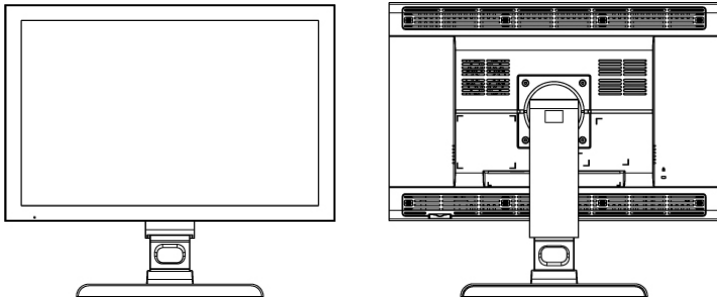


# MDRC-2124



**User manual**

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# Preface

## Important notice

### Notice

Although every attempt has been made to achieve technical accuracy in this document, we assume no responsibility for errors that may be found. Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

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The specifications of Barco products are subject to change without notice.

### Trademarks

All trademarks and registered trademarks are property of their respective owners.

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## Environmental information

### Disposal Information

The lamps inside the display contain mercury. Do not throw the display in the trash. Dispose of it as required by local ordinances or regulations.

This equipment has required the extraction and use of natural resources for its production. It may contain hazardous substances for health and environment.

In order to avoid the dissemination of those substances in the environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems.

Those systems will reuse or recycle most of the materials of your end-of-life equipment in a sound way.



The crossed-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administrator.

You can also contact us for more information on the environmental performances of our products.

---

# Safety Instructions

## General Recommendations

- Read the safety and operating instructions before operating the display.
- Retain safety and operating instructions for future reference.
- Adhere to all warnings on the display and in the operating instructions manual.
- Follow all instructions for operation and use.

## Electrical shock



**Warning-**

To prevent the risk of fire or shock hazards, do not expose this product to rain or moisture



**Warning-**

Please do not open or disassemble the product as this may cause electric shock.

## Classification:

Electrical Shock Protection: Class I.

Disconnect Device: Connect / Remove power cord plug directly.

Degree of Protection Against Electric Shock: No applied part.

Degree of Protection Against Harmful Ingress of Water: Ordinary equipment (IPX0).

Degree of Safety in the Presence of Flammable Anesthetic Mixture with Air or with Oxygen or Nitrous Oxide: Not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Mode of Operation: Continuous.

---

## **Intended use**

This display is an AMLCD display designed for viewing medical X-ray images. This unit should not be used near patients and should be kept outside of 1.83 m perimeter and 2.29 m vertical.

## **Power connection**

Power requirements: The display must be powered using a medical approved 24VDC power supply.

For use only with power supply SINPRO:HPU100-108

Input: 100-240V~, 47-63Hz, 1.2-0.5A

The medical approved DC power supply must be powered by the AC mains voltage.

## **Power cords**

Utilize a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.

Do not overload wall outlets and extension cords as this may result in fire or electric shock.

Mains lead protection (U.S.: Power cord): Power cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

## **External equipment**

External equipment intended for connection to signal input/output or other connectors, shall comply with relevant UL/ EN/ IEC standard (e.g. UL/EN/IEC 60950 for IT equipment and UL/EN 60601-1 / IEC 60601 series for medical electrical equipment). In addition, all such



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combinations – systems – shall comply with the standard IEC 60601-1-1, Safety requirements for medical electrical systems. Equipment not complying with UL/EN / IEC 60601-1 shall be kept outside the patient environment, as defined in the standard.

Equipment not complying with IEC 60601 must be kept outside the patient environment, as defined in the standard as at least 1.5 meters from the patient or the patient support.

Any person who connects external equipment to signal input, signal output, or other connectors has formed a system and is therefore responsible for the system to comply with the requirements of IEC 60601-1-1. If in doubt, speak with a qualified technician.

In locations where 240V outlets are used, connect this display only on a center-tapped, 240V, single-phase supply.

### **Water and moisture**

Never expose the display to rain or moisture.

Never use the display near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.

### **Ventilation**

Do not cover or block the ventilation openings in the cover of the set. When installing the display in a cupboard or another closed location, heed the necessary space between the set and the sides of the cupboard.

### **Installation**

Place the display on a flat, solid and stable surface that can support the weight of at least 3 displays. If you use an unstable cart or stand, the display may fall, causing serious injury to a child or adult, and serious damage to the equipment.

---

# Recommendations for using your display system

## 1. Optimize the lifetime of your display

Enabling the Display Power Management System (DPMS) of your display (in the display's Settings menu) will optimize its diagnostic lifetime by automatically switching off the backlight when the display is not used for a specified period of time. By default, DPMS is enabled on your display, but it also needs to be activated on your workstation. To do this, go to "Power Options Properties" in the "Control Panel".

Barco recommends setting DPMS activation after 20 minutes of non-usage.

## 2. Use a screen saver to avoid image retention

Prolonged operation of an LCD with the same content on the same screen area may result in a form of image retention.

You can avoid or significantly reduce the occurrence of this phenomenon by using a screen saver. You can activate a screen saver in the "Display properties" window of your workstation.

Barco recommends setting screen saver activation after 5 minutes of non-usage. A good screen saver displays moving content.

In case you are working with the same image or an application with static image elements for several hours continuously (so that the screen saver is not activated), change the image content regularly to avoid image retention of the static elements.

## 3. Understand pixel technology

LCD displays use technology based on pixels. As a normal tolerance in the manufacturing of the LCD, a limited number of these pixels may remain either dark or permanently lit, without affecting the diagnostic

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performance of the product. To ensure optimal product quality, Barco applies strict selection criteria for its LCD panels.

