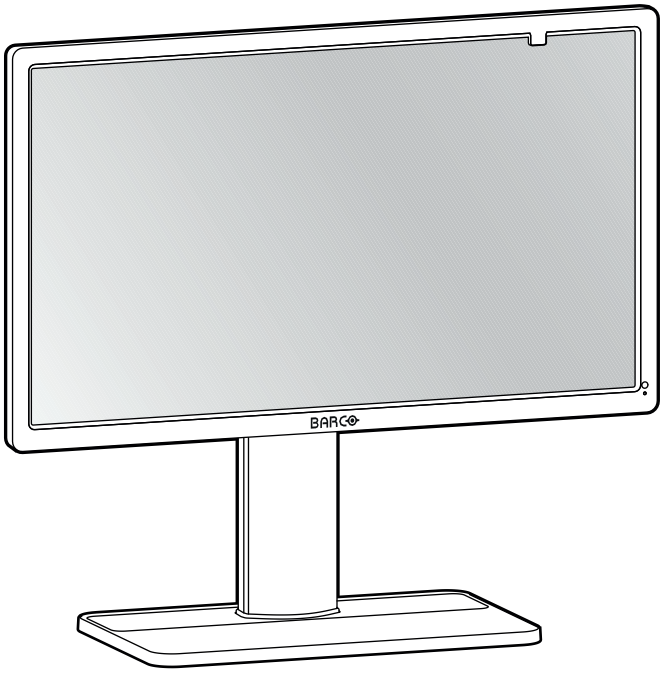
Nio Color 2MP 23"



User Guide

MDNC-2123 (option DE)

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1 Welcome!

Overview

Thank you for choosing this Nio Color 2MP 23" display!

Barco's Nio Color 2MP 23" display (MDNC-2123) has everything it takes for your dental practice. It brings sharp and bright images to your desktop in a stylish but cleanable design.

Did you know?

New regulations (DIN 6868-157) in the dental market define strict standards for displays. It means you'll need a specific monitor, depending on the lighting conditions in your work environment.

That's why Barco developed a range of displays for the dental practice. One for every environment. Ready to use out of the box.

Reliable diagnosis in your dental office

The Nio Color 2MP 23" display has been built for use in your reading or treatment room (room classes 5 and 6 as defined by DIN 6868-157). Its high brightness and contrast make subtle details, such as early caries or microcracks, more visible. So you can make a precise diagnosis based on reliable images.

Automated quality control

The Nio Color 2MP 23" is always up to standard because of Barco's luminance sensor technology and MediCal QAWeb software. By constantly measuring and monitoring display brightness, we can ensure that your dental images will look consistent and accurate over time and across displays. It also ensures that the display conforms with DIN 6868-157, automatically.

Compliant with medical safety standards

The Nio Color 2MP 23" display is available with a protective cover (optional) for easy cleaning while complying with the medical 60601-1 safety standard. We recommend the version with optional cover if you want to give your patients a clear picture of their oral health.

CAUTION: Read all the important safety information before installing and operating your Nio Color 2MP 23". Please refer to the dedicated chapter in this user guide.

Warnings, cautions, notes and tips

There are four levels of precautionary or advisory statements that may be used in this user guide. In descending order of importance, they are:

WARNING: Describes hazards or dangers that might result in personal injury or death.

CAUTION: Describes hazards that could damage the product.

Gives additional information about the described subject.

Gives extra advice about the described subject.

1.1 What's in the box

Overview

- 1x Nio Color 2MP 23" display
- 1x stand base plate
- 1x user guide
- 1x system disc
- 1x documentation disc
- 1x video signal cable
- 1x USB cable
- 1x set of AC power cords (depending on the region of operation)

Keep your original packaging. It is designed for this display and is the ideal protection during transport and storage.

1.2 Product overview

Front

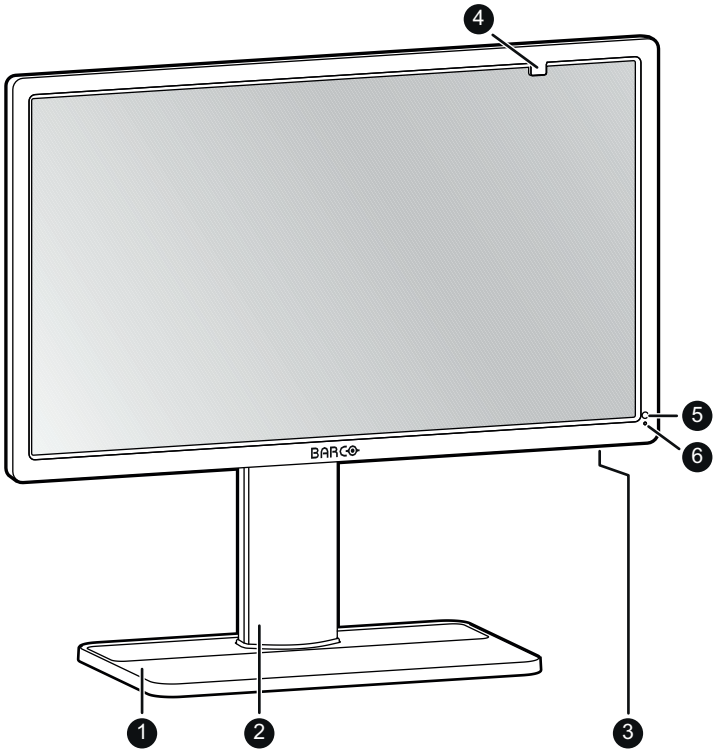


Image 1-1

1. Stand base plate
2. Stand pillar
3. Jog dial
   - Push long (5 sec):
     - to put the display in standby mode
   - Push short:
     - to exit standby mode
     - to activate the OSD menu
     - to confirm selections in the OSD menu
   - Turn right
     - to scroll up in the OSD menu

