

26" RADIANCE D HB  
High-Definition



USER MANUAL



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## 1

## Warnings and Cautions



This symbol alerts the user that important information regarding the installation and / or operation of this equipment follows. Information preceded by this symbol should be read carefully in order to avoid damaging the equipment.



This symbol warns user that un-insulated voltage within the unit may have sufficient magnitude to cause electrical shock. Therefore, it is dangerous to make contact with any part inside the unit. To reduce the risk of electric shock, **DO NOT** remove cover (or back). There are no user serviceable parts inside. Refer servicing to qualified service personnel.



This symbol cautions the user that important information regarding the operation and / or maintenance of this equipment has been included. Information preceded by this symbol should be read carefully to avoid damage to the equipment.



This symbol denotes the manufacturer.



This symbol denotes the manufacturer's European Community representative.

To prevent fire or shock hazards, do not expose this unit to rain or moisture. Also, do not use this unit's polarized plug with an extension cord receptacle or other outlets unless the prongs can be fully inserted. The product is designed to meet the medical safety requirements for a patient vicinity device.

This equipment/system is intended for use by healthcare professionals only.



#### Safety Compliance:

This product is T.U.V. approved WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1/CAN/CSA C22.2 NO. 60601-1 and ANSI/AAMI ES60601-1.



#### Safety Compliance:

This product meets the requirements of EN-60601-1 so as to conform to the Medical Device Directive 93/42/EEC and 2007/47/EC (general safety information).



#### Safety and EMI Compliance: GB9254, GB4943 and GB17625

声明

此为A级产品。在生活环境中,该产品可能会造成无线电干扰。在这种情况下,可能需要用户对其干扰采取切实可行的措施。

This product complies to the above standards **only** when used with the supplied medical grade power supply.

**Power Supply:** BridgePower BPM150S24F06

**AC Input:** 100 to 240 Volts at 50 to 60 Hz.

**DC Output:** 24 volts at 6.25 amps

**Power Cord:** Use a hospital grade power cord with the correct plug for your power source.

Disconnect the power cord from the AC mains. The power cord is the only recognized disconnect device.

The MEDICAL EQUIPMENT should be positioned so that its disconnect device is readily accessible.

The product should be powered from a center tapped circuit when used in the US at voltages over 120 volts. Product is intended for continuous operation.

This product is energized from an external electrical power source for class 1 equipment. It is the responsibility of the installer to test the product's earth ground to verify that it complies with the hospital, local and national impedance requirements.

A ground post, located on the back of the product, may be used for the purpose of grounding the unit's chassis. Any such ground must be installed in accordance with applicable electrical codes. The ground post is shown on the mechanical drawing found on page 2.

#### Recycling:



Follow local governing ordinances and recycling plans regarding the recycling or disposal of this equipment.

## Declarations of Conformity

### FCC and Council Directives of European Standards:

This device complies with Part 15 of FCC rules and 93/42/EEC and 2007/47/EC of the Council Directives of European Standards. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable results.

1. Use the attached specified cables with the color product so as not to interfere with radio and television reception. Use of other cable and adapters may cause interference with other electronic equipment.
2. This equipment has been tested and found to comply with the limits pursuant to FCC part 15 and CISPR 11. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

### IEC:

This equipment has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity.

### FCC, Council Directives of European Standards and IEC:

There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

Accessory equipment connected to this product must be certified according to the respective IEC Standards (i.e., IEC 60950-1) for data processing equipment and IEC 60601-1 for medical equipment). Furthermore, all configurations shall comply with the system standard, IEC 60601-1-1. Anyone who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of system standard IEC 60601-1-1. Whoever is responsible for securing the product to a system needs to insure that the mounting equipment used with this product complies to IEC standard 60601-1. If in doubt, consult the technical services department or your local representative.

## Legal Statement

NDS sells its products through other medical device manufacturers, distributors and resellers and therefore, purchasers of this NDS product should consult with the entity through which this product was originally purchased regarding the terms of any applicable product warranties provided by such entity, if any.

