) menu
- Press the ↑ or ↓ keys on the keyboard to cycle through the sizes
- Press Enter. If no other settings are to be changed, press either the Esc key on the keyboard or the MENU button on the Video Processor's front panel twice to exit the menu.

Shutter Speed

For normal usage, the processor will set the shutter speed to MAX and the light intensity to AUTO. This setting will automatically calculate the proper light intensity and shutter speed to optimize the image. Cogentix Medical recommends that the manual settings listed below be used for specialized tasks only. Contact Cogentix Medical Customer Service for further information on manual selection of the shutter speed.

The available shutter-speed settings are listed below. The settings represent fractions of a second (1/100, 1/1000, etc.). The exposure of the image will change with each new shutter speed setting.

- | | |
|-----------------|-------------------|
| • Auto | • 1/2500 |
| • Max | • 1/5000 |
| • 1/100 | • 1/10000 |
| • 1/250 | • 1/25000 |
| • 1/500 | • 1/50000 |
| • 1/1000 | • 1/100000 |



NOTE: Shutter Speed cannot be adjusted if Light Intensity is set to AUTO. First set Light Intensity to a manual setting (1 to 8) and then adjust the Shutter Speed.



NOTE: Generally, best imaging conditions will be obtained when LIGHT INTENSITY is set to AUTO.

To Adjust the Shutter Speed

- Highlight SHUTTER SPEED on the Image setting (main) menu
Press the ↑ or ↓ keys on the keyboard to cycle through the sizes
- Press Enter. If no other settings are to be changed, press either the Esc key on the keyboard or the MENU button to exit menu.

Peak/Average

This function allows the user to change the basis on which the automatic exposure is adjusted. It represents the ratio of the brightest spot in the image to the average brightness of the overall image.

The setting enables the user to change the percentage weighting for the exposure control between PEAK Priority/AVE Priority. Thus, an upper control setting of '90/10' gives maximum priority to the brightest area in the image, whereas a '10/90' setting gives maximum priority to the average brightness of the entire image. A '50/50' setting is the balance between **PEAK** and **AVE and is the default and recommended setting.**

The Peak/Ave settings and selections can be found under the Image sub-menu.

Brightness

Adjust the Brightness

Adjust the Brightness to compensate for a dark image, or at any time during use.

- Highlight BRIGHTNESS on the Image setting (main) menu
- Press the Up Arrow (↑) button to increase the Brightness incrementally
- Press the Down Arrow (↓) button to decrease the Brightness incrementally

The Video Processor stores the Brightness setting for the current user and scope type until it is modified by the user. Do not confuse the DPU's Brightness control with the Brightness control of the LCD monitor.

Color Red, Color Blue, and Color Intensity

Adjust the Color Intensity

Adjust the colors of the endoscopic image to user's preference, at any time during use.

- Highlight either COLOR RED, COLOR BLUE, or COLOR INTENSITY on Image menu
- Press the Up Arrow (↑) button or Down Arrow (↓) button to increase or decrease the color setting incrementally (range is -5 to +5)
- User can adjust the overall color strength or intensity using COLOR INTENSITY or separately adjust red or blue coloration by selecting these options on the Image drop-down menu

8 Maintenance and Storage

CAUTION

The **DPU-7000 Series** Video Processors cannot be autoclaved, steam-sterilized, or subjected to immersion. Any of these cleaning methods can cause severe equipment damage.

Always disconnect the power cable before cleaning or disinfecting any component of the Video Processor. Failure to do so may result in injury and/or equipment damage.

Make sure that connectors and ventilation ports on the **DPU-7000 Series** Video Processors do not get wet or splashed with liquids. This could cause equipment damage or may create electric shock the next time the equipment is used.

The **DPU-7000 Series** Video Processors contain no user-serviceable parts (except for fuse replacement). Attempting to perform anything except routine maintenance tasks as described in this chapter could cause equipment damage.

WARNING

Do not attempt to open or modify the video processor. Doing so can present a risk of shock to the user or patient. DPU-7000 Series video processors may only be serviced at authorized Cogentix Medical facilities.

When the procedure is complete, the endoscopic system must be disconnected and its components reprocessed. Since the Video Processor normally does not come in contact with patients, and due to its sensitive internal electronics, only surface cleaning and disinfection should be performed on the Video Processor.

