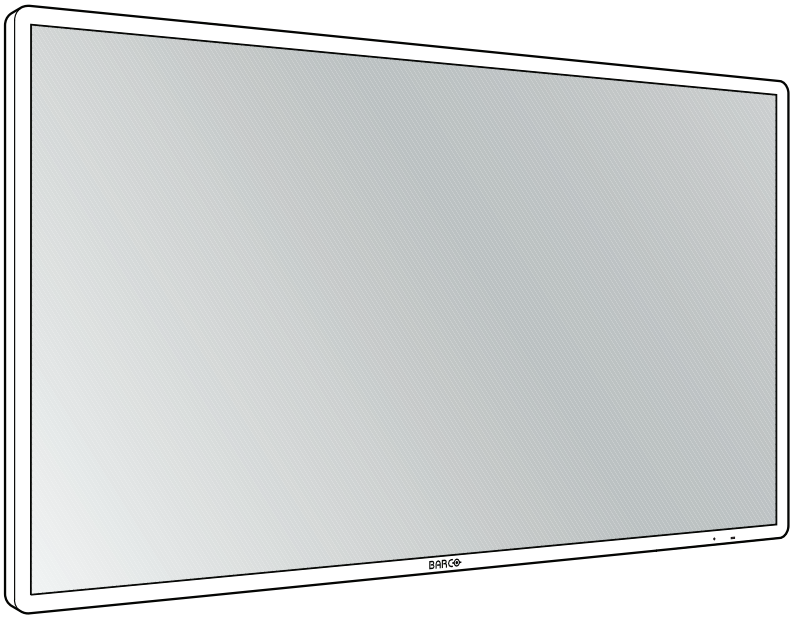
MDSC-8255

55” UHD 4K surgical display



User Guide

MDSC-8255 LED
MDSC-8255 MNA
MDSC-8255 12G

ENABLING BRIGHT OUTCOMES

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Table of contents

1 Welcome!

1.1 About the product

Overview

The 55” 4K Surgical Display is a wide screen LED surgical display that can support a maximum resolution of 4K-UHD (3840 x 2160). The display supports the following video inputs (depending on the specific version purchased): digital RGB (DVI), HDMI 1.4 and HDMI 2.0, DP 1.1, DP 1.2 MST, 3G-SDI, Quad-link SDI, 12G-SDI and Video-over-IP.

The 55” 4K Surgical Display is intended for video display during surgical procedures including arthroscopy (orthopedic surgery), laparoscopy (general and gynecological surgery), thoracoscopy, endoscopy (general, gastroenterological, and ENT surgery) and general surgery. The display is a non-sterile reusable device not intended for use in the sterile field. The display is intended for use by qualified physicians and qualified operating room personnel having complete knowledge of the surgical procedures being used.

Features

- 55-inch wide-screen LCD with UHD 4K resolution
- Wide viewing angle
- Wide color gamut and calibrated color spaces ITU709, DCI-P3 D65, BT. 2020
- High color depth with 10-bit per color
- Backlight Output Stabilization over time
- Advanced, full 10-bit image processing algorithms with 14-bit LUT
- UHD (3840x2160), FHD and legacy input accepted

Innovative features are available to give maximum flexibility when installing the display. The Failover Mode, for example, ensures a backup signal is always available for safe surgery.

1.2 What's in the box

Overview

- 1x MDSC-8255 display
- 1x DisplayPort cable (MDSC-8255 MNA and 12G)
- 2x DisplayPort cable (MDSC-8255 LED)
- 1x HDMI cable (only for MDSC-8255 LED and 12G)
- 1x SDI cable (only for MDSC-8255 12G)
- 1x printed User Guide (English)
- 1x documentation disc, containing all translations of the User Guide
- Mains cables
- Mounting screws and Allen key

The user guides are also available on *www.barco.com/support*

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

1.3 About this user guide

Overview

This manual provides support to the user during the installation, set up and utilization of the MDSC-8255 display. Depending on the specific version that has been purchased, some of the features and options described in this document may not apply to the display in user’s hands.

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.

Parts, controls and connectors

2

2.1 Front view

Overview

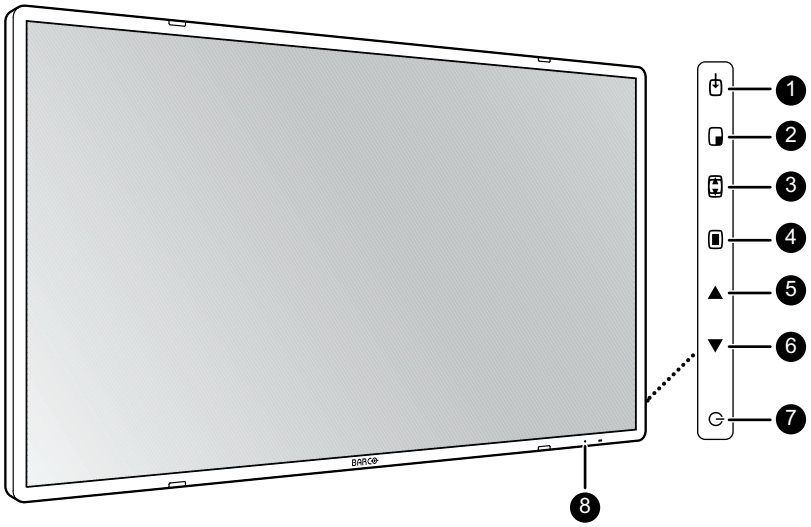


Image 2–1

A 7-key keypad is located on the right side of the display.

1. Input selection key
2. Down key
3. Up key
4. OSD menu key / Enter key
5. Brightness decrease / Left key
6. Brightness increase / Right key
7. Standby key
8. Power mode LED

2.2 Rear view

Overview

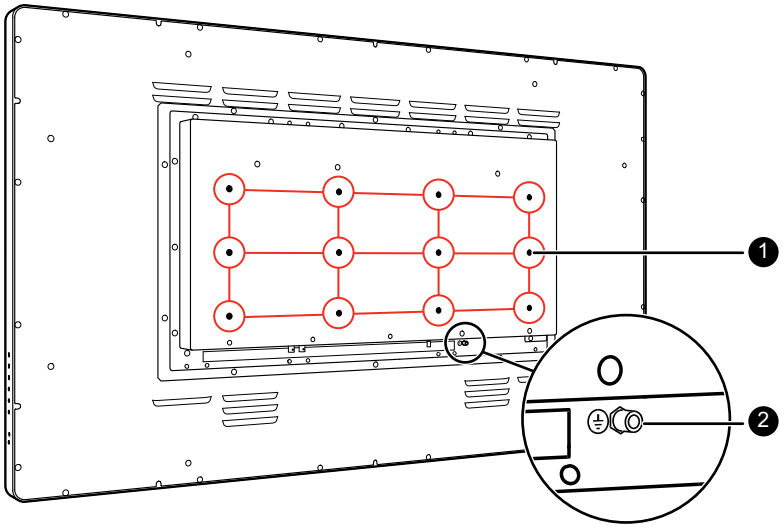


Image 2–2

1. VESA mount screw holes (VESA 200 mm and up)
2. Protective earth pin (for additional grounding)

2.3 Connector view

2.3.1 MDSC-8255 LED

Overview

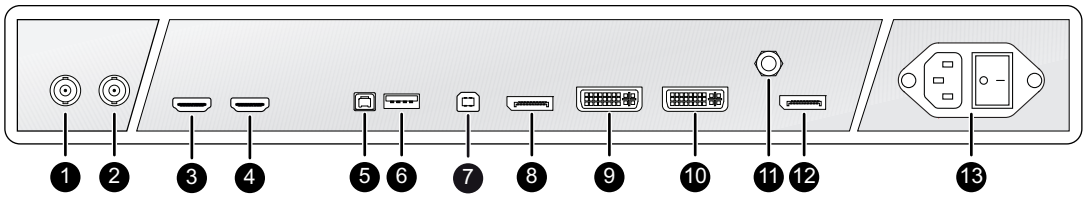


Image 2–3

1. SDI in
2. SDI out
3. HDMI2 2.0 in
4. HDMI1 2.0 in
5. +5 VDC – 2A power out (connector type: mating connector HIROSE RP34L-5PA- 2SC)
6. USB 2.0 type A interface
7. USB 2.0 micro-B interface
8. Main (Right) DisplayPort in
9. DVI-D in
10. DVI-D out
11. Potential Equalization pin (POAG)
12. 2nd (Left) DisplayPort in
13. 100-240 VAC (50-60 Hz) power in

The BNC SDI connectors match the characteristic impedance of 75 ohm cables.

2.3.2 MDSC-8255 MNA

Overview

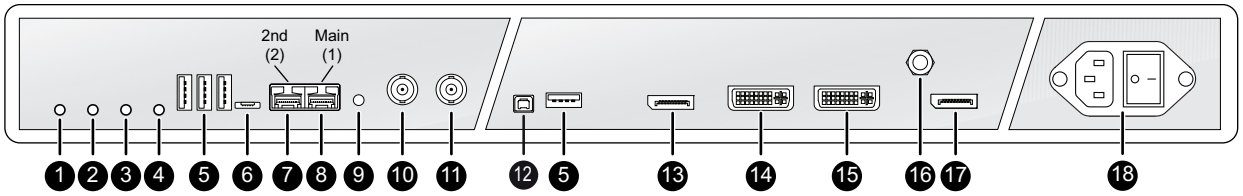


Image 2–4

1. Headphone out
2. Microphone in
3. Audio line out
4. Audio line in
5. USB 2.0 type A interface (4 x)
6. USB 2.0 micro-B interface (for service use only)
7. (2) Secondary SFP+ 10Gb optical Ethernet interface
8. (1) Main SFP+ 10Gb optical Ethernet interface
9. Identification button
10. SDI in
11. SDI out
12. +5 VDC – 2A power out (connector type: mating connector HIROSE RP34L-5PA- 2SC)
13. Main (Right) DisplayPort in
14. DVI-D in
15. DVI-D out
16. Potential Equalization pin (POAG)

17. 2nd (Left) DisplayPort in
18. 100-240 VAC (50-60 Hz) power in

Input and Output 1 to 9 are directly connected to the embedded Nexxis decoder.

The BNC SDI connectors match the characteristic impedance of 75 ohm cables.

