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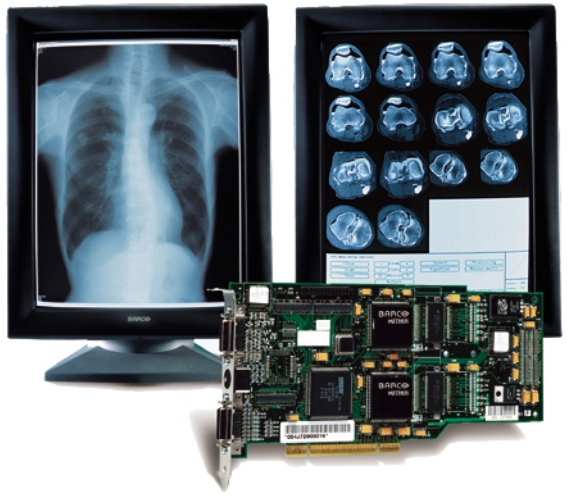
MEDIS
2MP2 - 2MP1NT-MGD 221



System Manual

CONTENTS

INTRODUCTION

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INTRODUCTION

BARCO MeDis® is a total display solution for medical applications. MeDis 2MP2 can be a single-head or multi-head system, MeDis 2MPNT1 is a single-head system only. MeDis comes with everything you need to set-up a complete viewing system, from video cables to displays.
The MeDis system can be delivered with MGD 221, MGD 2621P or MGD 2621L displays.

Contents of the package

Please refer to the packing list on the outside of the MeDis box.

Please contact BARCO if the content of the package does not correspond to the list.

Other relevant documents

- MediCal Pro Installation and User Manual

MeDis installation overview

To install the MeDis system completely, you have to follow these steps:

1 Install the imaging board(s) in the PC
2 Install and connect the displays to the PC
3 Install the BarcoMed driver software
4 Install the MediCal software
5 Use MediCal

Important installation considerations

Preparations before installation

1 Make sure all equipment is switched off.
2 In case you use a PCI extension box, please install the box following the guidelines in its Installation or User's guide.

Considerations for the installation itself

1 This manual contains Hardware Installation Guidelines. Install the board(s) in the PC or PCI extension box following these guidelines and precautions (esp. **ESD protection**).

For MeDis 2MP2 only : Take the following additional guidelines into account:

2 Each imaging board from the MeDis 2MP2 system contains 2 heads. Accordingly, the board is numbered with 2 digits. E.g., the first board is numbered "1-2", meaning the board contains heads 1 and 2. The second board, containing heads 3 and 4, if present, is numbered "3-4". You can find these numbers on a label on the connector plate of the board.

3 In a multi-board system, the order in which you place the boards in the PC or extension box, is not random: They must be placed in ascending order, taking the order number of the PCI slots into account.
E.g., board labeled "1-2" must be placed in PCI slot #4, board labeled "3-4" in slot #5, etc.

4 In case the PCI slots are not numbered on the PC motherboard, you can probably find the correct order in the main board's user manual.
If not, it is hard to know which is the slot with the lowest number. In that case, you have to follow a try-and-error procedure. If the boards are not placed in the correct slots, you will notice the displays show their part of the complete image in an incorrect sequence after installation (e.g., the leftmost part of the image is displayed by the rightmost display). If this phenomenon occurs, you will have to switch the boards and their video cables until the image is displayed in the correct sequence.

IMAGING BOARD INSTALLATION

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PRODUCT OVERVIEWS

2MP2 Product Overview

Introduction

The BarcoMed 2MP2 Graphics Controller delivers a quality 1200 x 1600 pixel image with 256 simultaneous shades of gray for medical imaging applications.

Features of the BarcoMed 2MP2

- Dual Head Configuration
- 1200 x 1600 resolution at 75 Hz
- 10 bit input DAC
- 4 MB Video Memory (VRAM)
- Portrait or Landscape Mode
- 256 Simultaneous shades of gray from a Palette of 1024
- Fully compatible with the BarcoMed 2MP1NT
- Hardware cursor
- Single slot PCI card
- Display Properties Control Panel to dynamically change display settings

- Control Panel support for the English (U.S.), Dutch, German, Japanese, Korean, Simplified Chinese and Traditional Chinese languages

Minimum System Requirements

- PCI slot with no obstructions
- PCI 2.1 Compliant System
- VGA compatible high resolution displays or a separate VGA card and display
- NT 4.0 SP4 and above, Windows 2000 SP1 and above, or Windows XP