To learn more about LCD technology and missing pixels, consult the dedicated white paper available at [www.barcomedical.com](http://www.barcomedical.com).

#### **4. Enhance user comfort**

Every Barco multi-head display system is color matched with the highest specification in the market.

Barco recommends keeping color-matched displays together. Furthermore, it is important to use all displays of a multi-head configuration at the same rate to preserve color matching throughout the economic lifetime of the system.

#### **5. Maximize Quality Assurance**

The 'MediCal QAWeb' system offers online service for high-grade Quality Assurance, providing maximum diagnostic confidence and uptime.

Learn more and sign up for the free MediCal QAWeb Essential level at [www.barcomedical.com/qa](http://www.barcomedical.com/qa)

## **Unpacking and handling tips**

The MDRC display is a precision instrument that requires proper care to maintain product operation and adherence to specification. Unpack the display and components carefully, then set up and handle the unit properly to avoid damage to the LCD panel.

- Use both hands to grasp the display case when lifting it from the shipping carton, but avoid touching the screen.
- Do not apply pressure to the screen or touch the screen with bare fingers or objects. Pressure can affect image quality.

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Cosmetics and oils on the skin are both detrimental to the screen and difficult to remove.

- Allow the display to warm up to room temperature before turning it on. Avoid sudden temperature changes in the environment, as this may cause condensation, which damages the display.
- Do not set up the display near strong light or heat sources.
- Do not block the vents on the back of the display or install the display in a built-in enclosure. Blocked vents cause excessive heat to build up inside the display, increasing risk of fire.
- When installing components, turn off your computer, but leave it plugged into a grounded outlet.
- Do not remove the back cover or disassemble the display. There are no user-serviceable parts inside.

## Preventing fire and injury

- Replace the power supply or cables if damaged.
- Use only the power source indicated in this guide or listed on the display.
- Do not plug the power supply into an overloaded AC outlet or extension cord. Overloaded AC outlets and cords can result in electric shock or fire.
- Do not drop or push objects into the display case. Internal components contain high voltage.
- Unplug the power cord from the wall outlet during thunderstorms.
- Do not place magnetic devices, such as motors, near the display.

---

## Cleaning the display

Observe the following guidelines to maintain display and LCD screen.

- Use a clean, lint-free, absorbent cotton cloth to clear off any residual glue from removal of the protective film or to remove surface dust. Apply light pressure to remove the dust.
- Dampen a clean cloth with a small amount of isopropyl alcohol to remove glue or dust if the screen is still not clean. Do not saturate the cloth; otherwise, alcohol may seep into the display case and collect in the enclosure. Use a clean, dry cloth to completely remove the alcohol residue.
- It is advised to clean the display on weekly basis.
- Do not use chemically treated dust cloths, acetone, toluene, or harsh solvents on the display case or the screen. They can damage the polarizer and the display case.
- Do not expose the display to water or excessive moisture. Do not allow water or other stains to stand on the unit. Wipe liquids off immediately to prevent damage to the display case and the screen.

## Shipping/storing the display

Keep the display in its shipping container until installation. Return the display to its original container whenever you need to store the unit, move it to another location, or return it for repair. The packaging supplied by the manufacturer protects the display while it is in transit. See environment specifications for more information.

Before returning the display to the container, do the following:

1. Swivel the display panel in portrait mode.
2. Push the panel down to the lowest position.
3. Use the stand lock to anchor the panel.

---

## Explanation of symbols



**DISPOSAL.** Do not use household or municipal waste collection services for disposal of electrical and electronic equipment. EU countries require the use of separate recycling collection services.



**CAUTION.** Read the accompanying text carefully for proper operation and maintenance of the display system.



**DIRECT CURRENT**



**ALTERNATING CURRENT**



**RELATIVE HUMIDITY**

Storage & transport: 5%~ 90% (No condensation)  
Operating: 8% ~ 80%



**TEMPERATURE**

Storage & transport: -20° to 60°  
Operating: 0°~35°C

---

# Introduction

## About the product

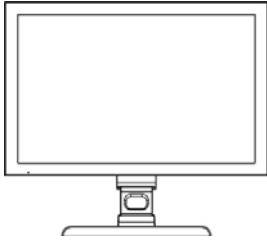
Thank you for choosing Barco.

The MDRC-2124 is an LCD display with an active matrix, thin-film transistor (TFT) liquid crystal display (LCD). This product also demonstrates the following outstanding features:

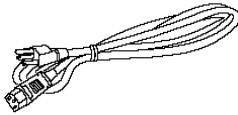
- DVI-I and DisplayPort signal
- 24" diagonal Screen
- 1920x1200 high resolution
- Wide Viewing Angle Technology
- 31.5 ~ 80 kHz horizontal scan
- 59 ~ 61 Hz refresh rate
- Auto Adjustment and Re-scaling function
- High quality full screen re-scaling capability
- Multilingual OSD user controls
- VESA DPMS power saving
- Kensington lock capability