Follow the procedures given in this chapter for inspecting and cleaning the **DPU-7000 Series** Digital Video Processors and components.

After Use

Refer to the operating instructions supplied with all endoscopic equipment to establish the correct order in which components should be turned off and disconnected. Some peripheral devices must be turned off before equipment is disconnected to avoid compromising their operation.

Wipe all external, non-LCD display surfaces clean with gauze slightly dampened with alcohol.

Gently wipe the LCD Display with an appropriate screen cleaner.

Routine Periodic Inspection

Although the **DPU-7000 Series** Video Processors contain no user-serviceable parts (except for fuse replacement), there are periodic inspection procedures that users can perform in addition to those performed before and/or after procedures to assist in detecting problems that could affect the unit's operation. Among the steps in such an inspection procedure:

- Verify that the Video Processor's power plug and signal connections are securely attached.
- Verify that all switches and lights on the Video Processor are working properly.
- Verify that all cables are in good condition and have not sustained any damage beyond normal wear and tear.
- Verify that all equipment is in good working condition immediately after routine cleaning/disinfection, or after the Video Processor is transported or moved between locations.

Surface Cleaning and Disinfection

CAUTION Failure to properly clean the surface of the Video Processor may impair effective surface disinfection.

Do not allow liquids or excessive moisture to get on or into the Video Processor. This could cause equipment damage.

Do not use cleaning/disinfecting agents that are not permitted for use with plastics. For example, ammonia, acetone, or salty acids (such as HCl, for example). Such agents could weaken and/or otherwise damage the surfaces of the Video Processor.

The cleaning/disinfecting procedure should be performed while the Videoscope Cable's Plug is connected to the Video Processor to prevent excess fluid from entering the receptacle.

Do not use incompatible cleaning/disinfecting agents on the Video Processor's LCD display (alcohols, for example). Doing so could damage the display screen.

Acceptable Reprocessing Materials

Cleaning	Disinfection
A compatible electronics-surface detergent	A compatible electronics surface disinfectant
70% isopropyl alcohol	70% isopropyl alcohol
Enzymatic cleaner	Soft material (gauze 4 x 4)
Soft material (gauze 4 x 4)	

Cleaning the Processor

DPU-7000 Series Video Processors should only be cleaned with agents designed for the exterior cleaning of electrical equipment; these agents should only be used according to the manufacturer's instructions.

- Gently pat down and wipe the equipment with a soft material (gauze 4x4) to remove any gross debris.
- When cleaning a Video Processor, **do not** wipe the screen with alcohol or any other cleaning agent not confirmed to be compatible for LCD cleaning.
- Gently wipe all external surfaces with 70% isopropyl alcohol or an enzymatic cleaning solution designed for electrical equipment.
- Dry all external surfaces of the Video Processor.

Disinfecting the Processor

The Video Processor should only be disinfected with agents designed for external surface disinfection of electrical equipment; these agents should only be used according to the manufacturer's instructions.

- Clean the Video Processor as described in the previous section.
- Carefully wipe the Video Processor with a surface disinfectant that is compatible with electronic equipment. Do not allow fluids to get into electrical connectors.
- Allow the Video Processor to remain exposed to the disinfectant for the period of time recommended by the disinfectant manufacturer.
- Carefully wipe the Video Processor with 70% isopropyl alcohol then wipe all outside surfaces of Video Processor with soft, dry material (gauze 4x4) until completely dry.
- Ensure that the Processor has no disinfectant solution residues on it.

Sterilizing the Processor

The Video Processor **cannot be sterilized** using traditional methods. For more information, contact your Cogentix Medical Customer Service representative.

Maintenance and Repair

The Video Processor and accessories should be inspected for operation and safety. Although not essential, preventive maintenance can identify potential problems before they happen, ensuring that the Processor has a long and reliable operating life.

Maintenance and Storage

Defective items must be serviced and repaired exclusively by persons authorized by Cogentix Medical. All repair work shall employ original manufacturer's parts only.

Alterations/modifications to the equipment should **NEVER** be made by unauthorized personnel. Repairs should only be performed by an authorized Cogentix Medical service facility.