  - to increase values in the OSD menu
- Turn left
  - to scroll down in the OSD menu
  - to decrease values in the OSD menu

4. Front sensor
5. Ambient light sensor
6. Power status LED
   - Off: Display is in normal operation mode, or display is not powered
   - Blinking orange: Display is entering standby mode
   - Steady orange: Display is in standby mode

Back

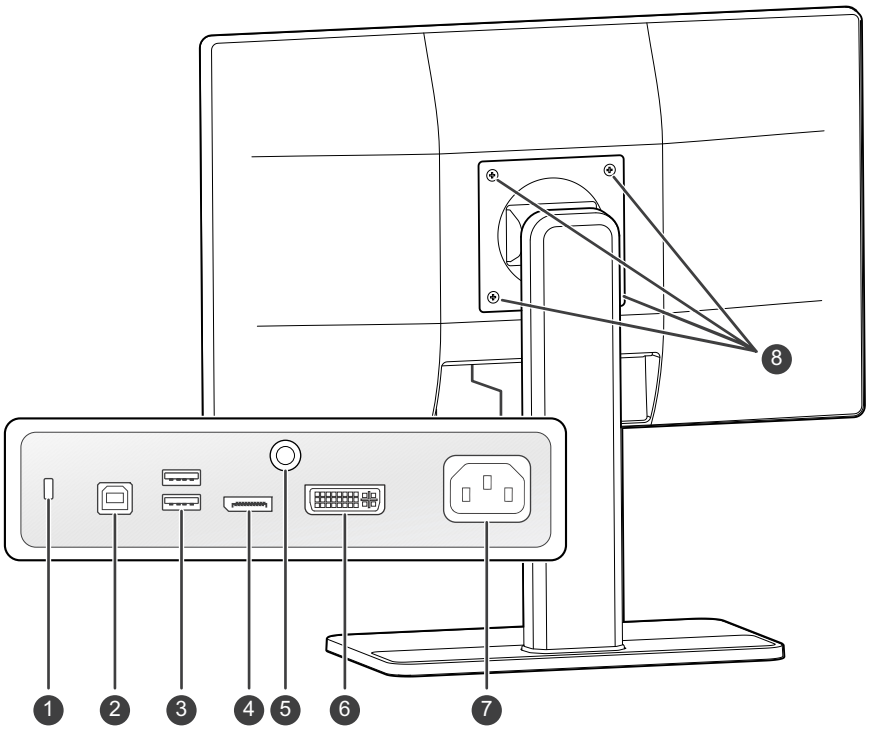


Image 1-2

1. Kensington security slot
2. USB-B 2.0 upstream connector
3. USB-A 2.0 downstream connectors (2x)
4. DisplayPort video input
5. Earth pin
6. DVI-D video input
7. 100 - 240 VAC mains power input (IEC C14)
8. VESA 100 mm mounting screw holes (4x)

Installation 2

WARNING: Read all the important safety information before installing and operating your monitor. Please refer to the dedicated chapter in this user guide.

WARNING: Sufficient expertise is required to install this equipment. All devices and complete setup must be tested before taking into operation.

CAUTION: When the display is assembled in the medical system, take care of the fixation of all cables, to avoid unwanted detachment.

CAUTION: The monitor is not intended to be sterilized.

2.1 Stand base plate mounting

To mount the stand base plate

1. Put the display face down on a clean and soft surface. Be careful not to damage the panel.
2. Rotate the stand pillar 90° counterclockwise.