---

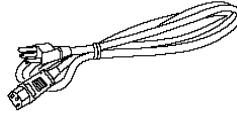
## Package overview



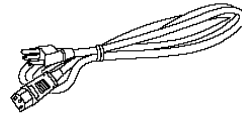
User manual



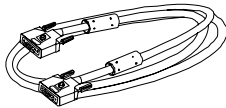
USA Power Cord



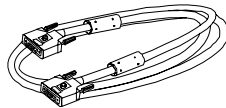
EUR Power Cord



China Power Cord



DisplayPort Signal  
Cable



DVI-D Signal Cable



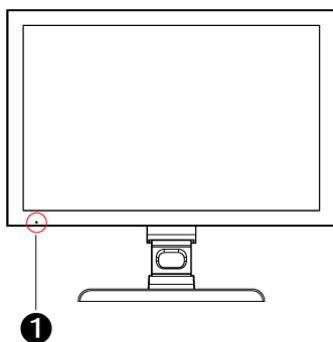
Power Adapter  
Cable



---

## Display parts, controls and connections

### Front View

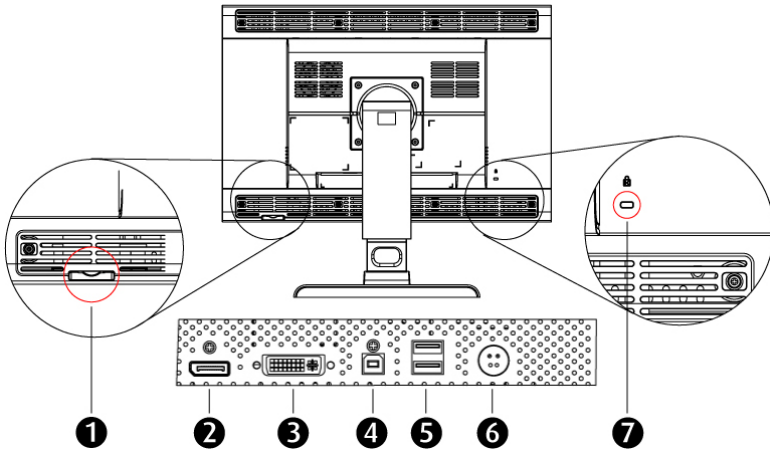


#### ❶ Power LED

1. Green indicates the display is turned on.
2. Orange indicates the display is in stand-by mode.

---

## Back View



### 1 Control wheel

1. Press the control wheel for 1 sec to power off to the LCD Display.
2. Swivel the control wheel for OSD menu.

---

### 2 DisplayPort input

---

### 3 DVI-I input

---

### 4 USB upstream

---

### 5 USB downstream

---

### 6 DC Power input

---

### 7 Kensington Security Slot

The display can be secured to your desk or any other fixed object with Kensington lock security products. Kensington lock itself is not included.

---

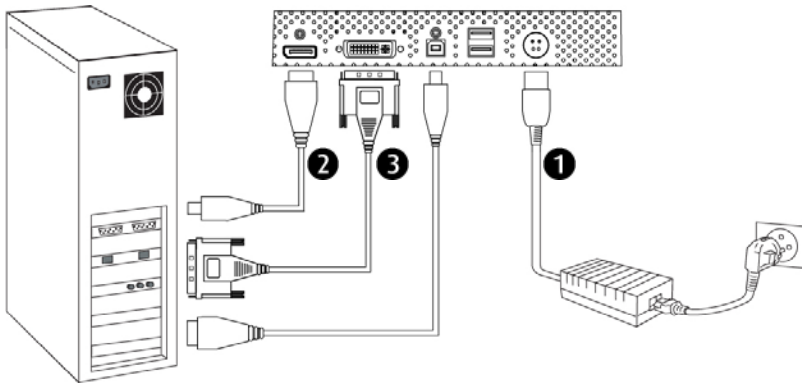
# Installation

## Connecting the display

Use only the power adapter, power cord, and the video cables shipped with this display.

To setup this display, please refer to the following figure and procedures.

1. Be sure all equipment is turned off.
2. Connect the DC power cord to the power connector; plug one end of the AC power cord into the power adapter, and the other end into an electrical outlet. (❶).
3. For a PC with DisplayPort output, connect the DisplayPort signal cable from the display DisplayPort input connector to the DisplayPort connector of your host computer. (❷).
4. For a PC with DVI digital output, connect the DVI signal cable from the display DVI-I input connector to the DVI connector of your host computer. Tighten the screws (❸).
5. Turn on your computer, display and video source.

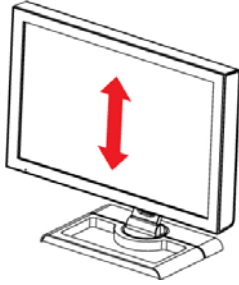


**Note:** To ensure the LCD Display will work well with your computer, please configure the display mode of your graphics card to make it less than or equal to the native resolution, and make sure the timing of the display mode is compatible with the LCD screen. We have listed the “Compatibility Modes” of this LCD screen in appendices for your reference.

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## Adjusting the display position

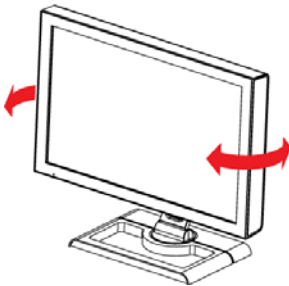
Vertical height



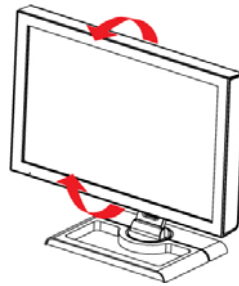
Portrait/Landscape



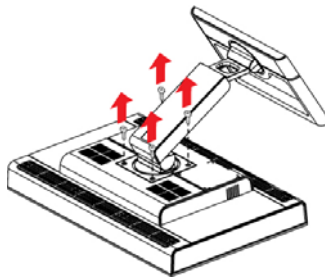
Left to right pan



Front to back tilt



Remove display from stand

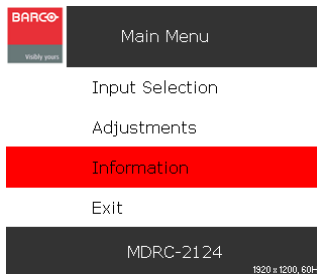


---

# On-Screen Display menus

## How to use the OSD menu

1. When the display is on and the OSD is not on the screen, press the control wheel.  
The front illumination is switched on for about 10 seconds.
2. **To display the main menu**, swivel the control wheel while the illumination is on.  
The OSD main menu appears. Several menu items submenus.