2.3.3 MDSC-8255 12G

Overview

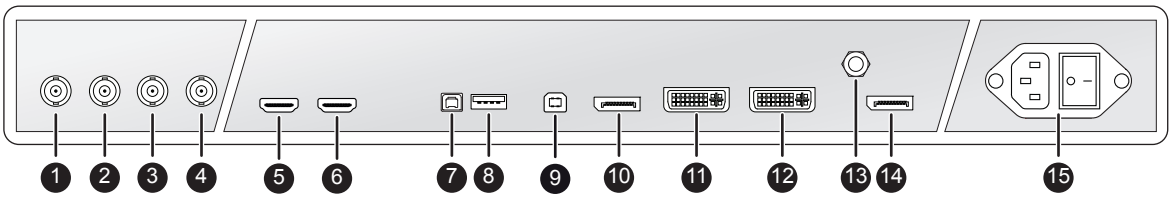


Image 2–5

1. SDI 1: Single link in or Quad link in top left (*)
2. SDI 2: Single link out or Quad link in top right (*)
3. SDI 3: Single link in or Quad link in bottom right (*)
4. SDI 4: Single link out or Quad link in bottom left (*)
5. HDMI 2 in
6. HDMI 1 in
7. +5 VDC – 2 A power out (connector type: mating connector HIROSE RP34L-5PA- 2SC)
8. USB 2.0 type A interface
9. USB 2.0 type B interface
10. Main (Right) DisplayPort in
11. DVI-D in
12. DVI-D out
13. Potential Equalization pin (POAG)
14. 2nd (Left) DisplayPort in
15. 100-240 VAC (50-60 Hz) power in

(*) See “SDI config (only for MDSC-8255 12G)”, page 40 about the possible SDI configuration modes.

The BNC SDI connectors match the characteristic impedance of 75 ohm cables.

2.4 Connector pin assignments

2.4.1 DVI connector (DVI-D)

Overview

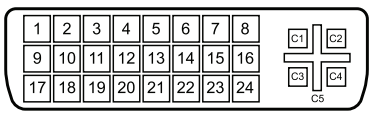


Image 2–6

1. D2_Rx- (T.M.D.S.)
2. D2_Rx+ (T.M.D.S.)
3. GND (data 2 shield)
4. Not connected
5. Not connected

6. SCL (for DDC)
7. SDA (for DDC)
8. Not connected
9. D1_Rx- (T.M.D.S.)
10. D1_Rx+ (T.M.D.S.)
11. GND (data 1 shield)
12. Not connected
13. Not connected
14. +5V output (*)
15. GND (cable sense)
16. Hot plug detect (*)
17. D0_Rx- (T.M.D.S.)
18. D0_Rx+ (T.M.D.S.)
19. GND (data 0 shield)
20. Not connected
21. Not connected
22. GND (clock shield)
23. CK_Rx+ (T.M.D.S.)
24. CK_Rx- (T.M.D.S.)

(*) +5 VDC output selectable on either pin 14 or 16 via the OSD menu. (+5V ± 10% @ 500mA (max))

2.4.2 USB type A connector

Overview

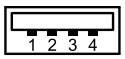


Image 2–7

1. +5 VDC
2. Data -
3. Data +
4. GND

2.4.3 USB type B connector

Overview

Image 2–8

1. Data -
2. +5 VDC
3. Data +
4. GND

2.4.4 Micro-USB connector

Overview

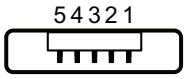


Image 2–9

1. +5 VDC
2. Data -
3. Data +
4. GND
5. Not connected

2.4.5 DisplayPort connector

Overview (sink side pin-out)

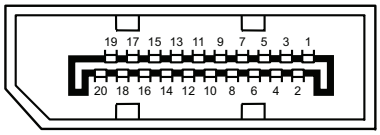


Image 2–10

1. ML_Lane 3 (n)
2. GND
3. ML_Lane 3 (p)
4. ML_Lane 2 (n)
5. GND
6. ML_Lane 2 (p)
7. ML_Lane 1 (n)
8. GND
9. ML_Lane 1 (p)
10. ML_Lane 0 (n)
11. GND
12. ML_Lane 0 (p)
13. CONFIG1
14. CONFIG2
15. AUX CH (p)
16. GND
17. AUX CH (n)
18. Hot Plug
19. Return
20. DP_PWR (+3.3 VDC @ 500 mA max)

2.4.6 HDMI connector

Overview

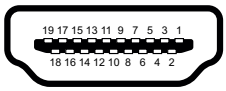


Image 2–11

1. T.M.D.S. Data2+
2. T.M.D.S. Data2 Shield
3. T.M.D.S. Data2-
4. T.M.D.S. Data1+
5. T.M.D.S. Data1 Shield
6. T.M.D.S. Data1-
7. T.M.D.S. Data0+
8. T.M.D.S. Data0 Shield
9. T.M.D.S. Data0-
10. T.M.D.S. Clock+
11. T.M.D.S. Clock Shield
12. T.M.D.S. Clock-
13. CEC
14. Not connected
15. DDC_SCL
16. DDC_SDA
17. DDC/CEC GND
18. +5VDC POWER
19. HDP

2.4.7 DC out connector

Overview

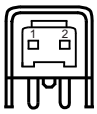


Image 2–12

1. +5 VDC
2. GND

Connector type: mating connector HIROSE RP34L-5PA- 2SC.

3 Installation

3.1 Interface connection

About

The MDSC-8255 can have multiple video inputs connected. Switching between the different inputs can be done easily with the Source shortkey ( ).

Futhermore, if more than one video source is connected, the Picture in Picture and Picture and Picture (PiP/PaP) functionalities become available, allowing you to view 2 different video inputs at once. Refer to "Picture and Picture input" and "Picture in Picture input" for more information.

Beside the video input connections, the MDSC-8255 also has video output capabilities allowing you to loop-through or duplicate the screen content on the DVI output port, allowing an easy connection with another display, projector, video recorder, ...

This chapter describes how to connect the different video interface types to the MDSC-8255.

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

Nexxis OR

Connecting your MDSC-8255 to Barco's Nexxis OR system allows you to distribute video, graphics, audio and computer data over the IP network, in raw uncompressed format, inside the operating room and even between surgical suites.

To connect your MDSC-8255 to Barco's Nexxis OR system, connect the 10Gb Ethernet interface to your Nexxis switch. More info about Nexxis OR and how to configure the MDSC-8255 in your network is available in the dedicated user guides. Please visit *www.barco.com* to obtain these user guides.

Nexxis OR is only available on the MDSC-8255 MNA version.

3.1.1 MDSC-8255 LED

To connect the interfaces

1. Connect one or more video source(s) to the corresponding video inputs of the display. For a list of supported video inputs and timings, see "Technical specifications", page 64.
2. When the SDI video input is connected, an additional SDI video sink can be connected to the SDI output (= SDI input loop-through).
3. Screen image clone: The entire active image on the screen (including OSD) can be duplicated to a FHD (1080p/1080i) signal on the DVI output connector, to which an additional DVI video sink can be connected.
4. Connect the micro-USB interface with a workstation to use the remote control protocol, to update the display firmware, or to be able to connect any USB peripheral with the USB interfaces of the display.
5. Use any USB peripheral (keyboard, mouse, webcam, ...) by connecting it to the USB interface (a host PC connected to micro USB-port is required).
6. Connector +5 VDC - 2A power out for accessory (Mating connector HIROSE RP34L-5PA- 2SC(1857) (71)).

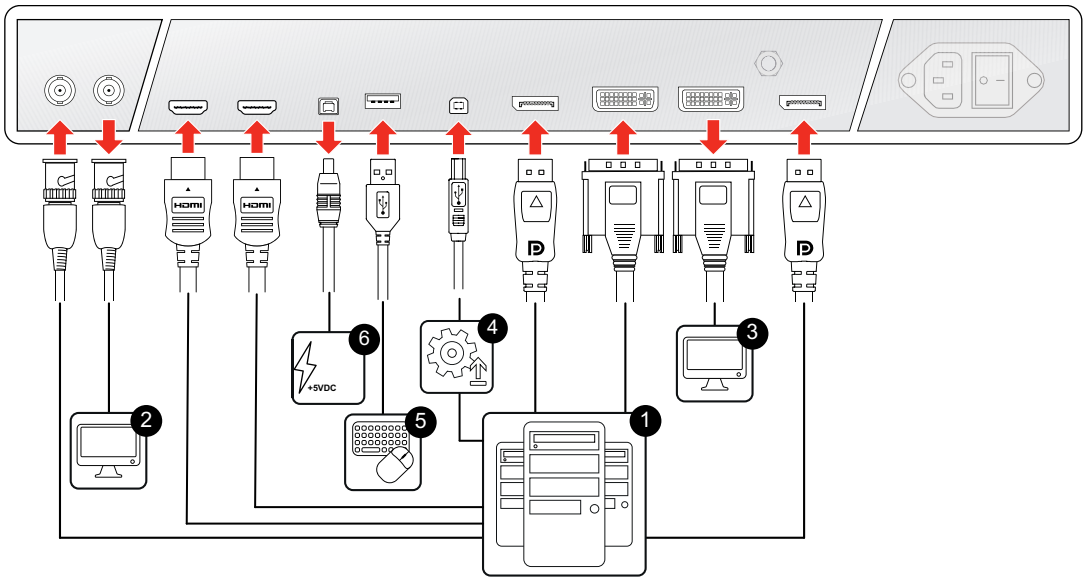


Image 3–1

DisplayPort VESA DP 1.2 certified cables for 5.4 Gbps HBR2 with a length of up to 3 m are recommended.

Premium certified HDMI 2.0 cables with a length of up to 3 m are recommended.

3G-SDI Belden 1694A cables with a length of up to 50 m and 12G-SDI Belden 4855R cables with a length of up to 30 m are recommended.

The DVI output must be enabled in the OSD menu (please refer to “DVI output”, page 48).

A subset of the commands of the remote control protocol is also available on a new DDC protocol on DVI and DisplayPort1 auxiliary channel.

3.1.2 MDSC-8255 MNA

To connect the interfaces

1. Connect one or more video source(s) to the corresponding video inputs of the display. For a list of supported video inputs and timings, see “Technical specifications”, page 64.
2. When the SDI video input is connected, an additional SDI video sink can be connected to the SDI output (= SDI input loop-through).
3. Screen image clone: The entire active image on the screen (including OSD) can be duplicated to a FHD (1080p/1080i) signal on the DVI output connector, to which an additional DVI video sink can be connected.
4. Use any USB peripheral (keyboard, mouse, webcam, ...) by connecting it to the available USB interfaces.
5. Connector +5 VDC - 2A power out for accessory (Mating connector HIROSE RP34L-5PA- 2SC(1857)(71))
6. Connect a headphone to the appropriate output to listen to audio sent over Nexxis.
7. Connect a microphone to the appropriate input to send spoken audio over Nexxis.
8. Connect a (set of) speaker(s) to the line out interface to listen to audio sent over Nexxis.
9. Connect any kind audio player to the line in interface to send audio over Nexxis.
10. Connect the display with Nexxis to use the remote control protocol or to update the display firmware.