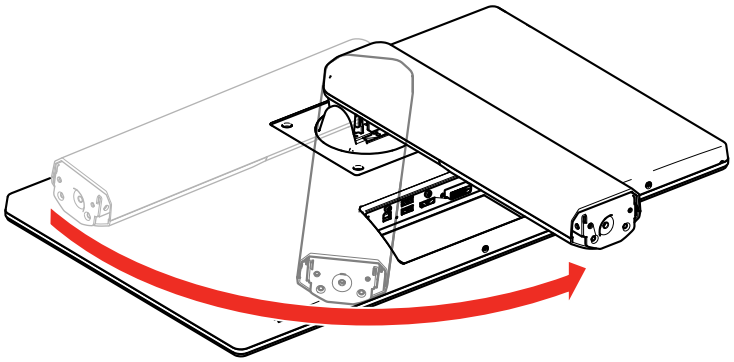


Image 2-1

3. Attach the stand base plate to the pillar by fixing the dedicated screw as shown below.

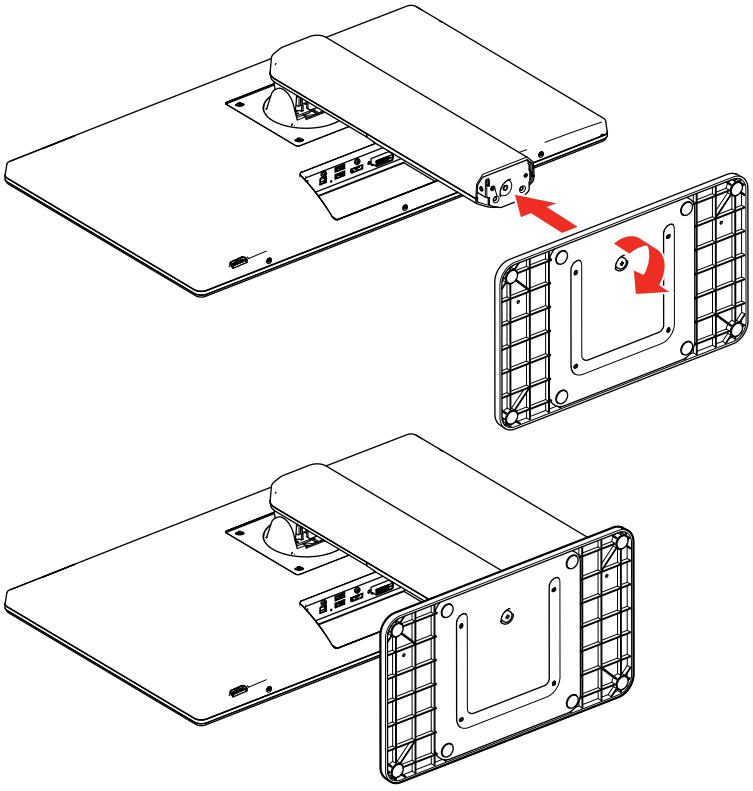


Image 2-2

2.2 Cable connections

To connect the cables

1. Connect one or more video source(s) to the corresponding video inputs. Use the appropriate video cable(s) to do this.

   The input source to be displayed can be selected in the OSD menus (see “Input source selection”, page 17).

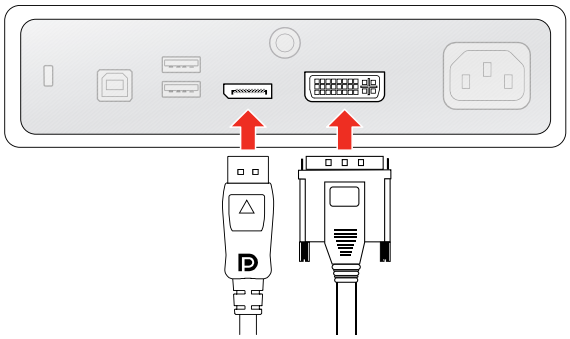


Image 2-3

2. Connect the USB upstream connector to a PC USB host to make use of QAWeb or any of the display USB downstream connectors (e.g. to connect a keyboard, mouse or other peripheral).

Image 2-4

3. Connect the mains power input to a **grounded** power outlet.

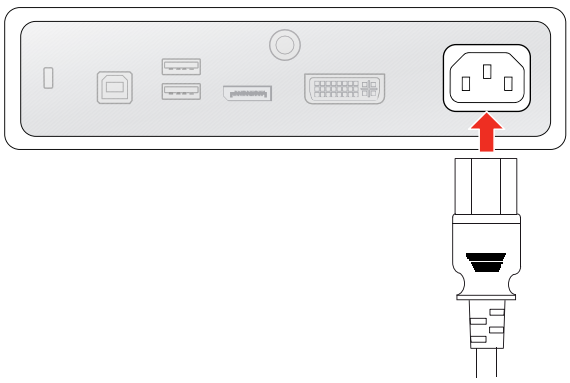


Image 2-5

4. If necessary for your application, earth the Nio Color 2MP 23" by connecting the earth pin to a grounded outlet by means of a yellow/green AWG18 wire (maximum admitted cable length according to national regulation requirements).

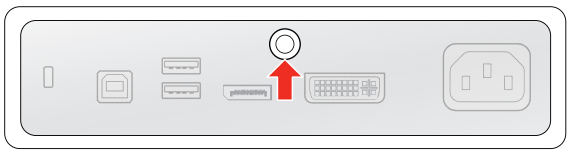


Image 2-6

5. Route all cables through the provided cable routing clip at the back of the display stand.

2.3 Display position adjustment

To adjust the display position

You can safely tilt, raise and lower the display as desired.

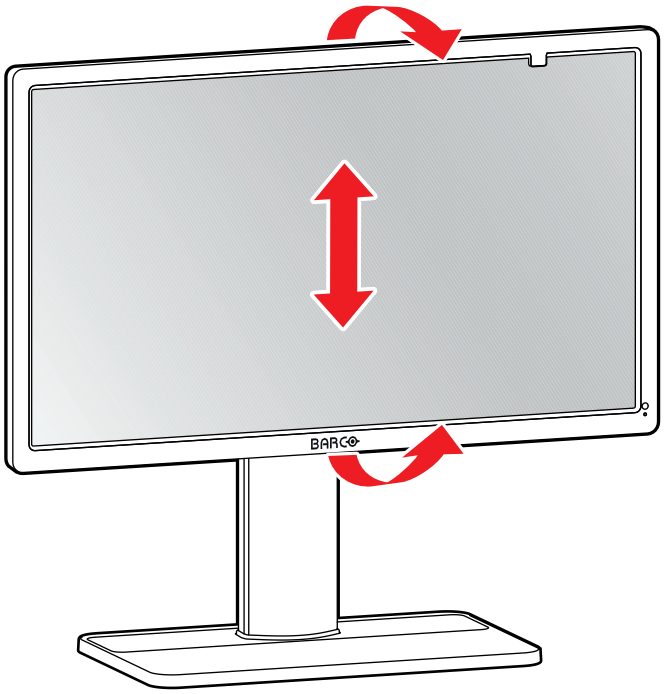


Image 2-7

CAUTION: Although the display can be physically rotated to portrait position, this mode is functionally not supported.

2.4 VESA-mount installation

To mount the display on a VESA arm

The display panel, standard attached to the stand, is compatible with the VESA 100 mm standard.