NDS neither assumes nor authorizes any person to assume for it any other liabilities in conjunction with and/or related to the sale and/or use of its products. To ensure proper use, handling and care of NDS products, customers should consult the product specific literature, instruction manual, and/or labeling included with the product or otherwise available.

Customers are cautioned that system configuration, software, the application, customer data and operator control of the system, among other factors, affect the product's performance. While NDS products are considered to be compatible with many systems, specific functional implementation by customers may vary. Therefore, suitability of a product for a specific purpose or application must be determined by the consumer and is not warranted by NDS.

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## About This Manual

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This manual is designed to assist the user with proper installation, setup and operation of the display. Depending on the model and options that were purchased, some of the features and options in this manual may not apply to the display you are using.

A numbered tab on the side of the page denotes the beginning of a section.

The functional descriptions in this manual are representative of:

Part Numbers: 90R0054

Firmware BIOS: 58M0003 Version A and later.

Manual Part Number: 60G0440 Rev C

## Intended Use and Contraindications

### Intended Use:

This monitor is intended for use in a medical environment to display high quality video and graphic images .

### Contraindications:

The monitor may not be used in the presence of flammable anesthetics mixture with air, oxygen or nitrous oxide.

No part of this product may come in contact with a patient. Never touch the product and a patient at the same time.

For mission critical applications, we strongly recommend that a replacement unit be immediately available.

## Quick Startup

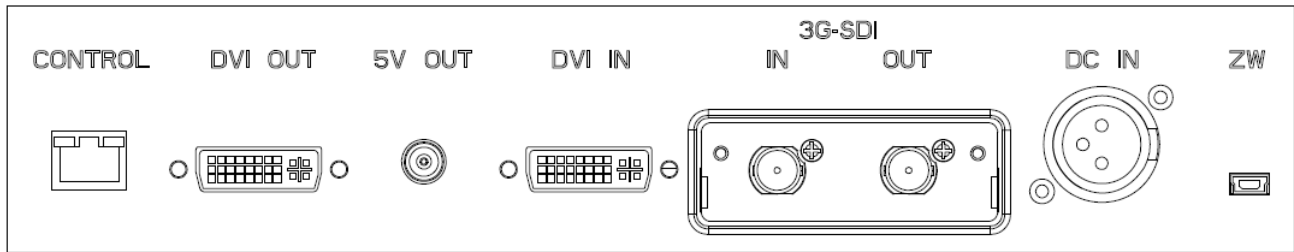
### Powering On The Unit:

Connect the power supply to the display via the power plug. Plug in the AC adapter. Connect a video source to the display. Apply power to the peripheral device, then to the display. The NDS logo is displayed, followed shortly by video.

### First time users and initial test:

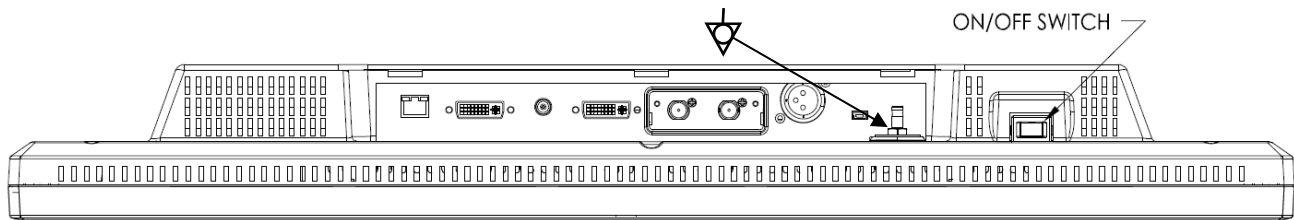
Visually, Flat-Panel (LCD) images will look crisper than those of a traditional CRT. For the same reason, live video may appear a little blocky. Users not familiar with the image differences should familiarize themselves before utilization in a critical application and determine its usability. It is recommended that first time users view the display next to a CRT to familiarize themselves with any subtle differences in viewing quality.





### Notes

1. The connector panel is shown as it appears with the display laying on its face.
2. The **3G-SDI** module is factory installed.
3. **DVI OUT** and **3G-SDI OUT** are always active when the display is powered on.
4. The **RJ-45** connector is used to install **BIOS** upgrades.
5. The **5V DC OUT** provides power for auxiliary devices whose current draw is less than 1 Amp. See page 9 for pin out and mating connector details.
6. The **ZW** connector is for future use.