Replacing the Fuses

Qualified personnel can replace fuses when necessary. Refer to Figure 8-1 to locate the fuse holder. Replace both fuses at the same time (Type T4AH, Slow Blow 4A, 250V, High Breaking Capacity, 5x20mm size).

1. Ensure that the power switch on the front panel is in the OFF position.
2. Disconnect the power cord from the processor.
3. The Fuse Module is located directly above the power cord receptacle.
4. Extract the fuse module using a screwdriver.
5. Replace only with identical type fuses. (Type T4AH, Slow Blow, High Breaking Capacity, 4A 250V).
6. Remove the two old fuses and insert two new fuses into the appropriate clips of the fuse module.
7. Align with the entry module and push the fuse module back into place.

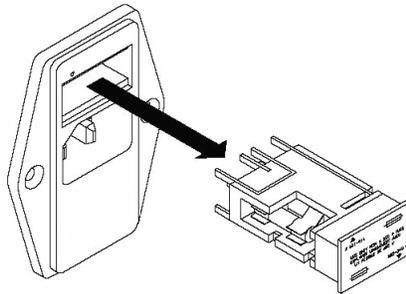


Fig. 8-1: Fuse Replacement

Storage

- This equipment should **NEVER** be stored in areas where the unit could get **wet** or be exposed to adverse environmental conditions such as high temperature, humidity, direct sunlight, dust, salt, etc.
- This equipment should **NEVER** be stored in the presence of flammable or explosive gases, or chemicals.
- This equipment should **NEVER** be stored or transported in an inclined position, nor should it be subjected to impact or vibration.
- Cords, accessories, etc. should be wiped clean and neatly stored.
- This equipment should be maintained in a clean condition during storage to be ready for subsequent use.

- Never store the Video Processor with the LCD display open.
- Do not stack or place items on top of the closed LCD display.

Disposal

The equipment should be returned to Cogentix Medical for disposal. Contact your local Cogentix Medical representative or Cogentix Medical Customer Service.

9 Troubleshooting

The table in this chapter is intended to help users diagnose problems that may occur during operation of the Video Processor. It addresses some of the problems that could arise during operation, and suggests corrective actions.

If the suggested corrective action does not solve the problem, contact your local distributor or Cogentix Medical at 866 258-2182 (toll free in U.S.) or (+1) 952 426-6189 (international calls).

CAUTION If the problem persists even after the corrective action has been taken, or a problem occurs that is not covered in the tables, do not use the Video Processor. Contact Cogentix Medical for repairs using the information given in Chapter 10, *Warranty and Service*.

DPU-7000 Series Video Processors require a Cogentix Medical endoscope (or other cleared videoscope) for proper operation. In order to identify issues related to image problems, you may also have to refer to the Troubleshooting Chapter in the User's Manual of the endoscope that is connected to the Video Processor.

Troubleshooting

Image Issues		
PROBLEM	POSSIBLE CAUSE	SUGGESTED ACTION
No Image	DPU power is not on	Turn DPU power switch on
		Check power cord connection and fuses, or connect the DPU to a different wall outlet
	External monitor power is not on	Turn monitor power switch on
	Endoscope is not connected properly to the DPU	Ensure scope is properly connected to the DPU
	Cables running from the DPU to external monitor are damaged or improperly connected	Inspect cables to ensure they are not damaged and are properly connected. Cable may need to be replaced, or use an alternate video output from the DPU.
	Endoscope is damaged	Send the endoscope and DPU to Cogentix Medical for repair
Image is too dark	Internal cables connecting the DPU to the integrated LCD monitor are damaged	DPU should be returned for Cogentix Medical for repair
	Light intensity setting is too low	Increase the light intensity setting up to a maximum value of eight
	Brightness/BackLight/Contrast setting on Monitor or LCD is too low	Increase the brightness setting on the DPU first, then try to increase the brightness/contrast or back light setting on the LCD monitor
	Debris is covering the distal tip of the scope	Clear the sheath window or the distal tip of the scope
	Light guide fiberoptic bundle may be damaged	Check the distal end of the endoscope to ensure that light is coming out from the light guide bundles. (Do not look directly into the light guide bundles) If no light is visible, the endoscope should be sent back to Cogentix Medical for repair.
	Patient material or other substance on the Light Guides	Clean the Distal Tip with an alcohol prep pad to remove material or stain. Excess staining may not be correctable or the lens may require replacement.
Image on LCD is a solid light blue	Internal light source is deteriorating.	Return the endoscope to Cogentix Medical for repair.
	There may be a problem with the connection from the processor to the integrated LCD.	Return the DPU to Cogentix Medical for evaluation and/or repair.