Supported Resolutions For Each Head of the 2MP2

- 1600x1200 @ 80 Hz
- 1280x1024 @ 75 Hz
- 1200x1600 @ 66 Hz

- 1200x1600 @ 74 Hz
- **1200x1600 @ 75 Hz (primary)**
- 1024x768 @ 75 Hz
- 1024x1280 @ 67 Hz
- 1024x1280 @ 70 Hz
- 800x600 @ 75 Hz
- 640x480 @ 75 HZ

2MP1NT Product Overview

Introduction

The BarcoMed 2MP1NT Graphics Controller delivers a quality 1200 x 1600 pixel image with 256 simultaneous shades of gray for medical imaging applications.

Features of the BarcoMed 2MP1NT

- Single Head Configuration
- 1200 x 1600 resolution at 75 Hz
- 10 bit input DAC
- 4 MB Video Memory (VRAM)
- Portrait or Landscape Mode
- 256 Simultaneous shades of gray from a Palette of 1024
- Fully compatible with the BarcoMed 2MP2
- Hardware cursor
- Single slot PCI card
- Display Properties Control Panel to dynamically change display settings
- Control Panel support for the English (U.S.), Dutch, German, Japanese, Korean, Simplified Chinese and Traditional Chinese languages

Minimum System Requirements

- PCI slot with no obstructions
- PCI 2.1 Compliant System
- VGA compatible high resolution displays or a separate VGA card and display
- NT 4.0 SP4 and above, Windows 2000 SP1 and above, or Windows XP

Supported Resolutions

- 1600x1200 @ 80 Hz
- 1280x1024 @ 75 Hz
- 1200x1600 @ 66 Hz
- 1200x1600 @ 74 Hz
- **1200x1600 @ 75 Hz (primary)**

- 1024x768 @ 75 Hz
- 1024x1280 @ 67 Hz
- 1024x1280 @ 70 Hz
- 800x600 @ 75 Hz
- 640x480 @ 75 HZ

HARDWARE INSTALLATION

Notice: Wear a protective ESD strap during installation or handling of the board. Electrostatic charges can damage the board.

Familiarizing Yourself With the BarcoMed 2MP2 or BarcoMed 2MP1NT Imaging Board

Prior to installing your 2MP2 or 2MP1NT board(s) in your PC please take a few minutes to familiarize yourself with both the board and the PCI slots in your computer**.**

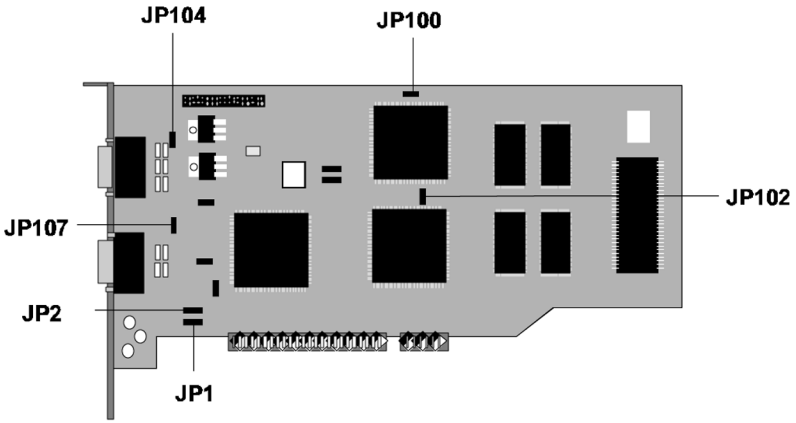

Figure 1: The BarcoMed 2MP2 and BarcoMed 2MP1NT

Jumper Location

There is one user settable jumper on the BarcoMed 2MP2 and BarcoMed 2MP1NT. It is used to enable or disable the VGA capabilites of the board.

Using the VGA Capabilities of the BarcoMed 2MP2 or BarcoMed 2MP1NT

Prior to installing the BarcoMed 2MP2 or BarcoMed 2MP1NT, decide if you are going to use its on-board VGA capabilities. If you are,

check the setting of the Jumper at J-100 on the graphics board. (See Figure 1 on the preceding page.) By default, VGA should be disabled, i.e. on both pins. If you decide to use your multisyncing high resolution grayscale monitor as your boot monitor, you must enable the on-board VGA capabilities of the BarcoMed 2MP2 or 2MP1NT Imaging Board by removing the jumper from the pins at J-100. We suggest placing the jumper on only one of the two pins, so that you don't lose the jumper.