1. Unscrew the four fixation screws to detach the panel from the stand.

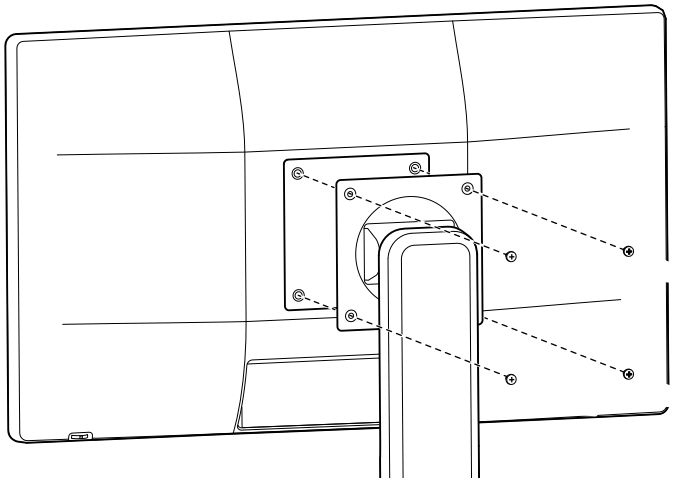


Image 2-8

2. Use 4 M4 screws to attach the panel to a VESA approved arm. Please respect the following rule to select an appropriate screw length:
   - L_{min} = T + W + 6 mm
   - L_{max} = T + W + 14 mm

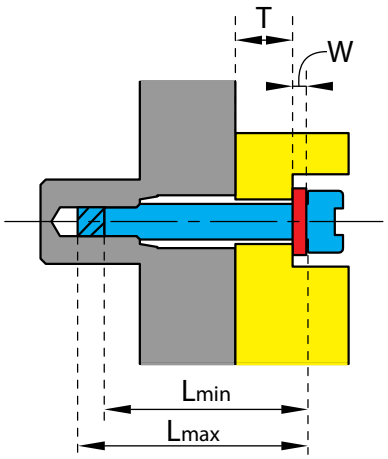


Image 2-9

3 Operation

3.1 Recommendations for daily operation

Optimize the lifetime of your display

Enabling the Display Power Management System (DPMS) of your display will optimize its 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.

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.

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 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 papers available at www.barco.com/healthcare.

Maximize quality assurance

QAWeb guarantees optimum and stabilized image quality in every private practice.

The front sensor on the Nio Color 2MP 23" works seamlessly with QAWeb to ensure a consistent image over time. It automatically stabilizes the image from the moment you switch on the display. What's more, QAWeb provides you with instant feedback on the status of the display.

3.2 Standby switching

About

- Push the jog dial long (5 sec) to put your display in standby mode
- Push the jog dial short (1 sec) to exit standby mode and activate your display

3.3 OSD menu use

To open the OSD menu

Shortly push the jog dial during normal operation to open the OSD menu. If the *OSD locked* message appears, first unlock it as described in “OSD menu locking/unlocking”, page 17.

The OSD main menu comes up in the left top of the screen. If no further actions are taken within the next 20 seconds, the OSD menu will disappear again (and the keyboard will lock if enabled).

To navigate the OSD menu

- Turn the jog dial left or right to scroll through the different menu pages, to change values or to make selections.
- Push the jog dial to go into a submenu or confirm adjustments and selections.

3.4 OSD menu locking/unlocking

About

To avoid unwanted or accidental activation of the OSD menu, a lock mechanism can be enabled. This mechanism will automatically lock the OSD menu when it's not in use.

To lock the OSD menu

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *Settings* > *OSD lock* menu.
3. Switch OSD menu lock on or off.
4. Exit the OSD menu to activate the selected option.

To unlock the jog dial

During normal operation, turn and hold the jog dial **right for 5 seconds**, until the *OSD unlocked* message appears.

3.5 Input source selection

About input source selection

The Nio Color 2MP 23" can have multiple video inputs connected. Switching between the different inputs can be done easily in the OSD menu.

To select the input source

1. Bring up the OSD main menu.
2. Navigate to the *Input selection* menu.
3. Select one of the available input sources and confirm.

3.6 Luminance adjustment

To adjust the luminance

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *Luminance* menu.
3. Set a luminance value as desired and confirm.

3.7 sRGB color space

About sRGB color space

The sRGB color space combines a display function and white point selection and is designed to match typical home and office viewing conditions. It is widely used in most computer applications.

When selecting *sRGB*, the *Display function* and *White point* selection options in the *Adjustments* menu will be disabled.

To select sRGB color space

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* menu.
3. Select *sRGB* and confirm.

3.8 Display functions

Display function selection is disabled when *sRGB* is selected in the *Adjustments* menu.

About display functions

Native, uncorrected panels will display all grayscale/color levels with luminance increments that are not optimal for crucial diagnostic information. Studies have shown however, that in medical images certain grayscale/color parts contain more diagnostic information then others. To respond to these conclusions, display functions have been defined. These functions emphasize on these parts containing crucial diagnostic information by correcting the native panel behavior.