Table 9-1: Troubleshooting

Image Issues		
PROBLEM	POSSIBLE CAUSE	SUGGESTED ACTION
Image colors are not accurate	Settings on the LCD monitor are not correct, including Brightness and Contrast	Reset the LCD settings back to the factory default settings as per Cogentix Medical recommendations.
	Endoscope has not been properly white balanced	Perform another Auto-White Balance.
	Colors are too saturated or not saturated enough	Adjust Color Intensity for all colors displayed, or only Red or Blue from the Image drop down menu.
	Cables from the DPU to the external monitor are not connected properly, or are damaged	Inspect cables to ensure they are not damaged and are properly connected. Cable may need to be replaced, or use an alternate video output from the DPU.
Image is black and white	Endoscope is not connected properly to the DPU	Ensure scope is properly connected to the DPU.
	LCD monitor or external monitor settings are incorrect	Adjust the settings back to the factory default settings.
	Scope or DPU is damaged	Send the endoscope and DPU to Cogentix Medical for repair.
Image quality Is poor	Endoscope has not been properly white-balanced	Perform another auto-white balance.
	Endoscope is not connected properly to the DPU	Ensure scope is properly connected to the DPU.
	Enhancement or other image settings on the DPU are not set correctly	Change the settings on the DPU.
	Settings on monitor are incorrect	Check settings on monitor and set to Cogentix Medical factory default settings.
	The endoscope image is being affected by another device (e.g. ESU)	Make sure that the DPU and ESU devices are connected to different circuits. An isolation transformer may be required. Place electrical equipment as far away from the endoscopy equipment as possible.
	Cables running from the DPU to monitor are damaged or improperly connected	Inspect cables to ensure they are not damaged and are properly connected. Cable may need to be replaced or use an alternate video output from DPU.
	Endoscope is damaged	Send the endoscope and DPU to Cogentix Medical for repair.
Patient debris or other material on the Objective Lens	Clean the Distal Tip with an alcohol prep pad to remove material or stain. Excess staining may not be correctable or the lens may require replacement.	

Table 9-1: Troubleshooting Cont'd

Troubleshooting

Image Issues		
PROBLEM	POSSIBLE CAUSE	SUGGESTED ACTION
Image has blooming	The shutter speed or light intensity may not be set properly	Set the Light Intensity to Auto
	The shutter window may not be set properly	Set the shutter window to Medium or Full
	Peak/Ave may be set too low	Adjust Peak/Ave setting to 50/50 or higher (up to 10/90).
	The Digital Processing Unit is not functioning properly	Return the DPU and endoscope to Cogentix Medical for repair.
Cannot print images from an SD card directly to a printer	This application is not supported	You must insert the SD card into a PC and save the images or print the images from a PC.
Processor or keyboard locked up	Corrupted SD card or other SD card problem	Install new SD card
	Software glitch has interrupted functions	Power DPU off for 30 seconds, then restart.
DPU-7000A Error Messages		
Scope or camera not connected	Endoscope plug is not completely inserted into the DPU	Reconnect endoscope plug to the DPU.
Camera head not compatible	The camera head or endoscope is not connected properly to the DPU	Re-connect the camera head or endoscope to the DPU.
	The camera head or endoscope is not compatible with the DPU	Contact Cogentix Medical to confirm the camera head or endoscope is compatible with DPU.
WB failed	The scope's distal head was not held steady long enough for the white balance to complete the cycle	Perform the white balance again and wait for W/B OK completion message. If W/B Failed message occurs, try again, or contact Cogentix Medical for technical support.
Videoscope not initialized	Endoscope is not connected properly to the DPU	Reinsert the endoscope plug into the DPU. Turn off processor and re-start.
	Scope sensor or electronics may be damaged	Return the endoscope to Cogentix Medical for repair.
Buttons are not responding	Endoscope button is stuck	Check the buttons, they should move freely.
	Endoscope plug is not completely inserted into the DPU	Reconnect endoscope to the DPU. Ensure DPU is powered off before inserting plug.
	Button is set to Disabled	Check settings in Button menu