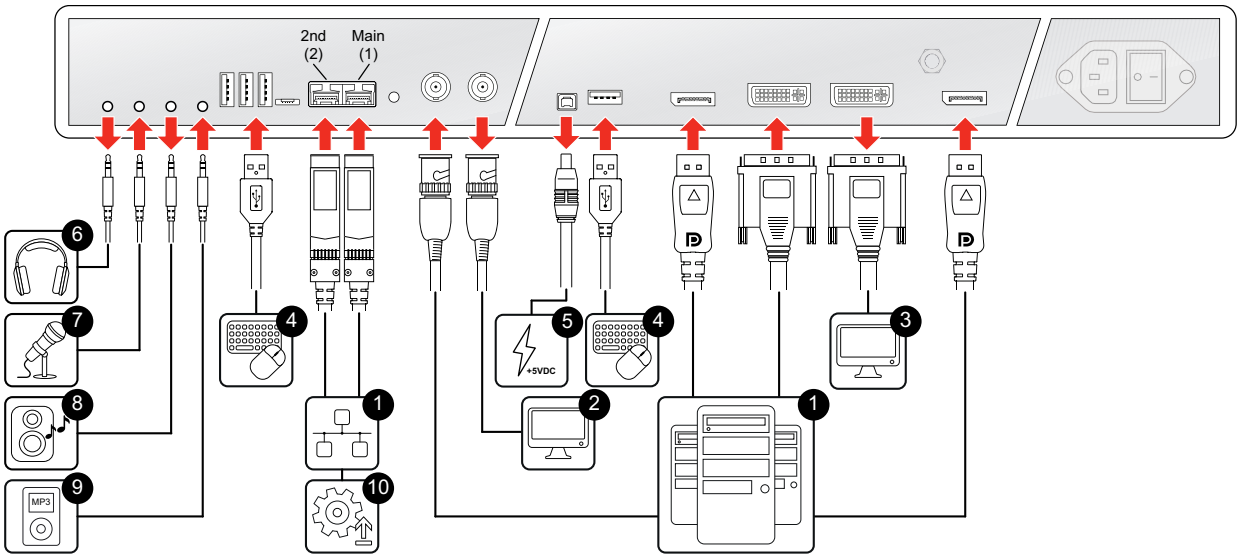


Image 3–2

DisplayPort VESA DP 1.2 certified cables for 5.4 Gbps HBR2 with a length of up to 2 m are recommended.

Premium certified HDMI 2.0 cables with a length of up to 3 m are recommended.

3G-SDI Belden 1694A cables with a length of up to 50 m and 12G-SDI Belden 4855R cables with a length of up to 30 m are recommended.

The DVI output must be enabled in the OSD menu (please refer to “DVI output”, page 48).

A subset of the commands of the remote control protocol is also available on a new DDC protocol on DVI and DisplayPort1 auxiliary channel.

3.1.3 MDSC-8255 12G

To connect the interfaces

1. Connect one or more video source(s) to the corresponding video inputs of the display. For a list of supported video inputs, see “Technical specifications”, page 64. See “SDI config (only for MDSC-8255 12G)”, page 40 about the possible SDI configuration modes.
2. Screen image clone: The entire active image on the screen (including OSD) can be duplicated to a FHD (1080p/1080i) signal on the DVI output connector, to which an additional DVI video sink can be connected.
3. Connect the USB2.0 type B interface with a workstation to use the remote control protocol, to update the display firmware, or to be able to connect any USB peripheral with the USB interfaces of the display.
4. Use any USB peripheral (keyboard, mouse, webcam, ...) by connecting it to the available USB interface(s).
5. Connector +5 VDC - 2A power out for accessory (Mating connector HIROSE RP34L-5PA- 2SC(1857)(71)).

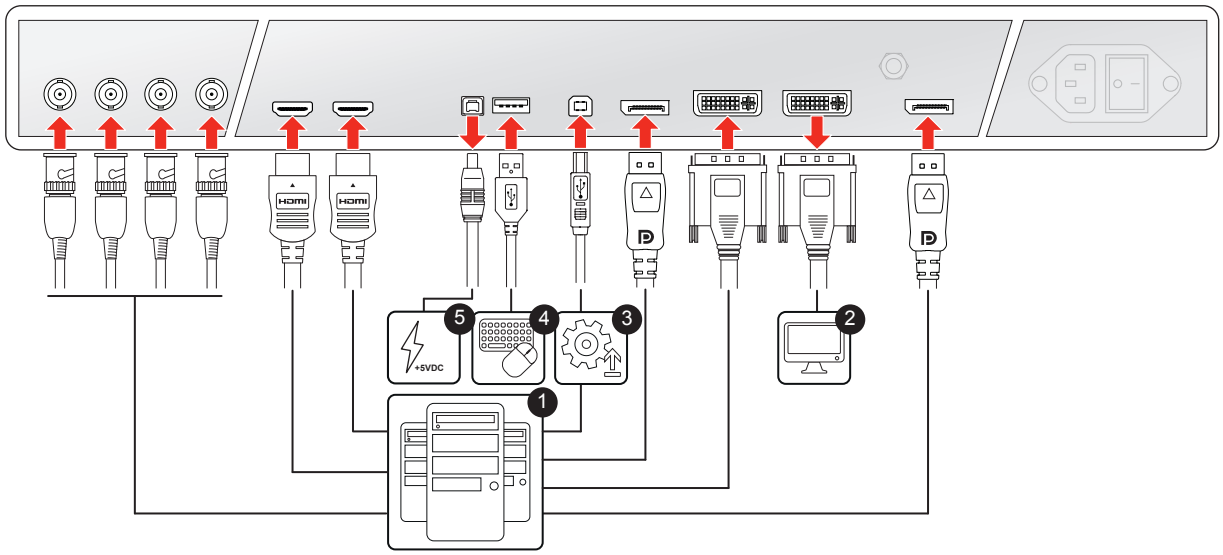


Image 3–3

DisplayPort VESA DP 1.2 certified cables for 5.4 Gbps HBR2 with a length of up to 2 m are recommended.

Premium certified HDMI 2.0 cables with a length of up to 3 m are recommended.

3G-SDI Belden 1694A cables with a length of up to 50 m and 12G-SDI Belden 4855R cables with a length of up to 30 m are recommended.

The DVI output must be enabled in the OSD menu (please refer to “DVI output”, page 48).

A subset of the commands of the remote control protocol is also available on a new DDC protocol on DVI and DisplayPort1 auxiliary channel.

3.2 Power connection

To connect the power

Connect the power input of your display with a **grounded** power outlet by means of the proper power cord delivered with your display.

Image 3–4

CAUTION: The display must be earthed.

Potential equalization

When potential equalization between the display and other devices is required then connect the potential equalization pin (POAG) to the potential equalization terminal of the equipment.

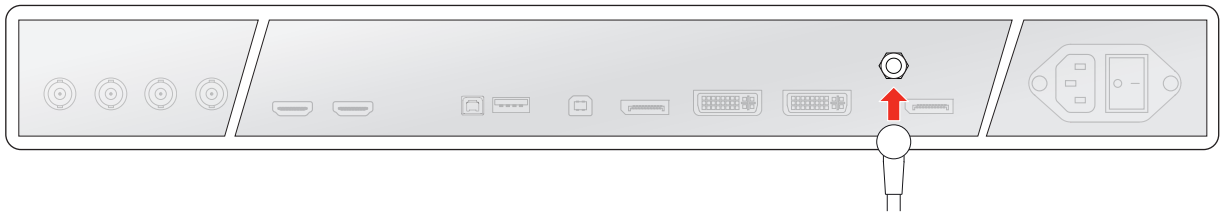


Image 3–5

Additional protective earth

For additional grounding, earth the display by connecting the protective earth pin to a grounded outlet by means of a wire with at minimum AWG18 size (according to national Regulation requirements regarding maximum admitted cable length). Use the included M4 screw to attach the wire to the protective earth pin.

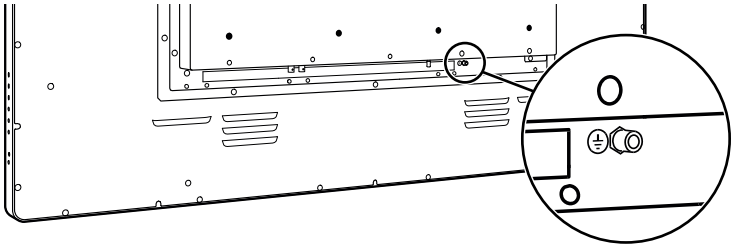


Image 3–6

3.3 VESA mount installation

To install the display on a VESA mounting solution

The display can be attached to a VESA 200 mm or VESA 600 mm arm or stand.

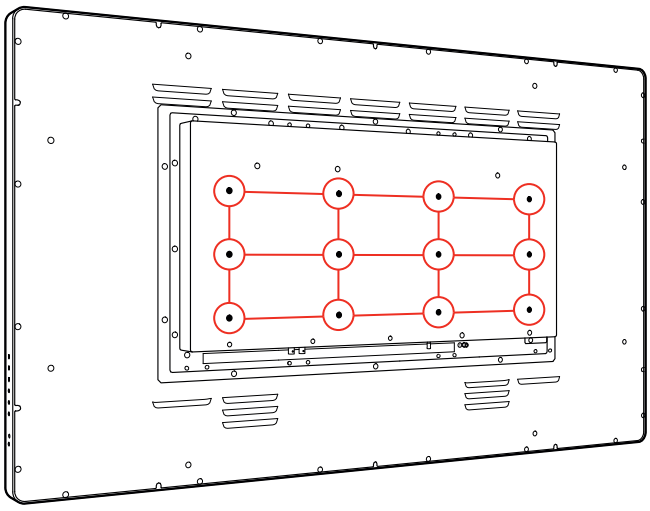


Image 3–7

The VESA mounting holes at the back of the display are provided with M6-type blind fasteners to fix the VESA mounting plate. Depending on the VESA plate thickness (T) and the thickness of possible washers (W), a different screw length (L) should be selected.

Please respect the following rule to select an appropriate screw length:

- L_{min} = T + W + 8 mm
- L_{max} = T + W + 11 mm

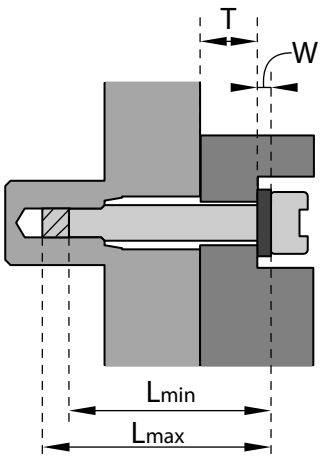


Image 3–8

CAUTION: Tighten the screws with a torque of **3 Nm** when fixing the VESA mounting plate.

CAUTION: Use an arm that is in compliance with VESA requirements.

CAUTION: The monitor VESA interface has been designed for a safety factor 6 (to support 6 times the monitor weight). In the medical system, use an arm with suitable safety factor (IEC60601–1).

4 Daily operation

4.1 On/Off switching

To switch on/off your display:

1. Power on/off your display using the mains switch located on the back of the display.

While your display is on, press and hold the stand-by key for approximately 1 second to put the display in the stand-by mode.

While your display is in stand-by mode, press and hold the stand-by key for approximately 1 second to activate the display.