NOTE: To use multiple BarcoMed 2MP2 and/or BarcoMed 2MP1NT Imaging Board(s) in a single host with VGA enabled, you need to enable VGA on only ONE of the BarcoMed 2MP2 and/or BarcoMed 2MP1NT Imaging Board(s) and disable VGA on ALL other BarcoMed Imaging Board(s).

Standard Jumper Functions

Jumper	Function
JP100	Primary VGA enable (Off Pins). Open for primary display only.
JP200, JP201, JP106, JP101, JP103, JP105	Factory testing only. Do NOT Change.

Figure 2: 2MP2 and 2MP1NT Jumper Settings Table

Installing the BarcoMed 2MP2 or 2MP1NT Graphics Controller

To install the BarcoMed 2MP2 or BarcoMed 2MP1NT into your computer, follow these steps:

1) Turn off the power to your computer and disconnect the power cord.
2) Remove the chassis cover according to the manufacturer's instructions. Be sure to observe safety warnings.
3) If you have decided to use the on-board VGA capabilities of the BarcoMed 2MP2 or BarcoMed 2MP1NT (see Using the VGA capabilities of the BarcoMed 2MP2 or BarcoMed 2MP1NT), you **must now remove** any VGA cards that are currently installed in the computer. You may also need to uninstall the drivers for that VGA board. (Consult the User Guide for your VGA board for instructions on removing the driver.) If your system has an integrated VGA card you may need to make changes to your system's BIOS settings in order to use the VGA capabilities of your BarcoMed board. (Consult your system manual(s) for instructions on making changes to the BIOS settings.)

   SPECIAL NOTE: If you have a separate VGA card and it has a Cirrus chip, you must remove it from your system before installing the BarcoMed 2MP2 or BarcoMed 2MP1NT. If you have on-board VGA that uses a Cirrus chip, consult your system manual on how to disable it before installing the BarcoMed board(s). Once the system VGA is disabled, you must ensure that the BarcoMed board's VGA capabilities are enabled if you want to see your boot messages.
4) Install the BarcoMed 2MP2 or BarcoMed 2MP1NT Graphics Controller into a free PCI slot. Be sure that the board is seated firmly in the slot.
5) Secure the card to the chassis with the PC's I/O panel mounting screw, and replace the chassis cover.
6) Connect the left-hand display to the uppermost connector on the BarcoMed 2MP2 or BarcoMed 2MP1NT (VID 1 - see figure 3 on next page) using the provided video cable. For a dual-headed BarcoMed 2MP2 setup, connect the right-hand display to the other connector (VID 2) on the board.
7) Each of the display cables has three BNC connectors on it. The green one is the video, the black one is the horizontal sync, and the white one is the vertical sync.
8) Install the power cord, turn on the power, and boot the system as usual.

Running Multiple BarcoMed 2MP Boards in a Single Host

NOTE: The physical order of the displays may vary when you are running multiple BarcoMed 2MP boards. This is due to the PC's PCI bus control in the system BIOS, and not the BarcoMed board. It may

become necessary, depending on how your PC's BIOS configures the PCI bus, to switch your BNC display connections to achieve a linear desktop configuration.

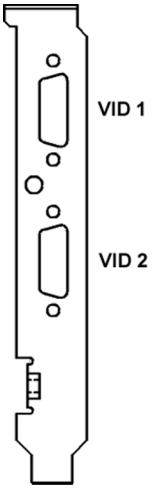

Figure 3: The Video Outputs.

DISPLAY INSTALLATION

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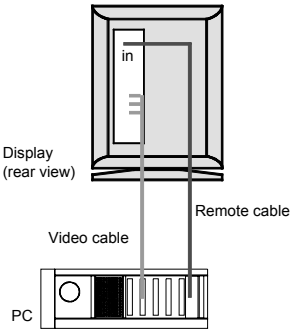
DISPLAY INSTALLATION