Table 9-1: Troubleshooting Cont'd

DPU-7000A Error Messages		
PROBLEM	POSSIBLE CAUSE	SUGGESTED ACTION
Missing patient data (Name, ID and DOB)	Patient data was not input during set-up	Enter patient ID, name and DOB
Missing / faulty SD card	The SD card was not installed in the DPU	Insert the SD card
	SD card is defective	Replace the SD card
Error reading SD card	The SD card is not properly installed in the DPU	Reinsert the SD card into the DPU
	The SD card is defective	Remove the SD card and place it in your PC. Save the contents of the SD card to your PC and clear the images off the SD card. Reformat the SD card on the PC or replace.
Not recording, SD card is full	There are too many images stored on the SD card	Remove SD card and save images to a PC.
		Erase files from the SD Card and reinsert into the DPU, or use new SD card.
Initialize error SD card	SD card is defective	Replace the SD card
SD Card is Read Only	Write Protect (Lock) switch is set on SD card	Remove SD card and check setting of Write Protect switch.
Endoscope Issues		
Endoscope plug will not fit into DPU	The sealing cap has not been removed from the endoscope	Remove the sealing cap from the endoscope prior to connecting it to the DPU.
	Endoscope plug or DPU connector is damaged	Try to insert another endoscope into the DPU; if you cannot fit the video connector of either scope into the DPU, return the DPU or endoscope to Cogentix Medical for repair.

Table 9-1: Troubleshooting Cont'd

10 Warranty and Service

Warranty Information



NOTE: Alterations or repairs performed by persons not authorized by Cogentix Medical will void the warranty defined herein.

Cogentix Medical is not liable for damage to the **DPU-7000A** Digital Video Processor resulting from misuse, negligence, or improper cleaning or storage. The warranty defined herein shall apply only to the original buyer. In no event shall Cogentix Medical be liable for anticipated profits, consequential damages or lost time incurred by the buyer with the purchase or use of this equipment.

Cogentix Medical sells many of its products through regional distributors. Before sending equipment to Cogentix Medical, contact your regional distributor for repair/return procedures.

Cogentix Medical warrants that the **DPU-7000A** Digital Video Processor and its accessories will be free from defects in materials and workmanship **for a period of one year from the date of the invoice**. Replacement parts are warranted **for a period of ninety (90) days from the date of the invoice**.

All non-warranty repairs will be warranted to be free from defects in materials and workmanship **for a period of ninety (90) days from the date of the invoice**.

Upon receipt of the **DPU-7000A** Digital Video Processor for repair, Cogentix Medical will evaluate the equipment and make the final decision as to the warranty status.

The above warranties are in lieu of all other warranties, either expressed or implied, including warranties of fitness or merchantability.

Cogentix Medical Service Information

DPU-7000A Digital Video Processors are serviced at authorized Cogentix Medical repair facilities only. Use the following procedure to expedite returned goods for repair or replacement:

- Telephone your Regional Distributor, Territory Manager, or Cogentix Medical Customer Service Monday through Friday from 8:00 AM to 7:00 PM EST.
 - USA customers call **1-866-258-2182**
 - International customers call **(+1) 952-426-6189** for Cogentix Medical Customer Service or call your regional distributor

Provide a detailed description of the problem.

Warranty and Service

- If troubleshooting cannot solve the problem, a Returned Goods Authorization (RGA) number will be issued.
- Complete an Incident Report Form and send it to Cogentix Medical along with the returned equipment. Returned merchandise will only be accepted with an RGA number.

Shipping to Cogentix Medical or Distributor



If the **DPU-7000A** Digital Video Processor has been used in a clinical setting, disinfect all system components before shipping as described in Chapter 8, *Maintenance and Storage*. Shipping contaminated equipment presents an acute infection-control risk for those handling the Video Processor, both during shipping and at Cogentix Medical or authorized repair facility.

If the **DPU-7000A** Digital Video Processor has been used in a clinical setting but cannot be disinfected before shipping, place a red biohazard label on the shipping container to indicate that the contents are contaminated, in accordance with OSHA standards 29 CFR 1910.1030.

Observe the following precautions before shipping the Video Processor.