4.2 Power mode LED

About the power mode LED

The behavior of the power LED shows the status of the unit:

- **Off:** Hard power OFF (power unplugged or switched off through rocker switch)
- **Amber slow blinking:** Soft power OFF (switched off by using the stand-by key (⏻))
- **Full amber:** Display is in power save mode (backlight and LCD off)
- **Green/amber blinking:** Searching for signal
  Note: When Power save mode is enabled, the display will automatically go into power save mode after 10 seconds of searching without signal.
- **Full green:** Display has a valid input signal.

4.3 OSD menu activation

To activate the OSD menu

Press the ▭ key on the display.

As a result, the OSD main menu comes up in the bottom right corner of the screen. If no further actions are taken within the following 30 seconds, the OSD menu will disappear again.

If after pressing the ▭ key, the *OSD lock* window appears then this means that the OSD lock has been enabled. Refer to “Control lock”, page 47 for more information and instructions to unlock the OSD menu.

The time-out of the OSD menu automatic close function can be adjusted or disabled in the OSD menu (*OSD Time-out*).

The OSD menu position can be adjusted in the OSD menu (*OSD Hor. Pos.* and *OSD Vert. Pos.*).

4.4 OSD menu navigation

OSD menu structure explained

Below is an example of the OSD menu structure:

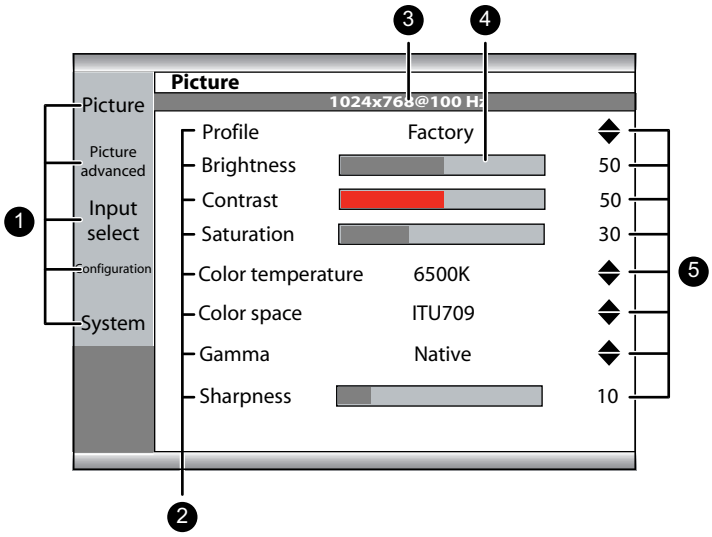


Image 4–1

1. Menu pages
2. Sub-menus (menu items)
3. Status bar
4. Selector/Slider
5. Item

Grayed out menu items are not available on the specific display version.

To navigate through the OSD menu

Image 4–2

- Press the ▣ key to open the OSD menu.
- Use the ◔ or ⇔ key to scroll to the desired menu page.
- When the desired Menu page is highlighted, press the ▶ key to select the top menu item that will be highlighted.
- Use the ◔ or ⇔ keys to move to other Menu Items, then press the ▶ key to select it.
- If the selected menu item is controlled by a slider use the ◀ or ▶ keys to adjust the item value, then press the ▣ key to confirm.
- If the selected menu item is a multiple choices menu use the ◔ or ⇔ keys to select the desired option then press the ▣ key to confirm.
- Press again ◔ or ⇔ key to select other Menu items or exit from the Menu page by pressing the ▣ key.

4.5 Shortkey functions

About shortkey functions

The concept of shortkey functions is to present a selection of commonly used functions immediately available without the need to navigate through the OSD menu.

The different available shortkey functions are:

- Main source selection
- Brightness adjustment

Overview of shortkeys

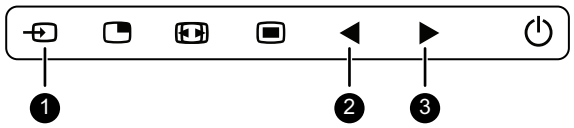


Image 4–3

1. Main source selection
2. Brightness decrease
3. Brightness increase

4.5.1 Main source selection

To quickly select the main source

Press the ⊷ key to scroll through all the possible input signals and quickly select the main source.

Available main source options may differ depending on display model.

To avoid unwanted or accidental activation of any function through the keyboard all keys,except the Power On/Off, can be locked using a dedicated OSD Menu function (see “Control lock”, page 47).

4.5.2 Brightness adjustment

To quickly adjust the brightness

While no OSD menu is on the screen, press the ◀ or ▶ key to adjust the brightness as desired.

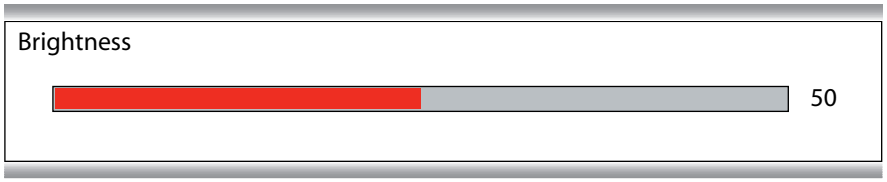


Image 4–4

4.6 Control lock: OSD menu locking/unlocking

About the control lock

As described in “Control lock”, page 47, the control lock can be enabled to avoid unwanted access. When the OSD is locked, pressing the ▭ key after unlocking the keyboard will not activate the OSD menu, but will make the *OSD lock* window appear. The OSD menu can only be accessed after pressing a sequence of keys.

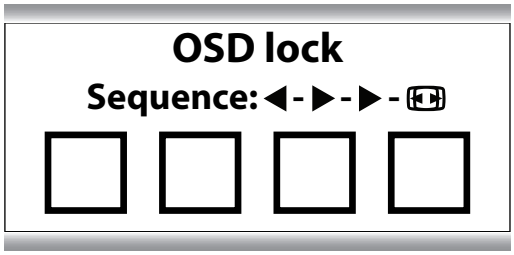


Image 4–5

To lock/unlock the menu

When the *OSD lock* window appears, press the following key sequence to unlock the OSD menu:

◀, ▶, ▶, ⊡

Each time a key is pressed an asterisk is shown in the square boxes.

After pressing the fourth key, if the sequence is correct, the OSD main menu is activated. After exit, the OSD menu will automatically lock again.

5 Advanced operation

Not all features described in the chapter “Advanced operation” are available. The features not available in specific software versions are grayed out in the OSD menu.

5.1 Picture menu

5.1.1 Profile

About profiles

To select a profile means to load a set of predefined video parameters like Brightness, Contrast, Saturation, Input selection (Primary & Secondary), Multi-image layout selection, etc.

The user can modify the default video parameters associated to each profile and save the new parameters setting under the User 1, User 2 or User 3 profile. The Factory and X Ray profiles can be temporarily modified, but the factory default can't be overwritten and can always be recalled through the recall profile menu item.

The available profiles for your display are:

- Factory
- X Ray: By selecting this profile, *Gamma* and *Color temperature* will be automatically set to *DICOM* and *Native* respectively
- User 1
- User 2
- User 3

To select a profile

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Profile* submenu.
4. Select one of the available profiles and confirm.

5.1.2 Brightness

To adjust the brightness level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Brightness* submenu.
   The command bar *Brightness* is highlighted.
4. Set the brightness level as desired and confirm.

The selected brightness is maintained at a constant level by the automatic backlight stabilization function.

The brightness level can also be adjusted through a shortkey function.

Brightness level is adjusted by controlling the backlight illumination only.

5.1.3 Contrast

To adjust the contrast level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Contrast* submenu.
   The command bar *Contrast* is highlighted.
4. Set the contrast level as desired and confirm.

5.1.4 Saturation

To adjust the saturation level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Saturation* submenu.
   The command bar *Saturation* is highlighted.
4. Set the saturation level as desired and confirm.

5.1.5 Color temperature

About color temperature presets

The available color temperature presets for your display are:

- 5600K
- 6500K
- 7600K
- 9300K
- Native
- User

Factory calibration – White point:
The White Color points associated with the Color Temperature: 5600K, 6500K, 7600K or 9300K are factory calibrated with a consequent reduction of the maximum luminance compared to Native Color Temperature.

Only in case the User preset has been selected it is possible to get access to the color regulation commands to adjust the gain and offset of red, green and blue primary colors.

To select a color temperature preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Color Temperature* submenu.
4. Select one of the available color temperature presets and confirm.

If you selected the User color temperature preset, a new menu will be displayed allowing you to manually adjust the gain and offset of red, green and blue.

5.1.6 Color space

About color space presets

The available color space presets for your display are:

- Native (LCD primaries uncalibrated)
- ITU709
- BT.2020 (*)
- DCI-P3 D65

(*) BT.2020 reproducible colors are within the limit of the LCD panel color gamut.

Factory calibration – Color space:
RGB primary calibration, according to the selected standard, is performed within the physical limitation of the LCD panel used.

To select a color space preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.

3. Enter the *Color Space* submenu.
4. Select one of the available color space presets and confirm.

5.1.7 Gamma

About gamma presets

The available gamma presets for your display are:

- 1.8
- 2.2
- 2.4
- Video (transfer function adapted for video cameras with dark levels enhancement)
- Native (no correction curve is applied)
- DICOM (grayscale levels are following closely the DICOM curve – for reference only, not for diagnostic purposes)

To select a gamma preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Gamma* submenu.
4. Select one of the available gamma presets and confirm.

5.1.8 Sharpness

About sharpness level

This command allows to smoothen or sharpen the image. Following values apply:

- < 12: Smoothen image
- = 12: Neutral image (default)
- > 12: Sharpen image

To adjust the sharpness level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Sharpness* submenu.
   The command bar *Sharpness* is highlighted.
4. Set the sharpness level as desired and confirm.

Sharpness control is not available when DisplayPort mode *DP 1.1 dual* is selected (see “DisplayPort mode”, page 39).

5.2 Picture advanced menu

5.2.1 Black Level

About black level

This command allows to add or subtract an offset to the input video signal (available only on video formats).

To adjust the black level

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Black Level* submenu.
   The command bar *Black Level* is highlighted.
4. Set the black level as desired and confirm.

5.2.2 Latency

About latency

The video latency is defined as the delay between the time of a monitor input video transition to the corresponding light output transition on screen.

The available latency modes for your display are:

- Diagnostic: Best picture quality (with enhanced noise reduction filter)
- Surgical: Lowest latency, optimized for fast moving images

To select the latency mode

1. Bring up the OSD main menu.
2. Navigate to the *Picture Advanced* menu.
3. Enter the *Latency* submenu.
4. Select one of the available latency modes and confirm.

5.2.3 Input range

About input range

This command sets the signal range of the inputs. Suggest to set the input range according to the input signal range.

The available input ranges are:

- 0–255
- 16–235
- 16–255
- AUTO

The input range control “AUTO” is available only when the selected main source (see “Main source selection”, page 30) is different from DVI or SDI.