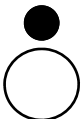


## Electrical Symbols



### Equipotentiality:

This symbol appears next to the display's potential equalization connector. (ground post)



### Open (Off) Switch:

This symbol appears on the open, or off, side of the display's rocker switch.



### Closed (On) Switch:

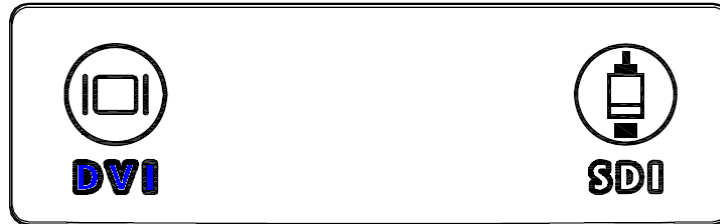
This symbol appears on the closed, or on, side of the display's rocker switch.

## Control

The display accepts a **DVI** input or a **3G-SDI** input.

Press the keypad's **DVI** button to select the **DVI** input, the DVI legend will be illuminated by a blue LED. Press the **3G** button to select the **3G-SDI** input, the 3G legend will be illuminated by a blue LED. Only the selected input is illuminated. If a signal is connected to the selected input, the LED in the lower front right corner of the display will turn blue. If no signal is applied to the selected input the LED will turn orange when the display goes into **Power-Save Mode**.

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## Service Menu

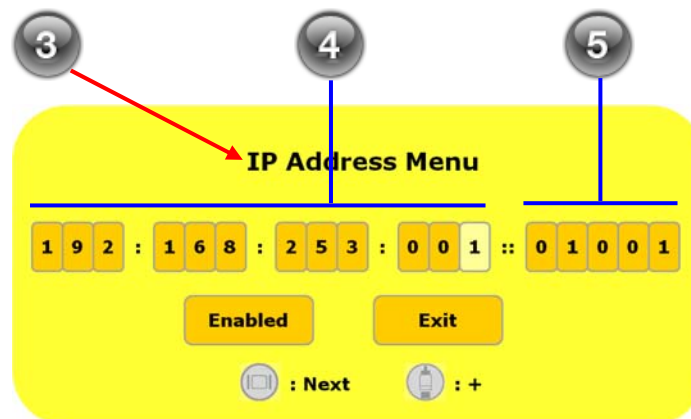
The **Service Menu** allows you to set the display's **IP Address** or select the **Color Standard** to be used. Setting the **Color Standard** is described on the following page.

- 1 To access the **Service Menu** press and hold both the **SDI** and the **DVI** buttons during power up. The **Service Menu** should appear on a black background with its **IP Address** button high lighted.
- 2 Press the **Next** (DVI) button to select **Color Standard** or **End**. Pressing the **Next** button on **End** moves the cursor back to **IP Address**. To exit the **Service Menu**, select **End** then press the **Enter** (SDI) button.
- 3 With the **IP Address** button highlighted, press the **Enter** button to open the **IP Address Menu**.

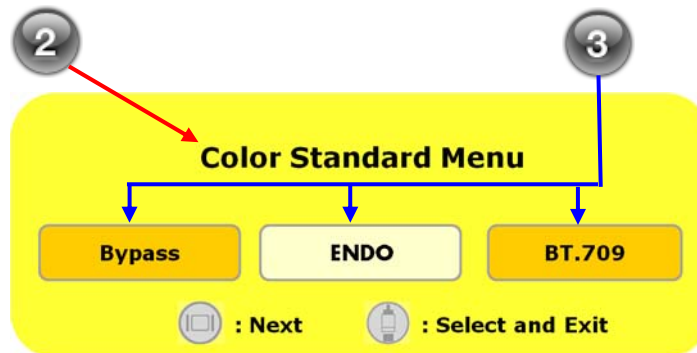
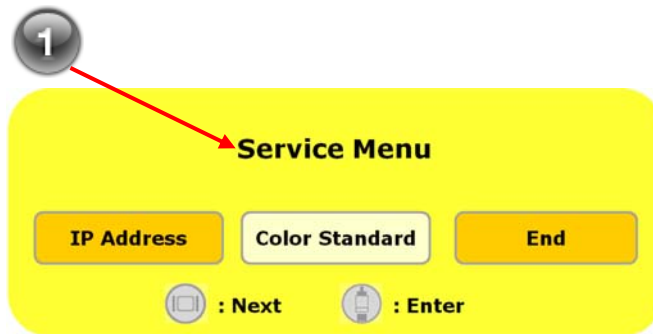