The Video Processor or any other Cogentix Medical equipment must be shipped in the original box with the original protective foam endcaps to prevent damage during shipment. If the original packaging is not available at the time of shipping, contact your regional distributor or Cogentix Medical Customer Service Department to obtain replacement packaging. **The customer will be responsible for the cost of all replacement materials.**

Regardless of warranty status, all shipping charges to and from an authorized Cogentix Medical facility are the responsibility of the customer.



NOTE: The customer will be contacted and advised of the estimated repair costs. Repairs will not begin on any equipment until authorization or a purchase order has been issued indicating approval of the charges.

Appendix / Specifications

Item	Specification
Scanning System	2:1 interlace
Gain Control	Automatic Gain Control and Manual Gain Boost
White Balance	Fast Auto White Balance
Electronic Shutter	Automatic windowed shutter 1/50 (PAL) or 1/60 (NTSC) to 1/100,000 seconds
Digital Still/Video Capture	Secure Digital (SD or SDHC) Card
Video Outputs	Digital: <ul style="list-style-type: none"> • HDMI Analog: <ul style="list-style-type: none"> • VGA • Y/C (S-Video) Y=1.0V, C(Burst)=0.3V pp @ 75Ω, Sync=2.1V pp @ 75Ω • RGBS • Composite
Power Supply	100-240 VAC @ 50/60 Hz automatic
Power Consumption	100 VA
Regulatory Approvals	<ul style="list-style-type: none"> • ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) including Deviations for U.S. • CAN/CSA-C22.2 No. 60601-1 (2008) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) including National Differences for Canada. • The system has also been assessed to and complies with UL 60601-1, 1st Edition, 2006-04-26 and CAN/CSA-C22.2 No. 601.1-M90, 2005.
Degree of Protection Against Electric Shock	Type BF (Body Floating)
Equipment Class	Class 1
Mode of Operation	Continuous
Water Resistant	Processor control unit - Not Protected Equipment, Class IPX0
Operating Environment	Temperature 50° to 104° F (10° to 40° C) Relative Humidity 30 to 85% Air Pressure 700 to 1060 hPa Pollution Degree 2 Altitude 2000m (max) Overvoltage Category II
Storage Environment	Temperature -4° to 140° F (-20° to +60° C) Relative Humidity 0 to 95% Air Pressure 700 to 1060 hPa
Processor Dimensions	DPU-7000A: 384 x 340 x 117 (W x D x H)
Processor Weight	DPU-7000A: 8kg (17.6 lbs.)

Table A-1: Specifications

DPU-7000A System Parameter Default Settings

Parameter	Default Value
Enhance	Medium
Light Intensity	Auto
Brightness	0
Gain	Off
Orientation	Normal
Zoom	1.0
Peak Average	50/50
Shutter Window	Medium
Shutter Speed	Auto
Color Red	0
Color Blue	0
Color Intensity	0
Display Patient Data	All
Display Clock	On
Display User	On
Display Comments	On
Zoom Indicator	On
Orientation Indicator	On
Strobe Data	On
Button Labels	On
PIP Location	Lower Right
Freeze Mode	Field
Volume	5
Key Click	Off
Button 1	Freeze
Button 2	Enhance
Button 3	Image Capture
Button 4	Video Capture
Pedal Left	Image Capture
Pedal Right	Video Capture
Date Format	MM/DD/YYYY
Time Format	12 Hour
Stop Watch	Off
Language	English
Built In Keyboard	Enabled