**Note:** Some of the menu items described in this manual may not be available on your display, depending on the selected video input.

3. **To scroll through the menu**, swivel the control wheel.  
The corresponding submenus are displayed automatically. The red scroll bar indicates the active menu item.
4. **To jump into a submenu** while it is displayed, press the control wheel.  
The red scroll bar now appears in the submenu.
5. **To exit from a submenu**, swivel the control wheel to select Exit.  
Next, press the control wheel.  
If you exit from the OSD main menu, you exit the OSD.

- 
6. **To change an adjustment value or setting**, swivel the control wheel to select the adjustment or setting. Next, press the control wheel to go into edit mode. This is indicated by the trackbar turning dashed. Swivel the control wheel to change the value. Press the control wheel to confirm the change. For multiple choice options, the currently selected option is indicated by a “V”.

## OSD menus overview

### Input selection menu

Name	Description
Auto	Select this setting if you wish the display to select the video input automatically.
DisplayPort	Select this setting if you wish the display to select the digital video input on the DisplayPort connector.
DVI Digital	Select this setting if you wish the display to select the digital video input on the DVI connector.
DVI Analog	Select this setting if you wish the display to select the analog video input on the DVI connector.

---

## Adjustments menu

Name	Description
Luminance	Allows to manually adjust the luminance target if you'd experience the overall image is too dark or too bright. When you change this setting, the display will adjust its backlight to reach its target.
Gamma	Jumps to the gamma submenu (see below).
White point	Jumps to the white point submenu (see below).
Analog	Jumps to the analog submenu (see below). This submenu is only available when the DVI analog input is selected.
Settings	Jumps to the settings submenu (see below).

## Gamma submenu

Name	Description
Native	If you select this gamma option, the native panel gamma behavior will not be corrected.
DICOM	Select a DICOM gamma for most medical viewing applications. The DICOM gamma results in more visible grayscales in the images.



---

Name	Description
Gamma 1.8 Gamma 2.2	Select one of these gamma options in case the display replaces a CRT display with a gamma of 1.8 or 2.2 respectively.
sRGB	Select this gamma option for viewing images intended for the internet.
QAWeb	Select this option if you wish to use the gamma settings defined in QAWeb Agent.

### White point submenu

Name	Description
Native	If you select this white point option, the native panel white point behavior will not be corrected.
Clearbase	A color temperature according to the clearbase film standard.
Bluebase	A color temperature according to the bluebase film standard.
D65	A color temperature of 6500 Kelvin.
QAWeb	Select this setting if you wish to use the white point settings defined in QAWeb Agent.
User	Jumps to the user submenu (see below).

---

## User submenu

Name	Description
Red	Allows to manually adjust the image red level target.
Green	Allows to manually adjust the image green level target.
Blue	Allows to manually adjust the image blue level target.

## Analog submenu

Name	Description
Auto Adjust	Select this setting if you wish the display to automatically adjust the geometric and level settings of the DVI analog image.
Geometry	Jumps to the geometry submenu (see below).
Level	Jumps to the level submenu (see below).

## Geometry submenu

Name	Description
Clock Frequency	Allows to manually adjust the sampling frequency of the DVI analog image.
Clock Phase	Allows to manually adjust the sampling phase of the DVI analog image.

---

Name	Description
Horizontal Position	Allows to manually adjust the horizontal position of the DVI analog image.
Vertical Position	Allows to manually adjust the vertical position of the DVI analog image.

### Level submenu

Name	Description
Contrast	Allows to manually adjust the image contrast target of the DVI analog image.
Brightness	Allows to manually adjust the image brightness target of the DVI analog image.

### Setting submenu

Name	Description
Language	Allows to select another language for the OSD menus.
DPMS	Allows to switch the display power management system on/off. The DPMS system will power down the display when the connected computer is left idle for a certain time. Barco recommends to switch DPMS on and to use a good Windows screensaver to prevent image burn-in (image retention) on the LCD panel.

---

Name	Description
LED	Allows to switch the power LED's on state on/off. The LED's orange DPMS state is not influenced by this setting. So, when the display goes into power saving mode, the LED will turn orange, even if it was switched off by this setting.
OSD Settings	Jumps to the OSD setting submenu (see below).
Factory Reset	Allows to reset the default factory settings in all OSD menus. As a consequence all user settings, including the user presets and user profiles, will be erased and the display will restart.

### OSD setting submenu

Name	Description
OSD Timeout	Allows to adjust the OSD timeout as desired. When selected, the OSD will automatically disappear when the display controls are left idle for the time selected.
Horizontal OSD Position	Allows to adjust the horizontal OSD position.
Vertical OSD Position	Allows to adjust the vertical OSD position.
OSD Direction	Allows to switch the OSD orientation from landscape to portrait and vice versa.

---

## Information menu

Name	Description
Display Name	Indicates the display type.
FW Version	Indicates the current internal firmware version.
Serial Nr	Indicates the display serial number.
Backlight Runtime	Indicates the total time the display has been operating, excluding the time in stand-by.
System Hours	Indicates the total time the display has been operating, including the time in stand-by.

---

# Appendix

## Troubleshooting

If you are experiencing trouble with the LCD display, refer to the following troubleshooting. If the problem persists, please contact your local dealer or our service center.

### **Problem: No image appears on screen.**

- Check that all the I/O and power connectors are correctly and well connected as described in the “Installation” section.
- Make sure the pins of the connectors are not crooked or broken.