The available display functions for your Nio Color 2MP 23" are:

- *Native*: If you select Native, the native panel behavior will not be corrected.
- *DICOM*: DICOM (Digital Imaging and Communications in Medicine) is an international standard that was developed to improve the quality and communication of digital images in radiology. In short, the DICOM display function results in more visible grayscales in the images. Barco recommends selecting the DICOM display function for most medical viewing applications.
  The DICOM display function applies ambient light compensation (ALC) taking the ambient light conditions of your reading room into account. The available reading room options are:
  - *Darkroom*: Selects DICOM calibrated function, optimized for darkroom conditions (0 Lux)
  - *Office*: Selects DICOM function optimized for office conditions (60-180 Lux)
  - *Operation Room*: Selects DICOM function optimized for operating room conditions (300-400 Lux)
- *Gamma 1.8* or *2.2*: Select one of these display functions in case the display is to replace a CRT display with a gamma of 1.8 or 2.2 respectively.
- *QAWeb:* This setting is automatically selected when the display function is determined by Barco's MediCal QAWeb application. Manually selecting the *QAWeb* display function is not recommended.

The settings of the display must be adapted to suit the requirements of the visualization software. In case of doubt, please contact the vendor of the visualization software.

To select a display function

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *Display function* menu.
3. Select one of the available display functions and confirm.

3.9 White point selection

White point selection is disabled when *sRGB* is selected in the *Adjustments* menu.

About white point selection

This setting allows you to modify the display white point, used as reference for all other colors to be displayed.

The available white point settings for your display are:

- *Native*: The native, unmodified color temperature of the LCD panel.
- *6500K*: Corresponds to a color temperature of 6500 Kelvin (D65).
- *7500K*: Corresponds to a color temperature of 7500 Kelvin (D75).

To select the white point

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *White point* menu.
3. Select one of the available white point presets.

3.10 Power save mode

About power save mode

Enabling power save mode on your Nio Color 2MP 23" will optimize the display lifetime by automatically switching off the backlight when no video signal is detected after approximately 10 seconds.

To enable/disable power save mode

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *Settings* menu.
3. Enter the *Power save* submenu.
4. Select *On* or *Off* as desired and confirm.

3.11 OSD menu language

About the OSD menu language

By default, the OSD menu comes up in English. However, there's a wide range of other languages available for the OSD menu of your Nio Color 2MP 23".

To select the language of the OSD menu

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *Settings* menu.
3. Enter the *OSD Language* submenu.
4. Select one of the available languages.

3.12 Factory reset

About factory reset

A factory reset allows you to fully restore the display to its original factory setting.

To perform a factory reset

1. Bring up the OSD main menu.
2. Navigate to the *Adjustments* > *Settings* menu.
3. Enter the *Factory Reset* submenu.
4. Select *Press enter to confirm*.

4 Maintenance

4.1 Scheduled maintenance

About

The Nio Color 2MP 23" does not require any scheduled maintenance or calibration activities. We recommend to use QAWeb with the Barco default tests and frequencies to calibrate and maintain the display, or to return the display to a Barco approved maintenance organization. In any case of doubts, please contact Barco Healthcare.

4.2 Cleaning

WARNING: Unplug the power cable from the mains power input before cleaning the display.

CAUTION: Take care not to damage or scratch the front glass or LCD. Be careful with rings or other jewelry and do not apply excessive pressure on the front glass or LCD.

CAUTION: Do not apply or spray liquid directly to the display as excess liquid may cause damage to internal electronics. Instead, apply the liquid to a cleaning cloth.

To clean the display

Clean the display using a sponge, cleaning cloth or soft tissue, lightly moistened with a recognized cleaning product for medical equipment. Read and follow all label instructions on the cleaning product. In case of doubt about a certain cleaning product, use plain water.

Possible cleaning solutions:

- 70% isopropyl alcohol
- 1.6% aqueous ammonia
- Cidex® (2.4% glutaraldehyde solution)
- Sodium hypochlorite (bleach) 10%
- “Green soap” (USP)
- 0.5% Chlorehexidine in 70% isopropyl alcohol
- Like Cleansafe® optical cleaning liquid

Do not use following products:

- Alcohol/solvents at higher concentration > 70%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride
- Detergents with ammonia at higher concentration > 1.6%
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread

Important information

5

5.1 Safety information

General recommendations

Read the safety and operating instructions before operating the device.

Retain safety and operating instructions for future reference.

Adhere to all warnings on the device and in the operating instructions manual.

Follow all instructions for operation and use.

Electrical Shock or Fire Hazard

To prevent electric shock or fire hazard, do not remove cover.

No serviceable parts inside. Refer servicing to qualified personnel.

Do not expose this apparatus to rain or moisture.

Modifications to the unit

Do not modify this equipment without authorization of the manufacturer.

Type of protection (electrical)

Monitor with internal power supply: Class I equipment.

Degree of safety (flammable anesthetic mixture)

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Non-patient care equipment

- Equipment primarily for use in a health care facility that is intended for use where contact with a patient is unlikely (no applied part).
- The equipment shall not be used with life support equipment.
- The user should not touch the equipment, nor its signal input ports (SIP)/signal output ports (SOP) and the patient at the same time.

Power connection – Equipment with internal power supply

- Power requirements: The equipment must be powered by the AC mains voltage and must be connected to a mains socket with earth connection.
- The equipment is intended for continuous operation.

Transient over-voltage

If the device is not used for a long time, disconnect it from the AC inlet to avoid damage by transient over-voltage.

To fully disengage the power to the device, please disconnect the power cord from the AC inlet.

High magnetic environment

- The device shall not be used in the high magnetic environment of an MRI scanner.
- The installer shall assess the magnetic environment before installation or use of the device.

Connections

Any external connection with other peripherals must follow the requirements of clause 16 of IEC60601-1 3rd. Ed. or Table BBB.201 of IEC 60601-1-1 for the medical electrical systems.

To maintain compliance with EMC Regulation, use only shielded interface cables for the connection to peripheral devices.