Table A-2: System Parameter Default Settings

Function Key Comparison DPU-7000A Keyboard vs. External Keyboard

VSI Built-In Custom Keyboard	Off the Shelf External Keyboard	Description
Patient Entry	F1	Opens the patient entry screen.
Day List	F2	Opens the Day List entry screen, keeps it on-screen for 5 seconds. Another press on this key while Day List is still displayed will advance to the next name on the list. When reaching the end, will rotate to the first name. Pressing the up/down buttons on the keyboard while list is displayed will move up/down the list.
User Select	F3	Opens the User selection screen, keeps it on-screen for 5 seconds. Another press on this key while User List is still displayed will advance to the next name on the list. When reaching the end, will rotate to the first name. Pressing the up/down buttons on the keyboard while list is displayed will move up/down the list.
Text On/Off	F4	Shows/Hides all on-screen text overlaid on the video image.
Int/Ext Video	F5	Switch between displaying the video signal from the scope or from an auxiliary source through the Y/C video input. This is required to review video recorded on external sources on the LCD display.
Archive Menu	F6	Shows current patient's archived files. If no patient is actively selected, pressing this key will bring up Archive Search screen.
Last Record	F7	Jumps to display the last (most recent) media recorded (e.g. image or video).
Jump to Start	F8	When this key is pressed during video playback, it jumps to the beginning of the video and stops. Press it again, and it jumps to the previous video recording or still image.
Jump to End	F9	When this key is pressed during video playback, it jumps to the end of the video and stops. Press it again, and it jumps to the next video recording or still image.

Table A-3: Function Key Comparison

Appendix

VSI Built-In Custom Keyboard	Off the Shelf External Keyboard	Description
Play/Pause	F10	Play/Pause video playback of current file.
Stop	F11	Stops playback and jumps to the start of the video file.
Variable Speed Playback / Slower	F12	While playing a video recording, pressing this key will slow down playback from 1x to ½ x to ¼ x to ⅛ x speed.
Variable Speed Playback / Faster	PrintScrn	While playing a video recording, pressing this key will increase playback speed up to 1x.
Volume Down / SK1	Scroll Lock	Decreases the audio volume level over 10 steps; also used to tag an image for Multi-Image Display.
Volume Up / SK2	Pause/Break	Increases the audio volume level over 10 steps; also used to tag a second image for Multi-Image Display.
Mute / SK3	Insert	Mutes and unmutes the audio output; also used to tag a third image for Multi-Image Display.
Delete / SK4	Delete	Delete character during data entry.
Home/Light Intensity Up	Home	Increases the light intensity over 8 steps. When light intensity is set to Auto the Front Panel keypad Auto LED is on. Also used as Home key when editing text. In Archive or Patient File List screen, Home key takes user to beginning of list.
Page Up/Light Intensity Down	PgUp	Decreases the light intensity over 8 steps from Auto to 8 down to 1. Also used as Page Up key when editing text. In Archive or Patient File List screen, Page Up key moves user up one screen.
Page Down/Zoom In	PgDn	Increases the Zoom level in steps of 0.1 from 1.0 to 2.0 times magnification. Also used as PgDn key when editing text. In Archive or Patient File List screen, Page Down key moves user down one screen.
End/Zoom Out	End	Decreases the Zoom level in steps of 0.1 from 2.0 to 1.0 times magnification. Also used as End key when editing text. In Archive or Patient File List screen, End key takes user to the end of the list.

VSI Built-In Custom Keyboard	Off the Shelf External Keyboard	Description
Menu	Left Ctrl Key	Opens the Menu system allowing access to system settings, user and patient entry and selection screens, archive functions, and image management features.
Remote	Left "Windows" Key	Triggers a remote peripheral function (video printer, external video recorder, etc.).
Print	Tilde Key (~)	Prints the screen as currently displayed.
Still Image	Left Alt Key	Captures the current image to the patient's folder as currently displayed (with all on-screen display).
Space/Freeze	Space	Freeze the current image and initiate Picture-in-Picture Mode. Pressing the key again will end the Freeze Mode. In text entry, acts as space bar to add a space character.
Video	Right Alt Key	Starts/stops video capture to the current patient's folder, as currently displayed (with all on-screen display).
Enhance	Right "Windows" Key	Rotates through the Enhance modes (Off, Low, Medium, High).
Gain	Menu	Toggle Gain On/Off. When on, the Front Panel Keyboard Gain LED is on.
Strobe	Right Ctrl Key	Toggle Strobe On/Off.
Air / Left Arrow	Left Arrow	Turns Air Pump On/Off Acts as Left Arrow during text entry, editing, and navigating through the menu system.
Image Orient / Down Arrow	Down Arrow	Image Orientation – switch between normal and flipped. This rotates the image 180° for users holding the scope handle turned 180°. Acts as Down Arrow during text entry, editing, and navigating through the menu system.