Examples



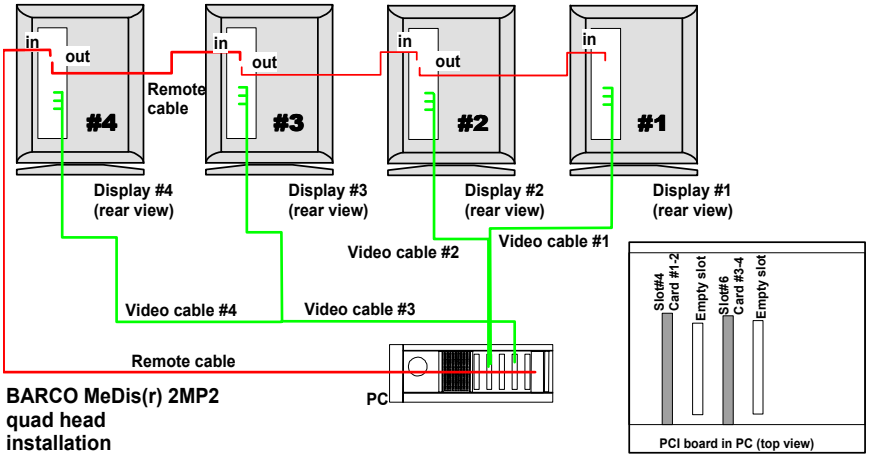
BARCO MeDis(r) 2MP1NT installation

Figure 4

An example of a correct set-up of MeDis 2MP1NT is shown in figure 4, of MeDis 2MP2 in figure 5.

The examples show set-ups with MGD 221 displays, but could as well have been with MGD 2621L or MGD 2621P.

Please take a good look at the illustrations, and then read the rest of the text very carefully.



BARCO MeDis(r) 2MP2 quad head installation

Figure 5

Placing and configuring the displays

1 The last part of this system manual is a copy of the display user manual. Follow the precautions and guidelines from this part.

2 The display(s) from a multihead MeDis system are numbered. E.g., in a quad-head system, the displays are numbered 1 to 4. You can find the number of the display on a label at the rear side.

3 In a multi-head system, the order in which you place the displays is not random: From left to right or from top to bottom in ascending order.

4 The displays' remote addresses are properly set at the factory. The addresses correspond to the display numbers on the rear label: Display #1 has address 1 etc.
Note: Should anything be wrong with the display addresses, this can easily be solved by running the 'Configuration Setup Wizard' in MediCal Pro.

For more information, please refer to the **MediCal** part of this manual.

Connection of the video cables

MeDis 2MP1NT

Plug in the D15 connector of the video cable into the connector of the imaging board, as described in the BarcoMed installation guidelines inside this manual.

Plug in the large coaxial connectors (BNC) of the video cable into the connectors of the display.

The video cable connector with green plastic plugs into the display connector marked "Video".

The connector with black plastic plugs into the display connector marked "HS/CS". The connector with white plastic plugs into the display connector marked "VS".

MeDis 2MP2

1 The video cables from the MeDis system are numbered. You can find the number on a label on the cable.
The cable number must correspond to the head (on the imaging board) and the display it is connected to: E.g., cable #1 must connect head #1 (on the first imaging board) to display #1, cable #2 must connect head #2 (also on the first board) to display #2, etc.

2 Plug in the D15 connector of the video cable into the connector of the imaging board, as described in the BarcoMed installation guidelines.

3 Plug in the large coaxial connectors (BNC) of the video cable into the connectors of the display. Plug in the cable connector marked with green plastic, into the display connector marked "Video". Plug in the cable connector marked with black plastic, into the display connector marked "HS/CS". Plug in the cable connector marked with white plastic, into the display connector marked "VS".

Connection of the Remote cables

Note: One of the remote cables is packed inside the MediCal box.

1 The Remote cables that come with MeDis are not numbered. It does not matter which cable you connect to which display, as long as you take the Remote inputs and outputs on the displays into account.

2 Take one of the remote cables from the MeDis system. Plug in its D9 female connector into one of the PC's serial ports (e.g., COM1). If the port has 25 pins, use the D25-to-D9 interface you find in the MediCal software box to connect the remote cable.
Plug the other end, the D9 male connector, into the **Remote In** connector on one of the displays.

3 In case of a multi-head system, take a second Remote cable. Plug the D9 female connector into the **Remote Out** connector of the display you have connected in step 2. Plug the other end of the cable into the **Remote In** connector of another display.

4 Proceed in this way until all displays are daisy-chained through the Remote bus.

Power up the system

Connect the displays and PC to the power supply. Switch on all the devices.

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BARCOMED SOFTWARE DRIVER INSTALLATION

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SOFTWARE INSTALLATION

Overview

The BarcoMed 2MP Family Software Installation section has been divided into three sections, one for each of the three supported versions of the Windows operating system. They are: Windows NT 4.0, Windows 2000 and Windows XP.