- 4 The IP address consists of 4 blocks of 3 digits each, each block may have a value of 0 to 255. Press the **Next** (DVI) button until the first digit of the first IP address block is highlighted, then press the **+** (SDI) button to set the first IP address digit. Press **Next** to select the next digit, then press **+** to set it. Continue until all the IP address digits have been entered. **Note:** If the first digit in a given block is 2 then the second and third digits cannot be greater than 5.
- 5 The port address is set the same way as the IP address was set. The port address may be set to any value from 0 to 65535.

**Note:** An IP address and a port address may be obtained from your Network Administrator.



- 1 From the **Service Menu** press **Next** (DVI) to select **Color Standard**, then press **Enter** (SDI) to open the **Color Standard Menu**.
- 2 The highlighted button in the **Color Standard Menu** is the current color standard.
- 3 To change color standard press the **Next** (DVI) button until the desired standard is highlighted. Pressing the **Next** (DVI) button when **BT.709** is highlighted moves the highlight to **Bypass**. When the desired standard is highlighted, press the **Select and Exit** (SDI) button to select the standard, close the **Color Standard Menu**, and return to the **Service Menu**.



## Troubleshooting Section

### Black Screen:

If the LED in the front lower right corner is orange then the display is in **Power-Save Mode**. Connect a **DVI** signal to the **DVI** connector. If an image does not appear, press the **DVI** button twice, the label under the **DVI** button should turn blue and an image should be displayed and the LED will turn blue. If an image is not displayed, turn the display Off and On. If the NDS logo appears then the display is working properly.