To select the input range

1. Bring up the OSD main menu.
2. Navigate to the *Picture Advanced* menu.
3. Enter the *Input range* submenu.
4. Select one of the available input ranges and confirm.

5.2.4 Input color format

About input color format

This command sets the signal color format of the inputs. Suggest to set the input color format according to the input signal (“AUTO” setting will follow the input metadata).

The available input color formats are:

- YUV 4:4:4
- YUV 4:4:2
- RGB
- AUTO

The input color format command is available only when the selected main source (see “Main source selection”, page 30) isDP or SDI 4K.

To select input color format

1. Bring up the OSD main menu.
2. Navigate to the *Picture Advanced* menu.

3. Enter the *Input color format* submenu.
4. Select one of the available input color formats and confirm.

5.2.5 YUV color matrix

About YUV color matrix

When YCbCr input format is selected/detected, a programmable color matrix for YUV to RGB conversion is available. A manual selection is available to match the color encoding used at the transmitter side (“AUTO” setting will follow the input metadata information).

The available color matrix presets are:

- BT.2020
- BT.709
- BT.601
- AUTO

To select a YUV color matrix preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture Advanced* menu.
3. Enter the *YUV color matrix* submenu.
4. Select one of the available YUV color matrix preset and confirm.

5.2.6 Image size

About image size

The available image sizes for your display are:

- Aspect (fill the screen on largest dimension, no modification in image aspect-ratio)
- Native (input pixel to LCD pixel mapping, no scaling)

In both Aspect and Native, the image may be displayed with black bars on top/bottom or left/right.

To select the image size

1. Bring up the OSD main menu.
2. Navigate to the *Picture Advanced* menu.
3. Enter the *Image Size* submenu.
4. Select one of the available image sizes and confirm.

5.2.7 Image flip

About image flip

This function allows you to flip the image on your display.

The available options are:

- Disabled (no image flip applied)
- Mirror (flips the image horizontally, making the left content appear on the right and vice versa)
- Rotation (rotates the image 180° = Hor + Ver flip)

When image rotation is selected, the latency will increase with 20 msec. Image mirroring does not cause any latency increase.

To enable/disable horizontal flip

1. Bring up the OSD main menu.
2. Navigate to the *Picture Advanced* menu.

3. Enter the *Image Flip* submenu.
4. Select one of the available options and confirm.

5.3 Input select menu

5.3.1 Main Source

About main sources

The available main sources for your display are:

- DVI
- SDI 4K (MDSC-8255 12G only)
- SDI
- DisplayPort
- HDMI–1 (MDSC-8255 LED/12G only)
- HDMI–2 (MDSC-8255 LED/12G only)
- Nexxis (MDSC-8255 MNA only)

Available main source options may differ depending on display model.

The main source can also be quickly selected through the Input selection key (), without the need to navigate through the OSD menu.

To select the main source

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *Main Source* submenu.
4. Select one of the available main sources and confirm.

5.3.2 DisplayPort mode

About DisplayPort mode

The available DisplayPort (DP) modes for your display are:

- DP 1.2 MST L:R (MST stream 1 on Left side/ MST stream 2 on Right side)
- DP 1.2 MST R:L (MST stream 1 on Right side/ MST stream 2 on Left side)
- DP 1.1 main
- DP 1.1 dual

Please refer to the technical specifications for an overview of accepted video formats.

To select the DisplayPort mode

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *DP mode* submenu.
4. Select one of the available DisplayPort modes and confirm.

5.3.3 4K SDI mode (only for MDSC-8255 12G)

About 4K SDI mode

The available 4K SDI modes for your display are:

- Square-division (SQD)

- 2-sample interleave (2SI)
- Auto (*)

(*) Select Auto only when the SDI mode is present in the SDI video payload identifier.

To select the 4K SDI mode

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *4K SDI mode* submenu.
4. Select one of the available 4K SDI modes and confirm.

5.3.4 SDI config (only for MDSC-8255 12G)

About SDI config

The available SDI config modes for your display are:

- Quad-SDI (Quad link 3G-SDI)
- Dual SDI (Dual input: SDI 1 up to 12G-SDI, SDI 3 up to 3G-SDI)
- Single SDI-1 (up to 12G-SDI)
- Single SDI-3 (up to 12G-SDI)

To select the SDI config mode

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *SDI config* submenu.
4. Select one of the available SDI config modes and confirm.

SDI loopthrough (not available in Quad link)
SDI 2: loopthrough of SDI 1
SDI 4: loopthrough of SDI 3

5.3.5 Auto search

About auto search

By enabling the input selection auto search function, the display will automatically detect the connected source and display it on the screen.

To enable/disable auto search

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *Auto search* submenu.
4. Enable/Disable auto search as desired and confirm.

5.3.6 Failover input (MDSC-8255 LED & MNA)

About failover input

This function allows the display to automatically switch to a failover (backup) source in case the main source (DisplayPort, HDMI, Nexxis) is missing. The display will automatically restore the main source once the signal is back.

The available failover inputs for your display are:

- None
- DVI
- SDI

The failover input can only be selected when both
1. the *Auto search* function is disabled (see “Auto search”, page 40), and
2. the *PiP/PaP Modes* function is disabled (see "Picture and Picture input” and “Picture in Picture input”).
If any of both functions are enabled then failover will be disabled and made unavailable. As soon as both functions are disabled again, failover will be enabled and made available again with the selected failover input.

The failover input will be activated within about 7 seconds after the main source has been lost.

During the transition from main to failover input and vice versa, a text message is visible to inform the user.

The main source can be changed while the failover input remains unchanged. During the selection and synchronization of a new main source the failover function is temporary (7 sec) disabled.

To select failover input

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *Failover Input* submenu.
4. Select one of the available failover inputs and confirm.

5.3.7 Failover input (MDSC-8255 12G)

About failover input

This function allows the display to automatically switch to a failover (backup) source in case the main source (DisplayPort, HDMI, SDI 4K) is missing. The display will automatically restore the main source once the signal is back.

The available failover inputs for your display depend on the selected SDI configuration mode. See the following table for more details.

Main source	Backup source
DP / HDMI / SDI 1	• None • DVI • SDI 3 (*1)
DP / HDMI / SDI 1 / SDI 3 (*2)	• None • DVI
DP / HDMI / QUAD LINK 3G-SDI (*3)	• None • DVI

The failover input can only be selected when both
1. the *Auto search* function is disabled (see “Auto search”, page 40), and
2. the *PiP/PaP Modes* function is disabled (see "Picture and Picture input” and “Picture in Picture input”).
If any of both functions are enabled then failover will be disabled and made unavailable. As soon as both functions are disabled again, failover will be enabled and made available again with the selected failover input.

The failover input will be activated within about 7 seconds after the main source has been lost.

During the transition from main to failover input and vice versa, a text message is visible to inform the user.

The main source can be changed while the failover input remains unchanged. During the selection and synchronization of a new main source the failover function is temporary (7 sec) disabled.

(*1) SDI 3 is only available if the SDI configuration is Dual SDI.
(*2) The SDI configuration is Single SDI-1 / Single SDI-3.
(*3) The SDI configuration is Quad-SDI.

To select failover input

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *Failover Input* submenu.
4. Select one of the available failover inputs and confirm.

5.3.8 Picture and Picture input (MDSC-8255 LED & MNA)

About Picture and Picture input

This function allows the display to show a second input source on the left side of the display. The Primary input (main source) is still displayed on the right half of the screen.

The possible Picture and Picture combinations between the Primary input (main source) and the Secondary input (PaP image) is displayed in the following table.

Primary input	Secondary input
DP 1.1	• HDMI 2.0–1 • HDMI 2.0–2 • DVI • SDI
HDMI 2.0–1 HDMI 2.0–2	• DP 1.1 • DVI • SDI
DVI SDI	• DP 1.1 • HDMI 2.0–1 • HDMI 2.0–2

Both primary and secondary input are limited to FHD resolution max.

The Video Parameters applied to the Primary input Source are also applied to the Secondary input.

The 2nd source keeps the same image size (Native/Aspect) as the Primary input Source.

To select Picture and Picture input

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *PaP Input* submenu.
4. Select one of the available PaP sources (or NONE) and confirm.

5.3.9 Picture and Picture input (MDSC-8255 12G)

About Picture and Picture input

This function allows the display to show a second input source on the left side of the display. The Primary input (main source) is still displayed on the right half of the screen.

The possible Picture and Picture combinations between the Primary input (main source) and the Secondary input (PaP image) is displayed in the following table.

Primary input	Secondary input
DP 1.1	• HDMI 2.0–1 • HDMI 2.0–2 • DVI • SDI 3 (*)
HDMI 2.0–1 HDMI 2.0–2	• DP 1.1 • DVI • SDI 3 (*)
DVI SDI 3 (*)	• DP 1.1 • HDMI 2.0–1 • HDMI 2.0–2

Both primary and secondary input are limited to FHD resolution max.

The Video Parameters applied to the Primary input Source are also applied to the Secondary input.

The 2nd source keeps the same image size (Native/Aspect) as the Primary input Source.

(*) SDI 3 is only available if the SDI configuration mode is Dual SDI.

To select Picture and Picture input

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *PaP Input* submenu.
4. Select one of the available PaP sources (or NONE) and confirm.

5.3.10 Picture in Picture input (MDSC-8255 LED & MNA)

About Picture in Picture input

This function allows the display to show a second input source as an inset window inside the main source.

The possible Picture in Picture combinations between the Primary input (main source) and the Secondary input (PiP image) is displayed in the following table.

Primary input	Secondary input
DP 1.2 MST / 1.1 / Dual HDMI 2.0–1 HDMI 2.0–2	• DVI • SDI

Gamma and Color temperature for the PiP Source are always set to Native and 6500 K independently from the Transfer Function applied to the Primary input Source.

To select Picture in Picture input

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *PiP Input* submenu.
4. Select one of the available PiP inputs (or NONE) and confirm.

5.3.11 Picture in Picture input (MDSC-8255 12G)

About Picture in Picture input

This function allows the display to show a second input source as an inset window inside the main source.

The possible Picture in Picture combinations between the Primary input (main source) and the Secondary input (PiP image) is displayed in the following table.

Primary input	Secondary input
DP 1.2 MST / 1.1 / Dual HDMI 2.0–1 HDMI 2.0–2 12G-SDI (on SDI 1)	DVI SDI 3 (*)

Gamma and Color temperature for the PiP Source are always set to Native and 6500 K independently from the Transfer Function applied to the Primary input Source.

(*) SDI 3 is only available if the SDI configuration mode is Dual SDI.

To select Picture in Picture input

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *PiP Input* submenu.
4. Select one of the available PiP inputs (or NONE) and confirm.