Power cords

- Europe: H05VV-F or H05VVH2-F PVC cord with appropriate EU plug.
  US and Canada: “hospital grade” cord-set has to be used, provided with instructions to indicate that grounding reliability can be achieved only when the equipment is connected to an equivalent receptacle marked hospital only or hospital grade. These instructions need to be marked either on the equip. or on a tag on the power cord
- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection: 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.
- The power supply cord shall only be replaced by the designated operator.
- Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.

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.

Moisture condensation

Do not use monitor under rapid temperature and humidity change condition or avoid cold air from air-conditioning outlet directly.

Moisture may condense on the surface or inside of the unit, or create a mist residue inside the protection plate, this is not a malfunction of the product itself, although it may cause damage to the monitor.

If condensation appears, let the monitor stand unplugged until the condensation disappears.

Ventilation

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

Installation

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

National Scandinavian Deviations for CL. 1.7.2

Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"

Norway: "Apparatet må tilkoples jordet stikkontakt"

Sweden: "Apparaten skall anslutas till jordat uttag"

5.2 Environmental information

Disposal Information

Waste Electrical and Electronic Equipment

This symbol on the product indicates that, under the European Directive 2012/19/EU governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

For more information about recycling of this product, please contact your local city office or your municipal waste disposal service.

For details, please visit the Barco website at: *http://www.barco.com/AboutBarco/weee*

Turkey RoHS compliance

Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

[Republic of Turkey: In conformity with the WEEE Regulation]

中国大陆 RoHS

Chinese Mainland RoHS

根据中国大陆《电器电子产品有害物质限制使用管理办法》（也称为中国大陆RoHS），以下部分列出了Barco产品中可能包含的有毒和/或有害物质的名称和含量。中国大陆RoHS指令包含在中国信息产业部MCV标准：“电子信息产品中有毒物质的限量要求”中。

According to the “Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products ” (Also called RoHS of Chinese Mainland), the table below lists the names and contents of toxic and/or hazardous substances that Barco’s product may contain. The RoHS of Chinese Mainland is included in the MCV standard of the Ministry of Information Industry of China, in the section “Limit Requirements of toxic substances in Electronic Information Products”.

零件项目(名称) **Component name**	有毒有害物质或元素 **Hazardous substances and elements**					
	铅 **Pb**	汞 **Hg**	镉 **Cd**	六价铬 **Cr6+**	多溴联苯 **PBB**	多溴二苯醚 **PBDE**
印制电路配件 Printed Circuit Assemblies	x	o	o	o	o	o
液晶面板 LCD panel	x	o	o	o	o	o
外接电(线)缆 External Cables	x	o	o	o	o	o
内部线路 Internal wiring	o	o	o	o	o	o
金属外壳 Metal enclosure	o	o	o	o	o	o
塑胶外壳 Plastic enclosure	o	o	o	o	o	o
散热片(器) Heatsinks	o	o	o	o	o	o
电源供应器 Power Supply Unit	x	o	o	o	o	o
风扇 Fan	o	o	o	o	o	o
文件说明书 Paper Manuals	o	o	o	o	o	o

零件项目(名称) Component name	有毒有害物质或元素 Hazardous substances and elements					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6+	多溴联苯 PBB	多溴二苯醚 PBDE
光盘说明书 CD manual	o	o	o	o	o	o

本表格依据SJ/T 11364的规定编制

This table is prepared in accordance with the provisions of SJ/T 11364.

o: 表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下.

o: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

x: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 标准规定的限量要求.

x: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.

在中国大陆销售的相应电子信息产品（EIP）都必须遵照中国大陆《电子电气产品有害物质限制使用标识要求》标准贴上环保使用期限（EFUP）标签。Barco产品所采用的EFUP标签（请参阅实例，徽标内部的编号使用于指定产品）基于中国大陆的《电子信息产品环保使用期限通则》标准。

All Electronic Information Products (EIP) that are sold within Chinese Mainland must comply with the “Marking for the restriction of the use of hazardous substances in electrical and electronic product” of Chinese Mainland, marked with the Environmental Friendly Use Period (EFUP) logo. The number inside the EFUP logo that Barco uses (please refer to the photo) is based on the “General guidelines of environment-friendly use period of electronic information products” of Chinese Mainland.

5.3 Biological hazard and returns

Overview

The structure and the specifications of this device as well as the materials used for manufacturing makes it easy to wipe and clean and therefore suitable to be used for various applications in hospitals and other medical environments, where procedures for frequent cleaning are specified.

However, normal use shall exclude biological contaminated environments, to prevent spreading of infections.

Therefore use of this device in such environments is at the exclusive risk of Customer. In case this device is used where potential biological contamination cannot be excluded.

Customer shall implement the decontamination process as defined in the latest edition of the ANSI/AAMI ST35 standard on each single failed Product that is returned for servicing, repair, reworking or failure investigation to Seller (or to the Authorized Service Provider). At least one adhesive yellow label shall be attached on the top site of the package of returned Product and accompanied by a declaration statement proving the Product has been successfully decontaminated.

Returned Products that are not provided with such external decontamination label, and/or whenever such declaration is missing, can be rejected by Seller (or by the Authorized Service Provider) and shipped back at Customer expenses.

5.4 Regulatory compliance information

Intended use

The display is intended to be used for displaying and viewing digital images (excluding digital mammography) for review and analysis by trained medical practitioners.

Indications for use

The device can come in contact with the patient for short handling of the unit such as adjusting position. The duration of this contact will be less than 1 minute.