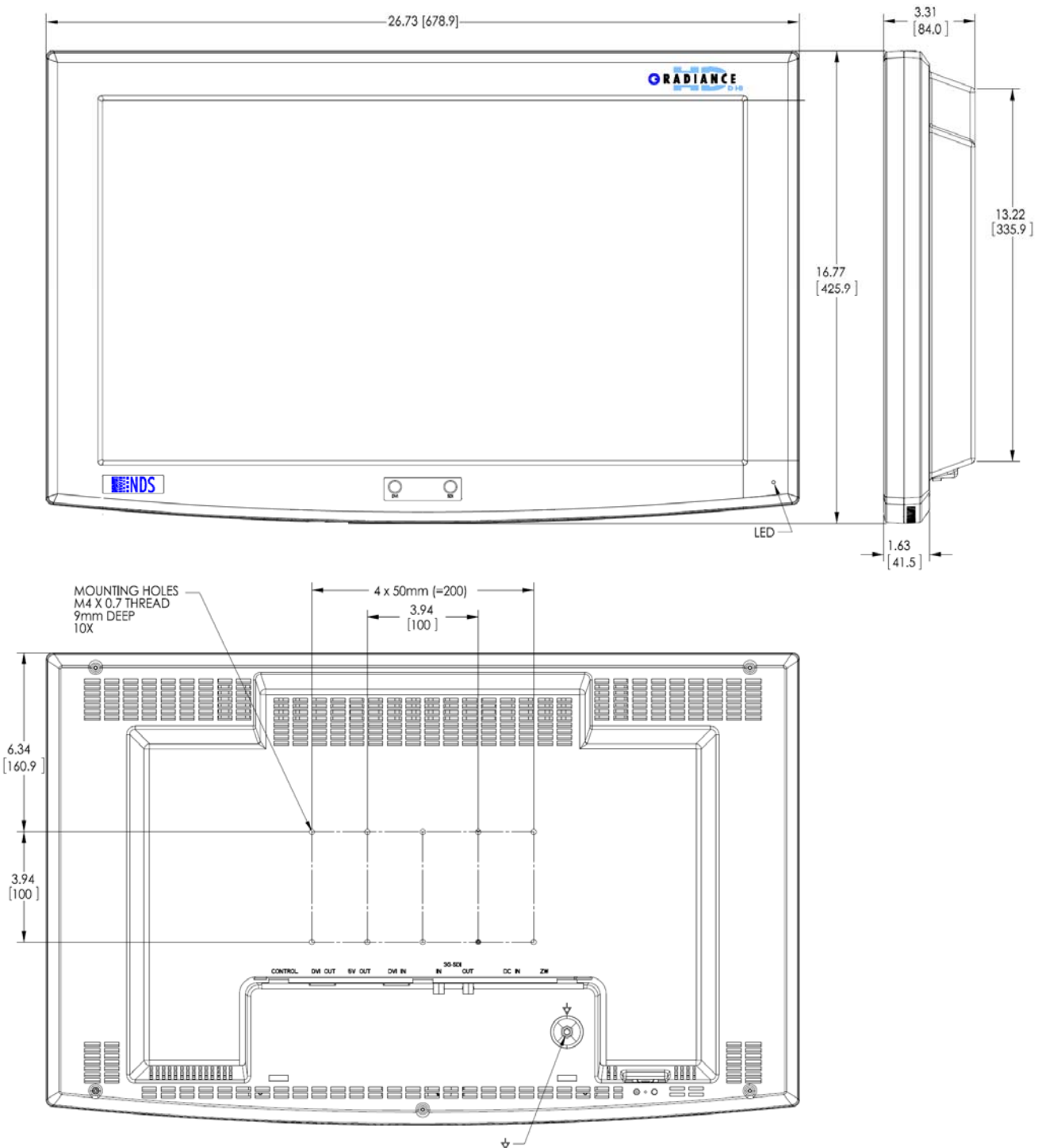
### Searching:

A "Searching" message in the lower right hand corner of the display means that the video source is not being detected. Verify that the video source is functioning correctly and that the cable connecting it to the display is not damaged.

### LED is Orange and Blinking:

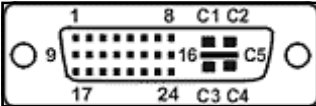
This condition may be caused by low voltage or current delivered to the display. If you are using an AC or DC extension cord, Verify that it is connected properly and that its conductors are large enough to deliver sufficient current to operate the display. The AC and DC power consumption values are listed in the **Specifications** table on page 10.

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The display, shown above, has a standard 100mm VESA mount allowing convenient system integration of the vertically positioned display. We recommend that the installation be performed by a qualified technician. Please contact your provider's service department for installation assistance. Failure to properly secure the display to the mounting bracket may be hazardous.

## DVI Connector Pin Out

		DVI-D Digital	
PIN#	SIGNAL	PIN#	SIGNAL
1	T.M.D.S. DATA 2-	16	HOT PLUG DETECT
2	T.M.D.S. DATA 2+	17	T.M.D.S. DATA 0-
3	T.M.D.S. DATA 2/4 SHIELD	18	T.M.D.S. DATA 0+
4	T.M.D.S. DATA 4-	19	T.M.D.S. DATA 0/5 SHIELD
5	T.M.D.S. DATA 4+	20	T.M.D.S. DATA 5-
6	DDC CLOCK	21	T.M.D.S. DATA 5+
7	DDC DATA	22	T.M.D.S. CLOCK SHIELD
8		23	T.M.D.S. CLOCK+
9	T.M.D.S. DATA 1-	24	T.M.D.S. CLOCK-
10	T.M.D.S. DATA 1+		
11	T.M.D.S. DATA 1/3 SHIELD		
12	T.M.D.S. DATA 3-		
13	T.M.D.S. DATA 3+		
14	+5V POWER		
15	GND		