5.3.12 Picture in Picture mode

About Picture in Picture mode

The available Picture in Picture modes for your display are:

- Large PiP: 35% of display horizontal size in top or bottom of right corners
- Small PiP: 25% of display horizontal size in top or bottom of right corners

To select Picture in Picture mode

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *Picture in Picture Mode* submenu.
4. Select one of the available Picture in Picture modes and confirm.

5.3.13 Picture in Picture position

About Picture in Picture position

The available Picture in Picture positions for your display are:

- Bottom right
- Top right

To select Picture in Picture position

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *PiP Position* submenu.
4. Select one of the available PiP positions and confirm.

5.3.14 Picture in Picture transparency

About Picture in Picture transparency

The available Picture in Picture transparencies range selectable for your display is between:

- 0: No transparency
- 10: Maximum transparency (roughly 37%)

To select Picture in Picture mode

1. Bring up the OSD main menu.
2. Navigate to the *Input Select* menu.
3. Enter the *PiP transparency* submenu.
4. Select one of the required PiP transparency value and confirm.

5.4 Configuration menu

5.4.1 Information

About information

The available information items for your display are:

- Model (commercial type identification)
- SW package (display firmware identification)
- Main board release (hardware and firmware identification)
- MNA release (firmware identification) (MNA only)
- Eth1 Main (IP address of Main ethernet (1) port of the monitor) (MNA only)
- Eth2 2nd (IP address of 2nd ethernet (2) port of the monitor) (MNA only)
- Keyboard release (hardware and firmware identification)
- SDI module release (hardware and firmware identification)
- Serial Number (unit serial number)
- Main FPGA release (firmware identification)

To access information

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Information* submenu.

5.4.2 Language

About languages

The OSD menu of your display is available in multiple languages.

To select the language

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Language* submenu.
4. Select one of the available languages and confirm.

5.4.3 OSD time-out

About OSD time-out

The OSD menu can automatically close after a certain time of inactivity after the last selection was made.

The available OSD time-out values for your display are:

- 10 Sec.
- 20 Sec.
- 30 Sec.
- 60 Sec.
- Disabled (=5 minutes)

To adjust the OSD time-out

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *OSD setting* submenu.
4. Select *OSD Time-out*
5. Select one of the available OSD time-out values and confirm.

5.4.4 Recall Profile

About recalling profiles

To recall a profile means to restore the default factory settings (Factory and X Ray profiles) or recall the user defined profiles.

The available profiles to recall from your display are:

- Factory
- X Ray
- User 1
- User 2
- User 3

To recall a profile

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Recall Profile* submenu.
4. Select one of the available profiles to recall and confirm.

5.4.5 Save Profile

About saving profiles

The user can modify the default video parameters associated to each profile and save the new parameter settings under the User 1, User 2 or User 3 profile. The Factory and X Ray profiles can be modified, but the factory default can’t be overwritten and can always be recalled through the recall profile menu item.

The available profiles to save in your display are:

- User 1
- User 2
- User 3

To save a profile

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Save Profile* submenu.
4. Select one of the available profiles to save and confirm.

5.5 System menu

5.5.1 Power on DVI

About power on DVI

This setting allows you to select the pin of the DVI connector on which the +5V DC supply is applied.

The available options are:

- Disabled
- +5V on Pin 14
- +5V on Pin 16

To select the power on DVI

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Power on DVI* submenu.
4. Select one of the available options and confirm.

5.5.2 Power on DisplayPort

About power on DisplayPort

This setting allows you to select if the +3V3 DC supply is applied on the DisplayPort connector or not.

The available options are:

- Disabled
- +3V3 on DP main

To select the power on DisplayPort

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Power on DP* submenu.
4. Select one of the available options and confirm.

5.5.3 Control lock

About control locking

This setting allows you to avoid unwanted activation of any function through the keyboard. By enabling the Control lock function, the front keyboard can only be accessed after pressing a sequence of keys. Refer to “Control lock: OSD menu locking/unlocking”, page 30.

To enable/disable control locking

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Control Lock* submenu.
4. Enable/Disable Control locking as desired and confirm.

5.5.4 Power saving

About power saving

When the selected input(s) is (are) missing (main, 2nd and failover), this setting allows the display to switch off the backlight and enter a low power mode. As soon as the selected input(s) is (are) present again, the display will exit the power save mode and display the image. Also, by activating the OSD menu, the display will exit power save mode.

When the *Auto search* function is enabled (see “Auto search”, page 40), the display will not enter the power save mode, even when the input(s) is (are) missing.

To enable/disable power saving

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Power Saving* submenu.
4. Enable/Disable power saving as desired and confirm.

5.5.5 DVI output

About DVI output

This setting allows to enable or disable the DVI output function of your display. Enabling DVI output will duplicate the entire image on the screen (including OSD) to a FHD (1080p/1080i) signal on the DVI output connector. For 4K images, the center part of the image will be down-scaled to FHD resolution.

To enable/disable DVI output

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *DVI output* submenu.
4. Enable/Disable DVI output as desired and confirm.

5.5.6 Operating hours

About operating hours

This information shows the operation hours of your display.

To consult operating hours

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. The operation hours of your display are shown at the bottom of the menu.

Important information

6

6.1 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.

Preventive maintenance

Periodic maintenance inspections are essential to keep the monitor in optimum condition and ensure safe operation.

With the monitor disconnected from the mains, perform the following periodic check:

- Check the integrity of the power cord and inspect its routing, so that it is not under the risk of being punched or cut.
- Check the integrity of the protective earth connection.
- Clean the area around the power plug. Dust and liquids may result in fire.
- Clean the ventilation slot of the monitor. Dust can obstruct the air flow and cause temperature increase of the electronics.

General recommendations:

- Keep the monitor clean to prolong its operational lifetime.
- LCD panel performance may deteriorate in the long term. Periodically check that it is correctly operating.
- Periodically check the tightness of the VESA mount screws. If not sufficiently tight, the monitor may detach from the arm, which may result in injury or equipment damage.
- In case the failover functionality is used, periodically check the OSD menu settings to verify the correct assignment of main and secondary input (backup) and perform a test to verify the correct activation of the backup input.

Type of protection (Electrical)

Equipment 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.
- The equipment shall not be operable when the air oxygen content is above 25%.

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 user should not touch the equipment, nor its signal input ports (SIP)/signal output ports (SOP) and the patient at the same time.
- If the above 2 points cannot be guaranteed, the monitor must be powered by an isolation transformer.
- The equipment shall not be used with life support equipment.

Mission critical applications

We strongly recommend there is a replacement monitor immediately available in mission critical applications.

Use of Electrical Surgical Knives

Provide as much distance as possible between the electrosurgical generator and other electronic equipment (such as monitors). An activated electrosurgical generator may cause interference with them. The interference can activate the OSD menu of the display and as such disrupt the functionality of the display.

Power connection – Equipment with internal power supply

- This equipment must be earthed.
- Power requirements: The equipment must be powered by the AC mains voltage.
- The equipment should be installed near an easily accessible outlet.
- The equipment is intended for continuous operation.

Transient over-voltage

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

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 well shielded interface cables for the connection to peripheral devices.

Connection of PEMS by network/data coupling to other equipment (MDSC-8255 MNA only)

- Connection of the PEMS to a network/data coupling that includes other equipment could result in previously unidentified risks to patients, operators or third parties.
- The responsible organization should identify, analyze, evaluate and control these risks.
- Subsequent changes to the network/data coupling could introduce new risks and require additional analysis.
- Changes to the network/data coupling include:
  - changes in network/data coupling configuration;
  - connection of additional items to the network/data coupling configuration;
  - disconnecting items from the network/data coupling configuration;
  - update of equipment connected to the network/data coupling configuration;
  - upgrade of equipment connected to the network/data coupling configuration

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 equipment or on a tag on the power cord.

Grounding reliability

Grounding reliability can only be achieved when the equipment is connected to an equivalent receptacle.

Water and moisture

The equipment is IP20 compliant. The monitor front side is IPX5 compliant.

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 happens, let the monitor stand unplugged until there is no condensation.

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 equipment 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 equipment may fall, causing serious injury to a child or adult, and serious damage to the equipment.
- Do not allow to climb or rest on the equipment.
- The monitor has been designed to be used in landscape position with a tilt of -10° (backward) and +10° (forward)
- When adjusting the angle of the equipment, move it slowly so as to prevent the equipment from moving or slipping off from its stand or arm.
- When the equipment is attached to an arm, do not use the equipment as a handle or grip in order to move the equipment. Please refer to the instruction manual of the arm for instructions on how to move the arm with the equipment.
- Provide full attention to safety during installation, periodic maintenance and examination of this equipment.
- Sufficient expertise is required for installing this equipment, especially to determine the strength of the wall for withstanding the display's weight. Be sure to entrust the attachment of this equipment to the wall to licensed contractors of Barco and pay adequate attention to safety during the installation and usage.
- All devices and complete setup must be tested and validated before taking into operation.
- At end user application level it is necessary to foresee a backup unit in case the video falls away.
- Barco is not liable for any damage or injury caused by mishandling or improper installation.

Malfunctions

Disconnect the equipment’s power cord from the AC inlet and refer servicing to qualified service technicians under the following conditions:

- If the power cord or plug is damaged or frayed.
- If liquid has been spilled into the equipment.
- If the equipment has been exposed to rain or water.
- If the equipment does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
- If the equipment has been dropped or the cabinet has been damaged.
- If the product exhibits a distinct change in performance, indicating a need for service.

General warnings

- The device has no means to be incorporated in an IT-network in the clinical environment.
- The enclosure has to be checked upon collision damage, refer to qualified service personnel.
- The protective screen (if present) is made of tested high-resistance glass. Nonetheless there is the possibility that it may crack if subject to strong impacts. Evaluate and prevent the risk of possible breakages of the protective screen by correctly handling and positioning the monitor in the operating room.
- The monitor is intended for indoor use
- The monitor is not intended to be sterilized

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"

6.2 Cybersecurity

Hospital IT security

To prevent unauthorized access to the device, the organization incorporating the MDSC-8255 in their IT network shall have the necessary state-of-the-art policies, processes, standards and other security measures in place to incorporate, support and protect the device into the IT network. This shall include the application of risk management (e.g. by following IEC 80001-1:2010 or equivalent standards).

6.3 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	X	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
External Cables						
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
风扇 Fan	O	O	O	O	O	O
电源供应器 Power Supply Unit	X	O	O	O	O	O
文件说明书 Paper Manuals	O	O	O	O	O	O
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.

中国RoHS自我声明符合性标志 / China RoHS – SDoC mark

本产品符合《电器电子产品有害物质限制使用管理办法》和《电器电子产品有害物质限制使用达标管理目录》的要求。

This product meets the requirements of the “Management Rule on the Use Restriction of Hazardous Substances in Electrical and Electronic Products” and the “Management Catalogue for the Use Restriction of Hazardous Substances in Electrical and Electronic Products”.

绿色自我声明符合性标志可参见电子档文件

The green SDoC mark is visible in the digital version of this document.