### **Problem: Partial image or incorrectly displayed image.**

- Check to see if the resolution of your computer is higher than that of the LCD Display.
- Reconfigure the resolution of your computer to make it less than or equal to the native resolution (1920 x 1200).

### **Problem: Image has vertical flickering line bars.**

- Use “Clock” to make an adjustment.
- Check and reconfigure the display mode of the vertical refresh rate of your graphics card to make it compatible with the LCD Display.

### **Problem: Image is unstable and flickering**

- Use “Phase” to make an adjustment.

---

**Problem: Image is scrolling**

- Check and make sure the video signal cable (or adapter) is well connected.
- Check and reconfigure the display mode of the vertical refresh rate of your graphics card to make it compatible with the LCD Display.

**Problem: Vague image (characters and graphics)**

- Use “Clock” to make an adjustment. If this problem still exists, use “Phase” to make an adjustment.

## Warning Signal

Sometimes you may see warning messages for this LCD Display. This means that the LCD Display cannot correctly receive the signal from the computer graphics card.

**No Signal**

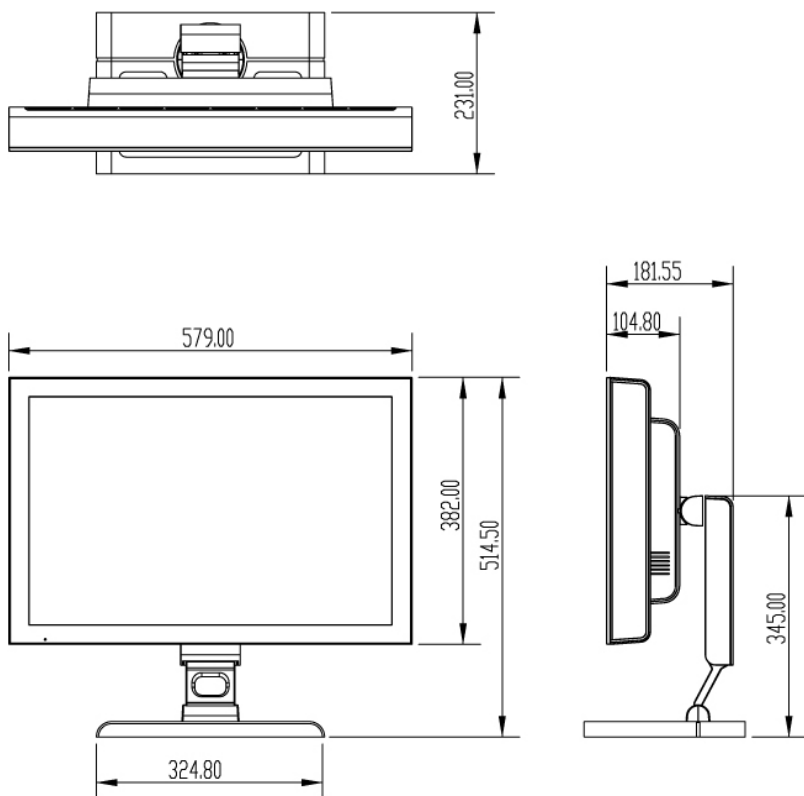
This message means that the LCD Display has been powered on but it cannot receive any signal from the computer graphics card. Check all the power switches, power cables, and signal cables.

**Out Of Range**

This message means that the signal of the computer graphics card is not compatible with the LCD Display. When the signal is not included in the compatibility mode we have listed in the Appendices of this manual, the LCD display will show this message.

---

## Product dimensions





# Technical specifications

<b>LCD Panel</b>	
Technology	TFT Color LCD (E-IPS)
Native resolution	1920x1200
Active screen diagonal	24.1" (611 mm)
Active screen area	518 x 324 mm
Pixel Pitch	0.270 x 0.270 mm
<b>Visual Characteristic</b>	
Maximum luminance	400 cd/m <sup>2</sup>
DICOM calibrated luminance	250 cd/m <sup>2</sup>
Image stabilization	BLOS (Backlight sensor)
Contrast ratio	1000:1 (typical)
Aspect ratio	16:10
Viewing angle (CR>10)	R/L 178 (typical), U/D 178 (typical)
Display LUT	10 bit
Response time (G-G)	5 ms
Display Functions	Gamma, Dicom
Colors	16.8 million
<b>Connectivity and control</b>	
Video Input	DVI-I
	DisplayPort
	USB 2.0 (1 upstream, 2 downstream)

OSD languages	English, French, German, Spanish, Italian, Dutch, Simplified Chinese, Traditional Chinese, Korean.
<b>Options</b>	
Protective Cover	Yes
Touch Screen	Yes
Landscape/Portrait	Yes
<b>Approvals</b>	
EMC	EN 60601-1-2; FCC-B; ICES-001, VCCI, KCC, CCC, BSMI
Safety	CE EN60601-1; UL 60601-1, c-UL, CCC, KCC, BSMI
<b>Mechanical characteristics</b>	
Display dimensions (W x H x D) Landscape, w/o pedestal	579 x 382 x 106 mm
Display weight	With Stand : 15.4 kg (W/ Touch)
	Without Stand : 10 kg
Display stand	Tilt, height & swivel
<b>Power requirements</b>	
External DC Power Supply	90V-264V (50Hz-60Hz)
Standby Power	< 1 W
Power consumption	100 Watts
<b>Environmental</b>	
Operating T (min-max)	0° to 35°C
Humidity	5% - 90% (no condensation)

---

## Compatibility modes

Standard	Resolution	Vertical Refresh (Hz)	Horizontal Scan (kHz)
IBM VGA	640x480	60	31.5
VESA VGA	800x600	60	37.9
VESA XGA	1024x768	60	48.4
VESA XGA	1152x870	60	54.36
VESA SXGA	1280x1024	60	63.96
UXGA	1600x1200	60	75
	1920x1080	60	70.2
	1920x1200	60	74.1

---

# Regulatory Compliance

## Canada, European Union, United States



MEDICAL EQUIPMENT  
WITH RESPECT TO ELECTRIC SHOCK,  
FIRE AND MECHANICAL HAZARDS ONLY  
IN ACCORDANCE WITH UL 60601-1 AND  
CAN/CSA C22.2 NO. 601.1

This display has been tested and found to comply with IEC/UL/EN 60601-1 and IEC 60601-1-2 standards, and is certified to meet medical

standard UL 60601-1 and CAN/CSA C22.2 No 601.1(C US Mark) which are related to electrical shock, fire and mechanical hazards only as shown on right UL mark on this page.