Caution (USA): Federal law restricts this device to sale by or on the order of a physician. (Details & exemptions are in the Code of Federal Regulations Title 21, 801 Part D).

Contra-indications

The device is not intended for digital mammography.

Intended users

Barco diagnostic displays are intended to be used for primary diagnosis by trained medical practitioners. The device is initially set up by trained integrators or medical IT staff.

Manufacturing country

The manufacturing country of the product is indicated on the product label ("**Made in** …").

Importers contact information

To find your local importer, contact one of Barco's regional offices via the contact information provided on our website (*www.barco.com*).

FCC class B

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.

This device 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 device 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. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device 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 device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

FCC responsible: Barco Inc., 3059 Premiere Parkway Suite 400, 30097 Duluth GA, United States, Tel: +1 678 475 8000

Canadian notice

CAN ICES-1/NMB-1

5.5 EMC notice

General information

This device is for use in professional healthcare facility environments only.

With the installation of the device, use only the delivered external cables and power supply or a spare part provided by the legal manufacturer. Using another can result in a decrease of the immunity level of the device.

WARNING: Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

WARNING: Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

WARNING: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Nio Color 2MP 23", including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Electromagnetic emissions

The Nio Color 2MP 23" is intended for use in the electromagnetic environment specified below. The customer or the user of the Nio Color 2MP 23" should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – Guidance
RF emissions CISPR 11	Group 1	The Nio Color 2MP 23" 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 B	The Nio Color 2MP 23" 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.
Harmonic emissions IEC 61000-3-2	Class D	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

This Nio Color 2MP 23" complies with appropriate medical EMC standards on emissions to, and interference from surrounding equipment. 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.

Interference can be determined by turning the equipment off and on.

If this equipment does cause harmful interference to, or suffer from harmful interference of, surrounding equipment, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna or equipment.
- 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 the dealer or an experienced technician for help.

Electromagnetic immunity

The Nio Color 2MP 23" is intended for use in the electromagnetic environment specified below. The customer or the user of the Nio Color 2MP 23" should assure that it is used in such an environment.

Immunity test	IEC 60601 test levels	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 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	± 2 kV for power supply lines	± 2 kV for power supply lines	Mains power quality should be that of a typical

Immunity test	IEC 60601 test levels	Compliance level	Electromagnetic environment – guidance
IEC 61000-4-4	± 1 kV for input/ output lines 100 kHz repetition frequency	± 1 kV for input/ output lines 100 kHz repetition frequency	commercial or hospital environment
Surge IEC61000-4-5	Line to line: ± 0.5 kV, ± 1 kV Line to ground: ± 0.5 kV, ± 1 kV, ± 2 kV	Line to line: ± 0.5 kV, ± 1 kV Line to ground: ± 0.5 kV, ± 1 kV, ± 2 kV	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	0% residual voltage for 0.5 period at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0% residual voltage for 1 period at 0° 70% residual voltage for 25 periods at 0° Voltage interruptions: 0% residual voltage for 250 periods at 0°	0% residual voltage for 0.5 period at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0% residual voltage for 1 period at 0° 70% residual voltage for 25 periods at 0° Voltage interruptions: 0% residual voltage for 250 periods at 0°	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Nio Color 2MP 23" requires continued operation during power mains interruptions, it is recommended that the Nio Color 2MP 23" be powered from an uninterruptible power supply or a battery
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	Not applicable [1]	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
Conducted RF IEC 61000-4-6	3 Vrms (6 Vrms in ISM bands) 150 kHz to 80 MHz	3 Vrms (6 Vrms in ISM bands)	-
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz	3 V/m	

Immunity to RF wireless communications equipment

Test frequency (MHz)	Band (MHz)	Service	Modulation	Maximum power (W)	Distance (m)	Immunity test level (V/m)
385	380 – 390	TETRA 400	Pulse modulation 18 Hz	1.8	0.3	27
450	430 – 470	GMRS 460, FRS 460	FM ± 5 kHz deviation 1 kHz sine	2	0.3	28
710	704 – 787	LTE Band 13, 17	Pulse modulation 217 Hz	0.2	0.3	9
745						
780						
810	800 – 960	GSM 800/ 900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	2	0.3	28
870						
930						

1: Nio Color 2MP 23" doesn't contain susceptible components to magnetic fields

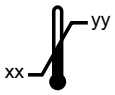
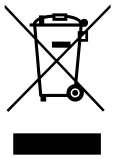
Test frequency (MHz)	Band (MHz)	Service	Modulation	Maximum power (W)	Distance (m)	Immunity test level (V/m)
1720	1700 – 1990	GSM 1800, CDMA 1900, GSM 1900, DECT, LTE Band 1/3/4/25, UMTS	Pulse modulation 217 Hz	2	0.3	28
1845						
1970						
2450	2400 – 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217 Hz	2	0.3	28
5240	5100 – 5800	W LAN 802.11 a/n	Pulse modulation 217 Hz	0.2	0.3	9
5500						
5785						

5.6 Explanation of symbols

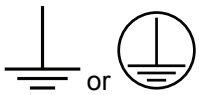
Symbols on the device

On the device or power supply, you may find the following symbols (nonrestrictive list):

	Indicates compliance with Part 15 of the FCC rules (Class A or Class B)
	Indicates the device is approved according to the UL regulations
	Indicates the device is approved according to the UL regulations for Canada and US
	Indicates the device is approved according to the UL regulations for Canada and US
	Indicates the device is approved according to the UL Demko regulations
	Indicates the device is approved according to the CCC regulations
	Indicates the device is approved according to the VCCI regulations
	Indicates the device is approved according to the KC regulations