RoHS

Directive 2011/65/EC on the restriction of certain hazardous substances in electrical and electronic equipment.

According to what declared by our components suppliers, this product is RoHS compliant.

6.4 Biological hazard and returns – Decommissioning

Decommissioning

When a device becomes obsolete or unusable, or is no longer needed by the health care facility, it enters the final stage of its life cycle: decommissioning.

Decommissioning is the process of disposing a device, or removing a device from its originally intended use in the health care facility to an alternative use.

Every health care facility or institution shall have standard operating procedures in place to decommission a device according to the Occupational Safety and Health Administration (OSHA) regulations or/and the World Health Organization (WHO) Decommissioning Medical Devices Technical guideline.

The seller / manufacturer of the device has no legal obligation on the device sold in the event that the health care facility or institution decides to activate the decommissioning process.

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.

6.5 Cleaning and disinfection

Instructions

- Be sure to unplug the power cord from the mains when cleaning your LCD monitor.
- Take care not to scratch the front surface with any hard or abrasive material.
- Dust, finger marks, grease etc. can be removed with a soft damp cloth (a small amount of mild detergent can be used on the damp cloth).
- Wipe off water drop immediately.

Possible cleaning solutions

- 250 ppm chlorine solution
- NaCl solution 0.9% – Sodim chloride 00-236
- Bacillol AF
- 1.6 percent aqueous ammonia
- Cidex® (2.4 percent glutaraldehyde solution)

- Sodium hypochlorite (bleach) 10 percent
- “Green soap” (USP)
- Like Cleansafe® optical cleaning liquid
- Isopropanol
- Haemosol solution (1% in 1 liter water)
- Chlorehexidine 0,5% in 70% Ethanol

6.6 Regulatory compliance information

Indications for use

- Wall mounted in the surgical room to show multiple images.
- Second display in CatLab. The device is not intended for diagnosis.
- Can be used in the patient area only if connected to an insulation transformer.

Intended usage environment

- 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.

Contra-indications

This display is not intended to be used for direct diagnosis and therapeutic interventional radiology.

Intended users

Surgical displays are intended to be used by trained medical practitioners.

Notice to the user and/or patient

Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

Factory address

Fimi S.r.l., Via Saul Banfi 1, 21047 Saronno, VA, Italy

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-003 (B) / NMB-003(B)

UKCA compliance

UK Responsible Person (UKRP): Barco UK Ltd, Building 329, Doncastle Road, Bracknell RG12 8PE, Berkshire, United Kingdom

6.7 EMC notice

General information

No specific requirement on the use of external cables or other accessories except power supply.

With the installation of the device, use only the delivered 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.

Electromagnetic emissions

The MDSC-8255 is intended for use in the electromagnetic environment (IEC 60601-1-2 4th edition) specified below. The customer or the user of the MDSC-8255 should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – Guidance
RF emissions CISPR 11	Group 1	The MDSC-8255 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 MDSC-8255 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 MDSC-8255 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 MDSC-8255 is intended for use in the electromagnetic environment (IEC 60601-1-2 4th edition) specified below. The customer or the user of the MDSC-8255 should assure that it is used in such an environment.

Immunity test	IEC 60601-1-2 4th edition (2014) Test levels	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 8kV contact ± 15kV air	± 8kV contact ± 15kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/ burst IEC 61000-4-4	± 2kV for power supply lines ± 1kV for input/ output lines	± 2kV for power supply lines ± 1kV for input/ output lines	Mains power quality should be that of a typical commercial or hospital environment
Surge IEC61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% U_T [1](> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5 seconds	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5 seconds	Mains power quality should by that of a typical commercial or hospital environment. If the user of the MDSC-8255 requires continued operation during power mains interruptions, it is recommended that the MDSC-8255 be powered from an uninterruptible power supply or a battery.

1. is the a.c. mains voltage prior to application of the test level.

Immunity test	IEC 60601-1-2 4th edition (2014) Test levels	Compliance level	Electromagnetic environment – guidance
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	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 Radiated RF IEC 61000-4-3	3 V/m (150 kHz to 80 MHz) 9 to 28 V/m in communication service channels up to 6 GHz	3 V/m (150 kHz to 80 MHz) 9 to 28 V/m in communication service channels up to 6 GHz	Portable and mobile RF communications equipment should be used no closer to any part of the MDSC-8255, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance **d = 1.2√P** **d = 1.2√P** 80 MHz to 800 MHz **d = 2.3√P** 800 MHz to 2.5 Ghz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[2] should be less than the compliance level in each frequency range.[3] Interference may occur in the vicinity of equipment marked with symbol: 

At 80 MHz and 800 MHz, the higher frequency range applies.

2. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the MDSC-8255 is used exceeds the applicable RF compliance level above, the MDSC-8255 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the MDSC-8255.
3. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

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

Recommended separation distance

The MDSC-8255 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer of the user of the MDSC-8255 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MDSC-8255 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter [4] W	Separation distance according to frequency of transmitter		
	150kHz to 80MHz $d=1.2\sqrt{P}$	80MHz to 800MHz $d=1.2\sqrt{P}$	800MHz to 2.5GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection form structures, object and people.

6.8 Explanation of symbols

Symbols on the device

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

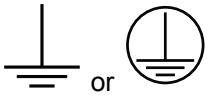
CE	Indicates the device meets the requirements of the applicable EC directives/ regulations.
FC	Indicates compliance with Part 15 of the FCC rules (Class A or Class B).
c UL us E346057	Indicates the device is approved according to the UL Recognition regulations.
CLASSIFIED c UL us E346057	MEDICAL – GENERAL MEDICAL EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI AS60601-1:2005/(R)2012, CSA CAN/CSA-C22.2 NO. 60601-1:14

4. For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter. Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

	Indicates the device is approved according to the UL regulations for Canada and US.
	Medical –general medical equipment as to electrical shocks, fire and mechanical hazards only in accordance with standards: ANSI/AAMI ES 60601-1:2005/(R)2012; CSA CAN/CSA-C22.2 NO. 60601-1:14; Also certified UL60950-1 (E92049).
	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 RCM 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 device is approved according to the BIS regulations.
	Indicates the device is approved according to the INMETRO regulations.

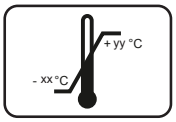
UK CA	Indicates the device meets the requirements of the UK MDR 2002 (as amended).
	Indicates the USB connectors on the device.
	Indicates the DisplayPort connectors on the device.
	Indicates the legal manufacturer.
	Indicates the manufacturing date.
	Indicates the entity importing the medical device into the locale.
	Indicates the temperature limitations[5] for the device to safely operate within specs.
MD	Indicates this is a Medical Device.
SN	Indicates the device serial number.
REF	Indicates the device part number or catalogue number.
UDI	Indicates the Unique Device Identifier.
EC REP	Indicates the Authorised Representative for the European Union.
CH REP	Indicates the Authorised Representative for Switzerland.
	**Warning**: dangerous voltage
	**Caution**
	Consult the Instructions For Use.

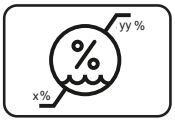
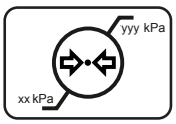
5. Values for xx and yy can be found in the technical specifications paragraph.

 eIFU indicator	Consult the Instruction For Use on website address that is provided as eIFU indicator.
	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).
	Stand-by
	Equipotentiality
 or	Protective earth (ground)

Symbols on the box

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

	Indicates a device that can be broken or damaged if not handled carefully when being stored.
	Indicates a 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.
 or 	Indicates the maximum number of identical boxes which may be stacked on each other, where “n” is the limiting number.
 or 	Indicates the weight of the box and that it 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[6] to which the device can be safely exposed when being stored.

	Indicates the range[6] of humidity to which the device can be safely exposed when being stored.
	Indicates the range[6]of atmospheric pressure to which the device can be safely exposed when being stored.

6.9 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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To protect our customers, Barco does not publicly disclose or confirm security vulnerabilities until Barco has conducted an analysis of the product and issued fixes and/or mitigations.

6.10 Technical specifications

Overview

Screen technology	TFT AM LCD / IPS technology / LED backlight
LCD panel active screen size (diagonal)	54.6" / 1388 mm
LCD panel active screen size (H x V)	1210 x 680 mm
LCD panel aspect ratio (H:V)	16:9
LCD panel resolution	3840 x 2160

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

Pixel pitch	0.315
Color support	1073 million (10-bit)
Color gamut	Native: Close to ITU709
	Calibrated color space: ITU 709 (default), BT. 2020, DCI-P3 D65
Viewing angle (H, V)	178° Hor / 178° Ver
Luminance	Native: 500 cd/m² (typical)
	Default setting: 300 cd/ m² @6500K stabilized
Backlight sensor	Automatic backlight stabilization
Contrast ratio	1100:1 (typical)
LCD response time (Tr + Tf)	8 ms (typical)
White point	Native: 10000K (Typical)
	Calibrated: 5600K, 6500K, 7600K, 9300K
Gamma	Native, 1.8, Video, 2.2, 2.4, DICOM
Housing color	RAL 9003
Screen protection	2-side anti-reflective laminated safety glass
Keyboard	Membrane keyboard
Video input signals (MDSC-8255 LED)	4K-UHD input • 1x DP 1.1 up to 3840 x 2160 @25Hz/30Hz • 2x DP 1.1 up to 1920 x 2160 @50Hz/60Hz • 1x DP 1.2 MST up to 3840 x 2160 @50Hz/60Hz • 2x HDMI 2.0 up to 3840 x 2160 @50Hz/60Hz
	FHD input (upscaled to UHD) • 1x DVI • 1x 3G-SDI
Video input signals (MDSC-8255 MNA)	4K-UHD input • 1x DP 1.1 up to 3840 x 2160 @25Hz/30Hz • 2x DP 1.1 up to 1920 x 2160 @50Hz/60Hz • 1x DP 1.2 MST up to 3840 x 2160 @50Hz/60Hz • 2x f.o. SFP+ for 4K-UHD Nexxis link
	FHD input (upscaled to UHD) • 1x DVI • 1x 3G-SDI
Video input signals (MDSC-8255 12G)	4K-UHD input • 1x DP 1.1 up to 3840 x 2160 @25Hz/30Hz • 2x DP 1.1 up to 1920 x 2160 @50Hz/60Hz • 1x DP 1.2 MST up to 3840 x 2160 @50Hz/60Hz • 2x HDMI 2.0 up to 3840 x 2160 @50Hz/60Hz • Quad-link 3G-SDI up to 3840 x 2160 @50Hz/60Hz • 2x 12G-SDI up to 3840 x 2160 @50Hz/60Hz
	FHD input (upscaled to UHD) • 1x DVI • 1x 3G-SDI
Video output signals	MDSC-8255 LED & MNA: • 1x 3G-SDI (input loop through) • 1x DVI (screen clone downscaled to FHD)
	MDSC-8255 12G: • 2x 12G-SDI (input loop through) • 1x DVI (screen clone downscaled to FHD)
Video formats	• Display Port 1.2 MST (10 bit) up to 3840x2160 @60Hz RGB 30bits/pixel • Dual stream DP 1.1 (10-bit) up to 1920x2160 x2 @60Hz RGB 30bits/pixel • HDMI 2.0 up to 3840x2160 @60Hz RGB/YCbCr (4:2:0/4:2:2/4:4:4) with HDCP 2.2 and 1.4