The medical display, in addition to meeting medical requirements, has been tested and found to comply with the limits for Federal Communications Commission (FCC) Class B computing devices in a typically configured system since many medical offices are located in residential areas. It is the system integrator's responsibility to test and ensure that the entire system complies with applicable electromagnetic compatibility (EMC) laws.

Barco NV has made great efforts to support the medical device industry, in particular, medical device manufacturers and medical device system integrators. We offer state-of-the-art color displays that are compliant with worldwide accepted medical device safety standards, and for the European market, CE-marked displays based on compliance with council directive 93/42/EEC—commonly referred to as the Medical Device Directive (MDD). The following summarizes our qualification of these displays as it relates to compliance with the MDD.

The European Medical Device Directive requires that the intended use of the device be defined. The intended use of these displays is "to display alphanumeric, graphic, and image data as inputted from any type of medical device." These displays do not provide a measurement function in any way, and it is the device and systems manufacturer's responsibility to verify its function in the integrated device or system.

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The display was classified as required by the MDD according to Annex IX of the directive and the medical device (MEDDEV) guidance available at the time of classification. Because the display uses electrical energy and has no direct patient connections and—by itself—no medical utility, the display is classified according to Rule 12 as an MDD Class I device, component, or accessory. The MDD states that manufacturers of Class I medical devices or accessories shall satisfy the requirements in regard to design and manufacturing controls, that is, the applicable assessment route to be used for CE-marking under the MDD, and it shall carry the CE mark according to Annex XII of the directive, with no notified body annotation.

In the opinion of Barco NV registration required to put this device into commerce is the responsibility of the medical device/system manufacturer, and Barco supports this requirement by providing a European Commission (EC) declaration of conformity. If Barco supplies a display to an end user, rather than a device manufacturer, it is the end user's responsibility to ensure continued compliance with the MDD of the system in which the display is integrated.

The supplier will make available on request, circuit diagrams, component part lists, etc.

For vigilance reporting as required under Article 10 of the MDD, Barco NV will provide any information requested by competent authority to support any reported incident investigation by such an authority.

### **EU Declaration of Conformity for Medical Application**

A Declaration of Conformity has been filed for this product. For additional copies of the Declaration of Conformity document, contact Barco NV

The MDRC series digital flat-panel display meets the essential health and safety requirements, is in conformity with, and the CE marking has been applied according to the relevant EU Directives listed below, using the relevant section of the following EU standards and other normative documents;


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EU EMC Directive 89/336/EEC

EU Electromagnetic Compatibility Directive

EN 60601-1-2 (2001)	Collateral standard electromagnetic
Medical Electrical Equipment	compatibility requirements
EN 55011 (Class B)	Limits and methods of measurements for radio interference characteristics of industrial, scientific, and medical equipment
IEC 61000-3-2	Harmonic emissions
IEC 61000-3-3	Voltage fluctuations/flicker emissions
IEC 61000-4-2	Electrostatic discharge requirements for industrial process measurement and control equipment
IEC 61000-4-3	Radiated electromagnetic field requirements for industrial process measurement and control equipment
IEC 61000-4-4	Electrically fast transients for industrial process measurement and control equipment
IEC 61000-4-5	Surge requirements
IEC 61000-4-11	Voltage variations/dips/interrupts

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IEC 61000-4-6	Conducted immunity
IEC 61000-4-8	Magnetic field immunity
	Conformance to the Medical Device Directive 93/42/EEC
EN 60601-1 Medical Part 1	General requirements for safety Electrical Equipment.

### U.S. FCC Compliance Statement

This device complies with Part 15 of the FCC Rules.

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 undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications.

However, 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.

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- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technical for help.

CAUTION: Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### Other countries

Japan VCCI level B

Korea KCC level B

PRC CCC level B

Taiwan BSMI level B



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# BARCO MID GENERAL WARRANTY TERMS AND CONDITIONS

Applicable from Jan 1st 2008

## ARTICLE 1: PRODUCT WARRANTY

Barco nv, Medical Imaging Division warrants that the equipment will be free of defects in workmanship or material for the warranty period or the specific period of a warranty extension program.

Hardware: Barco warrants that upon delivery hereunder the Products shall (i) conform to its specifications in effect at the date of delivery and (ii) be free from defects in material and workmanship (the "Warranties").

Software: Barco warrants that software written by Barco shall perform substantially in accordance with the specifications in effect at the date of delivery. Software is inherently susceptible to bugs and errors. Barco makes no warranties with respect to the software which is provided to Customer on an "as-is" basis and does not warrant uninterrupted or error-free operation of the Products.

Unless otherwise indicated in Barco's web site or in the agreement between Barco and Customer, the Warranty Period shall be

- (a) Hardware: 12 months commencing on the Barco date of invoice.
- (b) Software: 3 months commencing on the Barco date of invoice.