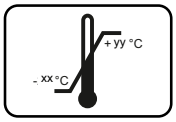
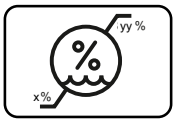
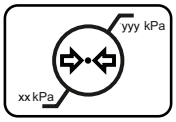
	Indicates the device is approved according to the BSMI regulations
	Indicates the device is approved according to the PSE regulations
	Indicates the device is approved according to the EAC regulations
	Caution: Federal law (United Stated of America) restricts this device to sale by or on the order of a licensed healthcare practitioner.
	Indicates the USB connectors on the device
	Indicates the DisplayPort connectors on the device
	Indicates the legal manufacturer
	Indicates the manufacturing date
	Indicates the temperature limitations[2] for the device to safely operate within specs
	Indicates the device serial number
	Indicates the device part number or catalogue number
	**Warning**: dangerous voltage
	**Caution**
	Consult the operating instructions
	Indicates this device must not be thrown in the trash but must be recycled, according to the European WEEE (Waste Electrical and Electronic Equipment) directive
	Indicates Direct Current (DC)
	Indicates Alternating Current (AC)

2: Values for xx and yy can be found in the technical specifications paragraph.

	Stand-by
	Equipotentiality
	Protective earth (ground)

Symbols on the box

On the box of the device, you may find the following symbols (nonrestrictive list):

	Indicates a medical device that can be broken or damaged if not handled carefully when being stored.
	Indicates a medical device that needs to be protected from moisture when being stored.
	Indicates the storage direction of the box. The box must be transported, handled and stored in such a way that the arrows always point upwards.
	Indicates the maximum number of boxes to be stacked on each other.
	Indicates that the box should be carried with two persons.
	Indicates that the box should not be cut with a knife, a cutter or any other sharp object.
	Indicates the temperature limits to which the medical device can be safely exposed when being stored.
	Indicates the range of humidity to which the medical device can be safely exposed when being stored.
	Indicates the range of atmospheric pressure to which the medical device can be safely exposed when being stored.

5.7 Legal disclaimer

Disclaimer 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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Copyright notice

Patent protection

Please refer to *www.barco.com/about-barco/legal/patents*

5.8 Technical specifications

Overview

Screen technology	LCD
Active screen size (diagonal)	598 mm (23.6")
Active screen size (H x V)	521 x 293 mm (20.5 x 11.5")
Aspect ratio (H:V)	16:9
Resolution	2MP (1920 x 1080 pixels)
Pixel pitch	0.2715 mm
Color imaging	Yes
Gray imaging	Yes
Bit depth	30 bit
Viewing angle (H, V)	178°
Ambient light presets	Yes, reading room selection
Ambient light sensor	Yes
Front sensor	Yes
Maximum luminance (panel typical)	460 cd/m²
DICOM calibrated luminance	370 cd/m²
Contrast ratio (panel typical)	1000:1
Response time ((Tr + Tf)/2) (typical)	15 ms
Housing color	RAL 9003
Video input signals	1x DVI 1x DisplayPort
USB ports	1x USB 2.0 upstream (endpoint)

	2x USB 2.0 downstream
Power requirements	Internal power supply (100-240 Vac, 50-60 Hz)
Power consumption	25 W (nominal) < 0.5 W (hibernate) < 0.5 W (standby)
Dimensions with stand (W x H x D)	560 x 412~512 x 202 mm
Dimensions w/o stand (W x H x D)	560 x 335 x 61 mm
Dimensions packaged (W x H x D)	700 x 465 x 230 mm
Net weight with stand	Option DE WP: 7.2 kg Option DE WH: 5.9 kg
Net weight w/o stand	Option DE WP: 5.0 kg Option DE WH: 3.7 kg
Net weight packaged	Option DE WP: 10.2 kg Option DE WH: 8.9 kg
Tilt	-1° to +24°
Pivot	90°
Height adjustment range	100 mm (landscape)
Mounting standard	VESA (100 mm)
Screen protection	Option DE WP: Protective, anti-reflective glass cover Option DE WH: N/A
Recommended modalities	All digital images, except digital mammography
Certifications	FDA 510(K) K171812 for General Radiology CE1639 (MDD 93/42/EEC; A1:2007/47/EC class IIb product) CCC (China) Safety specific: IEC 60950-1:2005 + A1:2009 EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013 IEC 60601-1:2005 + A1:2012 EN 60601-1:2006 + A1:2013 + A12:2014 ANSI/AAMI ES 60601-1:2005 + R1:2012 CAN/CSA C22.2 No. 60601-1:14 EMI specific: IEC 60601-1-2:2014 (ed4) EN 60601-1-2:2015 (ed4) FCC part 15 Class B ICES-001 Level B VCCI (Japan) Environmental: China Energy Label, EU RoHS, China RoHS, REACH, Canada Health, WEEE, Packaging Directive
Supplied accessories	User guide

	Documentation disc System disc DisplayPort video cable AC mains cable USB cable
QA software	MediCal QAWeb
Warranty	Minimum 3 years, including 20,000 hours backlight warranty Please check the Barco Terms & Conditions for specific Warranty conditions.
Operating temperature	0 °C to 40 °C (15 °C to 35 °C within specs)
Storage temperature	-20 °C to 60 °C
Operating humidity	8% to 80% (non-condensing)
Storage humidity	5% to 85% (non-condensing)
Operating pressure	70 kPa minimum
Storage pressure	50 to 106 kPa

CE
1639

Barco NV
President Kennedypark 35
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Belgium

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