	• HDMI 1.4 up to 3840x2160 @30Hz RGB/YCbCr (4:2:2/4:4:4) with HDCP 1.4 • DVI (8 bit) up to 1920x1080 @60Hz with HDCP 1.3 • SDI compliance standards: 12G-SDI (10 bit): SMPTE ST-2082-10 QUAD LINK 3G-SDI (10 bit): SMPTE ST 425-5 (Level A) 3G-SDI (10 bit): SMPTE ST 424/425 (Level A) HD-SDI (10 bit): SMPTE ST 292 SD-SDI (10 bit): SMPTE ST 259
Remote control	Use Type B port for FW download & DDC protocol on DVI and DP auxiliary channel (on DP main connector)
Power consumption (Max)	MDSC-8255 LED: 144 W MDSC-8255 MNA: 200 W MDSC-8255 12G: 162 W
Power requirements	100-240 VAC / 50/60 Hz / 1.9-0.9 A
DC power output	DVI connector: +5V on pin 14 & 16 / 500mA DP connector: +3.3V / 500mA DC out connector: +5V / 2A USB connector: +5V / 1A
Power management	MDSC-8255 LED: • Low power mode: 18 W (typical) • Power-off: ~ 1 W MDSC-8255 MNA: • Low power mode: 52 W (typical) • Power-off: ~ 1 W MDSC-8255 12G: • Low power mode: 33 W (typical) • Power-off: ~ 1 W
Dimensions display (W x H x D)	1259 x 733 x 87 mm (49.5 x 28.8 x 3.4 in)
Net weight display	MDSC-8255 LED: 33.2 kg (73.1 lbs) MDSC-8255 MNA: 34.2 kg (75.3 lbs) MDSC-8255 12G: 33.5 kg (73.8 lbs)
Net weight packaged	MDSC-8255 LED: 39.7 kg (87.5 lbs) MDSC-8255 MNA: 41.2 kg (90.8 lbs) MDSC-8255 12G: 40.6 kg (89.5 lbs)
Mounting standard	VESA (200 mm, 600 mm)
Applicable standards	• ANSI/AAMI ES 60601-1:2005/(R)2012 and A1:2012, C1:2009/(R)2012 and A2:2010/(R)2012 (Medical Electrical Equipment - Part 1: General requirements for basic safety and essential performance) • CAN/CSA-C22.2 No. 60601-1: 14 (Medical Electrical Equipment - Part 1: General requirements for basic safety and essential performance (harmonized with Ed. 3.1)) • IEC 60601-1: 2012 Edition 3.1 (Medical Electrical Equipment – Part 1: General requirements for basic safety and essential performance) • EN 60601-1: 2006 + A1:2013 (Medical Electrical Equipment – Part 1: General requirements for safety) • Electromagnetic Compatibility: EMC Medical EMC Standards: IEC60601-1-2 (2014), EN 60601-1-2 (2015), FCC CFR47 part 15 Subpart B/ Class B • RoHS-3, REACH, WEEE
Operating temperature	0 ÷ 35 °C (for performance); 0 ÷ 40 °C (for safety)
Storage temperature	-20 ÷ +60°C
Operating humidity	10 ÷ 90% (non-condensing)
Storage humidity	5 ÷ 90% (non-condensing)

Timings full-HD & 4MP (MDSC-8255 LED & MNA)

Format	SDI	DVI	HDMI[7]	DP 1.1
720x487i@59.94Hz (NTSC)	Y	N	N	N
720x480p@59.94Hz	N	Y	Y	Y
720x480p@60.00Hz	N	Y	Y	Y
720x576i@50.00Hz (PAL I)	Y	N	N	Y
720x576p@50.00Hz	N	Y	Y	Y
800x600p@56.25Hz	N	Y	N	Y
800x600p@60.317Hz	N	Y	Y	Y
800x600p@72.19Hz	N	Y	N	Y
800x600p@75.00Hz	N	Y	N	Y
1024x768p@60.00Hz	N	Y	Y	Y
1024x768p@70.069Hz	N	Y	N	Y
1024x768p@75.029Hz	N	Y	N	Y
1024x768p@85.00Hz	N	Y	N	Y
1152x864p@75.00Hz	N	Y	N	Y
1280x720p@29.97Hz	N	Y	N	Y
1280x720p@30.00Hz	N	Y	N	Y
1280x720p@50.00Hz	Y	Y	Y	Y
1280x720p@59.94Hz	N	Y	Y	Y
1280x720p@60.00Hz	N	Y	Y	Y
1280x1024p@60.00Hz	N	Y	Y	Y
1280x1024p@75.025Hz	N	Y	N	Y
1280x1024p@85.00Hz	N	Y	N	Y
1400x1050p@60.00Hz	N	Y	N	Y
1600x1200p@60.00Hz	N	Y	Y	Y
1680x1050p@59.95Hz	N	Y	N	Y
1920X1080i@50Hz	Y	Y	Y	Y
1920X1080i@59.94Hz	Y	Y	Y	Y
1920X1080i@60Hz	Y	Y	Y	Y
1920x1080p@25Hz	Y	Y	Y	Y
1920x1080p@29.97Hz	Y	Y	Y	Y
1920x1080p@30.00Hz	Y	Y	Y	Y
1920x1080p@50.00Hz	Y	Y	Y	Y

7. MDSC-8255 LED version only

1920x1080p@59.94Hz	Y	Y	Y	Y
1920x1080p@60.00Hz	Y	Y	Y	Y
1920x1200p@60.00Hz	Y	Y	Y	Y
2048x1536p@60.00Hz	N	N	N	Y
2560x1440p@60.00Hz	N	N	Y	Y
2560x1600p@60.00Hz	N	N	Y	Y

Timings full-HD & 4MP (MDSC-8255 12G)

Format	SDI	DVI	HDMI	DP 1.1
720x480p@59.94Hz	N	Y	Y	Y
720x480p@60.00Hz	N	Y	Y	Y
720x576p@50.00Hz	N	Y	Y	Y
800x600p@56.25Hz	N	Y	N	Y
800x600p@60.317Hz	N	Y	Y	Y
800x600p@72.19Hz	N	Y	N	Y
800x600p@75.00Hz	N	Y	N	Y
1024x768p@60.004Hz	N	Y	Y	Y
1024x768p@70.069Hz	N	Y	N	Y
1024x768p@75.029Hz	N	Y	N	Y
1024x768p@85.00Hz	N	Y	N	Y
1152x864p@75.00Hz	N	Y	N	Y
1280x720p@29.97Hz	N	Y	N	Y
1280x720p@30.00Hz	N	Y	N	Y
1280x720p@50.00Hz	Y	Y	Y	Y
1280x720p@59.94Hz	Y	Y	Y	Y
1280x720p@60.00Hz	Y	Y	Y	Y
1280x1024p@60.013Hz	N	Y	Y	Y
1280x1024p@75.025Hz	N	Y	N	Y
1280x1024p@85.00Hz	N	Y	N	Y
1400x1050p@60.00Hz	N	Y	N	Y
1600x1200p@60.00Hz	N	Y	Y	Y
1680x1050p@59.95Hz	N	Y	N	Y
1920X1080i@50Hz	Y	Y	Y	Y
1920X1080i@59.94Hz	Y	Y	Y	Y
1920X1080i@60Hz	Y	Y	Y	Y

1920x1080p@25Hz	Y	Y	Y	Y
1920x1080p@29.97Hz	Y	Y	Y	Y
1920x1080p@30.00Hz	Y	Y	Y	Y
1920x1080p@50.00Hz	Y	Y	Y	Y
1920x1080p@59.94Hz	Y	Y	Y	Y
1920x1080p@60.00Hz	Y	Y	Y	Y
1920x1200p@60.00Hz	N	Y	Y	Y
2048x1536p@60.00Hz	N	N	N	Y
2560x1440p@60.00Hz	N	N	Y	Y
2560x1600p@60.00Hz	N	N	Y	Y

Timings UHD / 4K

Format	HDMI[8]	DP 1.1	DP 1.1 Dual	DP 1.2 MST	Quad-link SDI	6G–SDI / 12G-SDI [9]
3840x2160@25.00Hz	Y	Y	Y	Y	N	Y
3840x2160@30.00Hz	Y	Y	Y	Y	N	Y
3840x2160@50.00Hz	Y	N	Y	Y	Y	Y
3840x2160@60.00Hz	Y	N	Y	Y	Y	Y

6.11 Troubleshooting

Overview

Problem	Description	Possible solution
Serial connection not available	After reboot, the serial connection on the USB type B port is not present (COM port not visible).	Reboot the display.
OSD disappears during input signal switching	OSD disappears during input signal switching (maximum 2 seconds).	No action required. This is normal behavior.
The Image Is not shown correctly or is missing	The image shown on the monitor is not displayed correctly or is missing	Reselect the input – if does not solve the problem reboot the display.
Flashing image/Left side image not shown in DP Dual Mode	During Auto search cycles or exit from power save mode, the DP dual image is not restored correctly.	Reselect the input or reboot the display.
Half of the screen corrupted in HDMI UHD 4:2:0	After switching from a profile with HDMI UHD 4:2:0 input to another profile with the same input, half of the screen could be corrupted.	Reselect the input or reboot the display.

8. MDSC-8255 LED and 12G versions only
9. MDSC-8255 12G version only / Accepted formats: Square-division & 2-sample interleave

Problem	Description	Possible solution
Dark pixel column is displayed in the center of the screen	In DP Dual Mode and resolution lower than 1600x1200x2, a ‘dark pixel column’ is displayed in the center of the screen.	Use a horizontal resolution of at least 1920 pixel.
Connecting DVI cable to a PC does not cause auto-detection	After a power cycle, DVI EDID seems not to be available (connecting DVI cable to a PC does not cause auto-detection) until DVI input is selected.	Select the DVI input when the Display need to expose the EDID on the DVI channel.
PC connected to DP hang	Switching between DP and Video-over-IP or SDI inputs after DP 1.1 is configured on PC, causes PC to hang.	Select the input before powering the PC.
Switching SDI-4K modes – the image is not displayed[10]	The SDI-4K image could not be displayed when Switching between different SDI-4K modes.	Reselect the SDI-4K mode
Switching different profiles with 4K image – Only right part image displayed[10]	Switching from one profile with SDI-4K selected input (e.g. Single SDI-1) to another with DP 1.2 selected input, only right part of the DP image is displayed (centered).	Reboot the display.

10. MDSC-8255 12G version only

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