Appendix

VSI Built-In Custom Keyboard	Off the Shelf External Keyboard	Description
White Balance / Right Arrow	Right Arrow	To perform White Balance, press and hold for 2 seconds to activate. Shows a message while in progress and a successful or failed message. Acts as Right Arrow during text entry, editing, and navigating through the menu system.
Up Arrow	Up Arrow	Serves as up arrow directional cursor only.
Enter	Enter	When in Menu mode, press Enter to select highlighted option. Press Enter when in confirmation screen to accept displayed option.
Back Space	Back Space	Use Backspace key to move one character back when entering/editing text in entry screens.

Electromagnetic Compatibility Declarations



Use of accessories not specified in this manual or sold by Cogentix Medical may result in increased electromagnetic emissions or decreased immunity of the equipment or system.

Guidance and manufacturer's declaration – electromagnetic emissions		
The Videoscope connected to the DPU-7000 Series Video Processor [the "System"] is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is always used in such environments.		
Emissions Test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The System uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The System is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Table A-4: Electromagnetic Emissions Declaration

Appendix

Guidance and manufacturer's declaration – electromagnetic immunity			
The Videoscope connected to the DPU-7000 Series Video Processor [the "System"] is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is always used in such environments.			
Immunity Test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines ±1 kV for input/output lines	±2kV for power supply lines ±1 kV for input/output lines	Main power quality should be that of a standard commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Main power quality should be that of a standard commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	>95% dip U_T for 0.5 cycle 60% dip U_T for 5 cycles 30% dip U_T for 25 cycles 95% dip U_T for 5 sec	Compliant with all levels of voltage dips for $U_T = 100$ VAC and $U_T = 240$ VAC	Main power quality should be that of a typical commercial or hospital environment. If the user of the System requires continued operation during power interrupts, it is recommended that the System be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a standard commercial or hospital environment.

Table A-5: Electromagnetic Immunity Declaration

Guidance and manufacturer’s declaration – electromagnetic immunity			
The Videoscope connected to the DPU-7000 Series Video Processor [the “System”] is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is always used in such environments.			
Immunity Test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the System, including cables, than the recommend separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.17\sqrt{P}$ $d = 1.17\sqrt{P}$ 80MHz to 800MHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 2.33\sqrt{P}$ 800MHz to 2.5GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitter, as determined by an electromagnetic site survey ^a should be less than the compliance level in each frequency range. ^b Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1: At 80 MHz and 800 MHz the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

Table A-6: Electromagnetic Immunity Declaration

Appendix

^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the System is used exceeds the applicable RF compliance level above, the System should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary such as re-orienting or relocating the System.

^b Over the frequency range 150 KHz to 80 MHz, field strengths should be less than 3 v/m.

Table A-6: Electromagnetic Immunity Declaration Cont'd

Recommended separation distances between portable and mobile RF communications equipment and the System			
The Videoscope connected to the DPU-7000 Series Video Processor [the "System"] is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the System as recommended below according to the maximum output power of the communications equipment.			
Radiated maximum output power of transmitter P [W]	Separation distance according to frequency of transmitter d [m]		
	150 KHz to 80 MHz $d = [3.5/V_1]\sqrt{P}$	80 MHz to 800 MHz $d = [3.5/E_1]\sqrt{P}$	800 MHz to 2.5 GHz $d = [7/E_1]\sqrt{P}$
0.01	d = 0.12	d = 0.12	d = 0.23
0.1	d = 0.37	d = 0.37	d = 0.74
1	d = 1.17	d = 1.17	d = 2.33
10	d = 3.69	d = 3.69	d = 7.38
100	d = 11.67	d = 11.67	d = 23.33
For transmitters rated at a maximum output power not listed above, the recommended separation distance, d, in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1:	At 80 MHz and 800 MHz the separation distance for the higher frequency range applies.		
NOTE 2:	These guidances may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		

Table A-7: Recommended Separation Distances

Cogentix

Medical



Cogentix Medical, Inc.

40 Ramland Road South
Orangeburg, NY 10962 USA
Tel. 866 258-2182 (toll free in U.S.)
Tel. (+1) 952 426-6189 (international calls)
Fax. 866 255-4522 (toll free in U.S.)
Fax. (+1) 952 426-6199 (international faxes)
E-Mail: customercare@kogentixmedical.com

www.kogentixmedical.com

For additional product information or questions pertaining to sales and service, please contact the local distributor or the manufacturer.



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