Notwithstanding the provisions of clause 2, repair and replacement of defects in material and/or workmanship under this warranty shall be accomplished in our works according to the terms and conditions as set forth hereafter:

### 1.1

Any claim under the Warranties must be notified to Barco in writing within 8 days from the date the defect or failure has been discovered or noticed the first time. The Customer, upon the occurrence of any equipment failure, shall contact Barco nv, MID customer support centre (or an authorised service centre) by telephone, fax or e-mail and shall provide the applicable customer support person with a complete description of the problem being encountered, including the model and serial number of the equipment in which the problem has arisen.

### 1.2

The customer support person shall diagnose the problem experienced by the Customer and shall advise the Customer on how to proceed. Customer support may ask to return the faulty equipment or faulty subassemblies to the Barco nv, or a MID customer support centre (or an authorised service centre) for repair activities. In no event shall Customer return a defective Product or part thereof to Barco without Barco's prior written approval.

In the event the return to Barco of the defective Product is authorized by Barco, Barco shall issue to Customer an RMA (Return Material Authorization).

The Customer shall apply for an RMA number to the closest Barco nv, MID Customer support centre (or an authorised service centre) as listed at [www.barcomedical.com](http://www.barcomedical.com), unless otherwise indicated.

The one-way cost of packing, transport and insurance related to shipping the alleged defective Product or part to Barco for repair or replacement shall be borne by Customer. The one-way cost of packing, transport and insurance related to shipping of the repaired or replacement Product or part to Customer shall be borne by Barco.

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1.3

The Customer shall return, freight prepaid, the defective equipment or subassemblies in its original packaging with the assigned RMA number for repair to the Barco nv, MID Customer support centre (or an authorised service centre).

1.4

Replacement parts used shall be new or equivalent to new parts for the revision level of the equipment. A replacement LCD panel will be new or similar run time. The warranty period for the replacement parts will expire at the same moment as the original warranty period of the equipment. All parts replaced hereunder and returned to Barco nv, MID (or an authorised service centre) shall become the property of Barco nv, MID (or the authorised service centre).

1.5

The repaired equipment shall be returned to the Customer, by regular freight, at Barco nv, MID's charge.

1.6

Barco nv, MID will replace a product that fails within 90 days after shipment from Barco with a new one, ensuring color matching in the event of a diagnostic multi head display configuration.

Barco aims to ship the new replacement product within 2 business days after receipt of the Customers notification in writing.

## **ARTICLE 2: CONDITIONS PRECEDENT FOR WARRANTY AND ITEMS EXCLUDED FROM WARRANTY**

A. The Warranties shall apply only to the extent the Products or any parts thereof have

(i) been transported and stored at all times in the original packaging in the conditions as specified by Barco (such as covered and secure location, minimum and maximum temperature, maximum humidity, ...) or, in absence thereof, at least in conditions consistent with generally accepted practice for this type of products;

(ii) been handled at all times in accordance with Barco's instructions or, in absence thereof, at least with the care and caution consistent with generally accepted practice for this type of products;

(iii) been installed strictly in accordance with the instructions and directions given by Barco (if and to the extent the Products have not been installed by Barco or its authorized subcontractors);

(iv) not been subject to any unauthorized access, alteration, modification or repair or attempts thereto;

(v) been at all times "normally used" for the intended purpose and operated in strict accordance with the operating instructions set forth in the operating manual of the Product in question and shall not have been otherwise misused, abused, damaged. For the purpose hereof, "normally used" shall mean a regular, ordinary and routine usage of the Product in question as intended and/or recommended by Barco;

(vi) been maintained at all times in accordance with Barco's instructions or, in absence thereof, at least with intervals and in a manner consistent with generally accepted practice for this type of products;

B. The warranty described herein shall not include the following:

2.1

Any hardware or software item procured from a source other than Barco nv, MID or their official agent or distributor and integrated by Customer or a third party into Barco nv, MID supplied equipment.

2.2

Any host configuration not explicitly supported by Barco nv, MID.

2.3

All software installed on the system, whether they are acquired from Barco nv, MID or third party. An exception is made for software delivered by Barco nv, MID that would prove to be a cause for the

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mal functioning of the hardware covered under this Agreement.

#### 2.4

Normal wear and tear, use under circumstances exceeding specifications, such as use in dusty environment or under excessive temperature conditions, abuse, unauthorised repair or alternation, lack of proper configuration or maintenance, damaged or modified or removed serial number, cosmetic refurbishment.

#### 2.5

Repair or replacement of consumables<sup>1</sup> or specific parts that by definition are subject to wear and tear, including but not limited to:

- a. CRT's, LCD panels
- b. Backlights in diagnostic LCD displays, when the backlight run time<sup>2</sup> is beyond the Guaranteed Backlight Lifetime<sup>3</sup> of that model, when used at the Factory Calibrated Luminance<sup>4</sup>

Eg1.

- A display is used at 8 hours/day; ie. +/-2.920hours/year
- The display system is covered with a warranty period of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 4 year, thus corresponding to +/-11.680hours
- Result: the backlight replacement is performed under warranty

Eg2.

- A display is used at 24 hours/day; ie. 8.760hours/year
- The display system is covered with a warranty program of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 2.5years, thus corresponding to +/-21.900hours
- Result: the backlight replacement does not make part of the warranty coverage.

(1): 'Consumable' is a part that can be replaced by the user

(2): 'Backlight run time' is the total time that an image (including use of a screen saver) has been applied to the screen; this value can be consulted via the OSD buttons (On Screen Display).