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## Cable Bend Radius

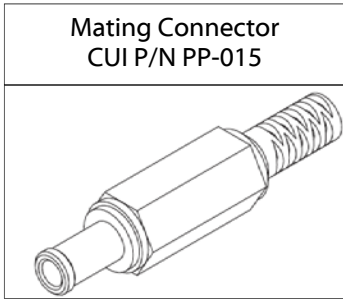
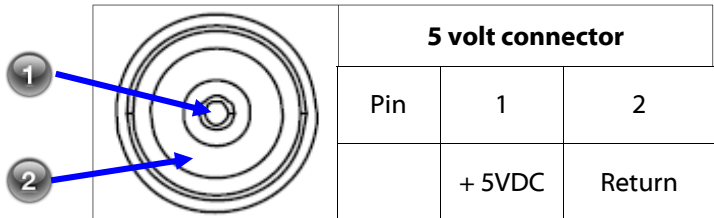


We recommend that the bend radius of metallic cables be no less than 2.5 inches (63 mm) or 7 times the diameter of the cable whichever is greater. Sharper bends may damage the cable and / or degrade the video signal.

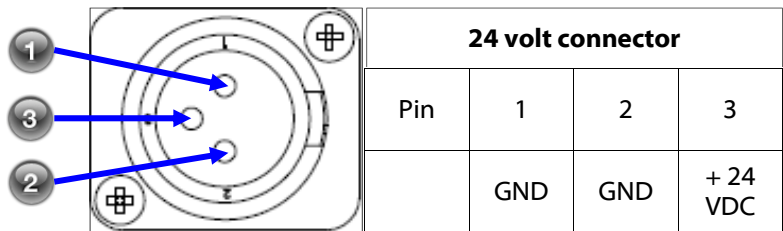
## RJ-45 Connector and Pin Out

Pin No.	Name	Notes/Description
1	TX_D1+	Transmit data +
2	TX_D1-	Transmit data -
3	RX_D2+	Receive data +
4	BI_D3+	Bi-directional data + (or n/c)
5	BI_D3-	Bi-directional data - (or n/c)
6	RX_D2-	Receive data -
7	BI_D4+	Bi-directional data + (or n/c)
8	BI_D4-	Bi-directional data - (or n/c)

## 5 Volt Connector and Pin Out



## Power Connector and Pin Out





Viewable Diagonal (inches)	26.0
Maximum Luminance <sup>b</sup> (cd/m <sup>2</sup> , typical)	800
BT.709 Luminance	500 (Stabilized)
Native Resolution	1920 x 1080
Dot Pitch (mm)	.287
Vertical Viewing Angle	178°
Horizontal Viewing Angle	178°
Contrast Ratio (nominal)	1000:1
3G-SDI Input signal level	.8 to 2.0 V p-p
DC Power Consumption (nominal) <sup>c</sup>	70W
AC Power Consumption (nominal) <sup>c</sup>	79W
Display Weight	18.8 lbs (8.5 kg)
Environmental	
Operating Temperature	0 to 35°C
Operating Humidity (non condensing)	20 to 85%
Operating Altitude	6,600 ft (2,000 m)
Storage Temperature	-20 to 50°C
Transport Temperature	-20 to 50°C
Storage Humidity (non condensing)	5 to 85%
Transport Humidity (non-Condensing)	5 to 85%
Storage Altitude	33,000 ft (10,000 m)

**Notes:**

- a. Specifications are subject to change without notice. Contact factory for current specifications.
- b. Brightness shown is without an A/R filter installed.
- c. BridgePower **BPM150S24F06** (Input : AC 100 - 240V ,50 - 60Hz ,2.5A Max ; Output :24VDC / 6.25A)

DVI Supported Resolutions	
Signal Parameter	Supported Range
Active Resolution (Horizontal x Vertical)	640 x 480 min to 1920 x 1200 max
Refresh Rate (Vertical Frequency)	23.98 Hz up to 85 HZ
Pixel Clock (Pixel Frequency)	25 MHz up to 165 MHz

The DVI-D input can automatically detect any valid digital DVI signal within the resolution, vertical refresh, and pixel clock ranges specified in the table above. Signals outside of any of the specified ranges may not be supported.

SDI Supported Resolutions					
Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)	Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)
720	480i	29.97	1280	720p	50
720	483i	29.97	1280	720p	59.94
720	487i	29.97	1920	1080sF	24
720	576i	25	1920	1080p	24
720	587i	25	1920	1080p	25
1280	720p	24	1920	1080p	29.97
1280	720p	25	1920	1080i	25
1280	720p	30	1920	1080i	29.97

Video and Graphics Inputs	Connector Type
3G-SDI	BNC, 75 Ohm terminated
DVI	DVI -D

## Cleaning and Disinfecting Instructions



Prior to cleaning and surface disinfection, the unit should be turned **OFF** and disconnected from its power source.

### **Cleaning:**

Thoroughly wipe all exterior surfaces with a lint-free cloth that has been dampened with an acceptable cleaning agent. Acceptable cleaning materials are listed below. Remove residual detergent by wiping all exterior surfaces with a lint-free cloth dampened with distilled water.

### **Disinfecting:**

Disinfect the unit by wiping all exterior surfaces with a lint-free cloth dampened with 80% Ethyl Alcohol. Allow the unit to air dry.



### **Cautions:**

Do not allow liquids to enter the interior of the unit, and do not permit exterior surfaces to come into contact with unacceptable solvents such as those listed below, as severe damage to the unit may result.

### **Acceptable Cleaning Materials:**

Vinegar (distilled white vinegar, 5% acidity)  
Ammonia-based glass cleaner

### **Acceptable Disinfecting Material:**

Ethanol 80 % by volume

### **Unacceptable solvents:**

MEK (Methyl Ethyl Ketone)  
Toluene  
Acetone

### **Note:**

The acceptable cleaning and disinfecting materials listed above have been tested on NDS products and, when used as directed, do not harm the product's finish and or its plastic components.




## Electromagnetic Compatibility (EMC) Tables

All medical electronic devices must conform to the requirements of IEC 60601-1-2. Precautions, adherences to the EMC guideline information provided in this manual and verification of all medical devices in simultaneous operation are required to ensure the electromagnetic compatibility and co-existence of all other medical devices prior to a surgical procedure.

The EMC tables on next 3 pages are provided for your reference.

Guidance and manufacturer's declaration – electromagnetic emissions		
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.		
Emissions	Compliance	Electromagnetic environment-- guidance
RF emissions CISPR 11	Group 1	The product 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.  The product is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Not Applicable	
Voltage fluctuations/ flicker emissions IEC 61000 -3-3	Not Applicable	

Guidance and manufacturer's declaration 211; electromagnetic immunity			
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV 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	±2 kV for power supply lines	±2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) and neutral	±1 kV line(s) and neutral	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % $U_T$ (>95 % dip in $U_T$ ) for 0,5 cycle 40 % $U_T$ (60 % dip in $U_T$ ) for 5 cycles 70 % $U_T$ (30 % dip in $U_T$ ) for 25 cycles <5 % $U_T$ (>95 % dip in $U_T$ ) for 5s	<5 % $U_T$ (>95 % dip in $U_T$ ) for 0,5 cycle 40 % $U_T$ (60 % dip in $U_T$ ) for 5 cycles 70 % $U_T$ (30 % dip in $U_T$ ) for 25 cycles) <5 % $U_T$ (>95 % dip in $U_T$ ) for 5s	Mains power quality should be that of a typical commercial or hospital environment. If a dips or an interruption of mains power occurs, the current of the product may be dropped off from normal level, it may be necessary to use uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Not applicable	Not applicable
NOTE $U_T$ is the a.c. mains voltage prior to application of the test level			

Guidance and manufacturer's declaration – electromagnetic immunity			
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 Vrms</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the product, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> $d = 1,2\sqrt{P}$ $d = 1,2\sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = 2,3\sqrt{P} \quad 800 \text{ MHz to } 2,5 \text{ GHz}$ <p>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 metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,<sup>a</sup> should be less than the compliance level in each frequency range.<sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>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 product is used exceeds the applicable RF compliance level above, the product should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the product.</p> <p>b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

Recommended separation distances between  
portable and mobile RF communications equipment and the product

The product is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the product can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the product as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power (W) of transmitter	Separation distance, in meters according to frequency of transmitter		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

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 guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.













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