(3): 'Guaranteed Backlight Lifetime' is the number of backlight hours during which a predefined luminance value, ie. the Factory Calibrated Luminance, will be provided by a specific diagnostic display model. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

(4): 'Factory Calibrated Luminance': is the typical luminance value that a specific diagnostic display model is calibrated at during the production process. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

c. Lamps, optical components in projectors

d. Replacement because of:

i. image retention as a result of:

- not correctly using screen saver and/or Display Power Management System (DPMS) as explained in the user manual
- prolonged operation of the display with a static image on the same screen area

ii. a number of missing pixels that is lower than the total allowable number as mentioned in the product specifications.

iii. difference in color temperature that is lower than the total allowable difference as mentioned in the product specifications

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- iv. difference in color temperature as a result of not using all displays of a multi-head configuration at the same rate.
  - v. LCD luminance uniformity that is in within the product specifications or luminance uniformity performance that is inherent to LCD technology.

Barco nv, MID does not warrant a minimum life time nor a performance of any of the consumables.

2.6

Replacement of moveable parts such as power cords, remote controls, ...

2.7

Any product disassembly and installation costs at the operation site, travel expenses and travel time to and from the operation site for the personnel in charge of the repair works and transport charges.

2.8

Any failures resulting from an accident, negligence (such as but not limited to removing or deleting system files & licensed software product files), misuse, circuit failure or any change, damage due to fire, water, thunder or lightning, power failure or fluctuation, disruption of communication lines or due to force majeure, or any reason foreign to the equipment.

2.9

Any specific services or procedures, asked for by Customer, related to verification of repaired equipment.

2.10 The evaluation cost in case of a returned product deemed functional is not covered under warranty and will be charged to the Customer, at Barco's sole discretion, based on a case-by-case evaluation.

### **ARTICLE 3: OBLIGATIONS OF THE CUSTOMER**

Customer hereby assumes the following obligations as partial consideration for Barco nv, MID performance of its requirements under the warranty condition; failure by Customer to meet its obligations under this paragraph shall excuse Barco nv, MID's performance hereunder:

3.1

Customer shall not expose Barco nv, MID personnel to any unsafe working conditions.

3.2

Repairs to equipment under warranty resulting from improper maintenance or repair performed by the Customer, or its officers, agents, employees, or representatives, shall be borne by the Customer at its additional cost and expense.

3.3

The Customer is responsible for installing the Barco nv, MID equipment in an environment for which it was intended. If there is an indication that the equipment was used – even temporary – outside its specifications, Barco nv, MID is entitled not to perform warranty repairs and terminate the warranty agreement. Any actions that have been taken by Barco nv, MID in this respect, may be invoiced to the Customer at normal pricing.

### **ARTICLE 4: REMEDIES UNDER WARRANTY**

(a) Hardware: If during the Warranty Period a Product or any part thereof, fails to meet any of the Warranties then, upon Customer's request, Barco shall, at its sole option and cost, promptly and within 20 working days, either: (i) repair or correct the Product or part in question; or (ii) replace the Product or supply part(s) or component(s) according to the terms and conditions contained in article 1. A replacement part shall be at least functionally equivalent to the original part. The replaced Product, parts and/or components shall become the property of Barco and shall, at Barco's request, be returned by Customer to Barco at Barco's cost.

(b) Software: Barco's sole obligation shall be to rectify substantial malfunctions of the software (to the extent technically reasonably possible) by amending the software or supplying an alternative

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version of the software.

(c) The repair or replacement under the Warranties covers the cost of material and labor.

#### **ARTICLE 5: DISCLAIMER OF WARRANTIES**

BARCO NV, MID DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

#### **ARTICLE 6: LIMITATION OF LIABILITY**

BARCO NV, MID SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, SUCH AS BUT NOT LIMITED TO, DAMAGE TO OR LOSS OF TANGIBLE OR INTANGIBLE PROPERTY OR EQUIPMENT, LOSS OF PROFITS OR REVENUES, COST OF CAPITAL, COST OF PURCHASE OF REPLACEMENT GOODS, OR CLAIMS OF CUSTOMERS OF USER FOR SERVICE INTERRUPTIONS. THE LIABILITY OF BARCO NV, MID FOR MANUFACTURING, SALE, DELIVERY, RESALE, INSTALLATION, OPERATION OR SUITABILITY FOR USE OF ANY PRODUCTS OR SERVICES COVERED BY OR FURNISHED UNDER THIS WARRANTY CONDITION, WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, STRICT TORT, WARRANTY OR OTHERWISE, SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT OF THE PRODUCT OR ANY PART THEREOF WHICH SHALL BE AT CUSTOMER'S SOLE OPTION AND COST. BARCO'S LIABILITY SHALL NOT EXCEED THE PRICE OF THE ITEM OR ITEMS OF GOODS OR SERVICES UPON WHICH SUCH LIABILITY IS BASED.

#### **ARTICLE 7: FORCE MAJEURE**

Either party shall be released from performance of its obligations under this agreement to the extent, and for so long as, the performance of this agreement is impeded by reason of force majeure. For the purposes of this clause the expression "force majeure" means, but shall not be limited to, industrial dispute, fire, mobilisation, requisition, embargo, currency transfer prohibitions, insurrection, lack of means of transport, restrictions of the use of energy, and generally any circumstances which are beyond the control of the parties and hinder performance by one party of his obligations.

#### **ARTICLE 8: GENERAL**

8.1

Customer acknowledges its understanding that all software and electronic devices, including Barco nv, MID products are subject to possible error, mechanical or electrical failure, and should not be relied upon in inappropriate applications or without proper backup and/or other safety precautions whenever personal injury or property damage may result from failure or error of the product.

8.2

Barco nv, MID shall not be responsible for machine failure and/or its failure to render service or maintenance due to causes beyond its reasonable control.



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**Barco nv Medical Imaging**  
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**[www.barco.com](http://www.barco.com)**