Because of Windows 2000's and Windows XP's Plug and Play features and their ability to support multiple types of imaging boards simultaneously, those sections have been further subdivided by the various BarcoMed imaging board models. Since Windows NT 4.0 supports only one type of imaging board at a time, the process for installing the drivers for the BarcoMed imaging boards is identical regardless of which model you are using.

In addition to the device drivers for your BarcoMed imaging boards, your BarcoMed Software CD also includes several additional tools. They are: The Barco Metheus Configuration Tab, the Barco Metheus Hardware Configuration Tab and the Barco Metheus DPMS Screen Saver. The Barco Metheus Configuration Tab and the Barco Metheus Hardware Configuration Tab are automatically installed with BarcoMed imaging board drivers. The Barco Metheus Configuration Tab helps you manage the special features of your BarcoMed imaging boards. The Barco Metheus Hardware Configuration Tab gathers information about the BarcoMed imaging boards and your system that is useful when diagnosing problems. The Barco Metheus Hardware Configuration Tab can also be used to update the firmware on the AURA video chipset based BarcoMed imaging boards. The Barco Metheus DPMS (Display Power Management Signaling) Screen Saver is an optional tool which must be installed separately. The Barco Metheus DPMS Screen Saver allows the user to set power and monitor saving features for medical monitors driven by BarcoMed Imaging Boards. At the end of the workday, the monitor will enter certain DPMS states as requested by the imaging board. This is accomplished through standardized signals between the monitor and imaging board. Instructions for installing the Barco Metheus DPMS Screen Saver are included in the chapter on the Barco Metheus DPMS Screen Saver.

Installing the Windows NT 4.0 Driver for the BarcoMed 2MP2H, 2MP2, 2MP1NT or 2MP1 Boards

SPECIAL NOTE: Prior to installing the BarcoMed drivers you MUST install the BarcoMed Imaging Board(s), connect the monitor(s) to the card(s), and turn the monitor(s) on. Refer to the Hardware Installation Guide that came with your BarcoMed Imaging Board(s) for instructions on installing the BarcoMed Imaging Board(s) and connecting them to the monitor(s).

To install the BarcoMed 2MP2H, 2MP2, 2MP1NT or 2MP1 Windows NT Display Driver, log on using an account with administrator privileges. Insert the BarcoMed Driver Media into your machine's appropriate drive and follow these steps:

1. Open the "Display Properties Control Panel" by right clicking on the desktop, then select "Properties".
2. Click on the **"Settings"** Tab.
3. Select **"Display Type**".
4. Select **"Change"**.
5. Select **"Have Disk"**.
6. Select the correct drive from the drive menu and click on **"OK"**.
7. Select the appropriate BarcoMed product and click on **"OK"**.
8. You will see a message saying that this is a Third Party Driver and asking if you wish to proceed. Click on **"Yes"**.
9. The driver files will be copied onto your system.
10. You will receive a message saying the driver is successfully installed. Click on **"OK"**.
11. Close the **"Display Type"** dialogue box.
12. Close the **"Display Properties"** dialogue box.
13. You will be asked if you want to restart your computer. Select **"Yes"**.
14. When the system comes back up, select **"NT Version 4.00 (VGA Mode)."** Log on using an account with administrator privileges.
15. The **"Invalid Display Settings"** dialog box will appear with the following message: " A new graphics driver has been installed. The default display resolution from the driver has been temporarily used by the system. Please use the Display option in the Windows NT Control Panel to select your preferred display resolution." Click **"OK"**.

16. The **“Display Properties”** dialog box will appear. (See figure 6 on the next page.)
17. Under the **“Settings”** tab, select **“List all Modes”**.
18. Select the desired resolution from the list.

    For example:
    “1200x1600x256” at 75Hz. Click “OK.”

    NOTE: If you have multiple single-headed imaging boards (2MP1s & 2MP1NTs), the resolution will be the size of your “virtual desktop.”

    For example: if you have 2 displays running at “1200x1600x256 at 75Hz” you would select the following resolution: “2400x1600x256 at 75Hz”.
19. Select the **“Test”** button and click on **“OK”** to test the display. You will be asked if it displayed correctly. If the test pattern displays correctly, select **“Yes”**. If not, try selecting another mode from the **“List all Modes”** button.
20. In order to apply your changes, type **“<Ctrl> + Enter”**. Restart your computer when prompted.
21. When your system comes back up select the **“NT Version 4.00”** option (NOT the VGA Mode option). Log on as usual.
22. Continue on to the section, **“BARCO Metheus Configuration Tab”**, if you wish to further configure the driver.

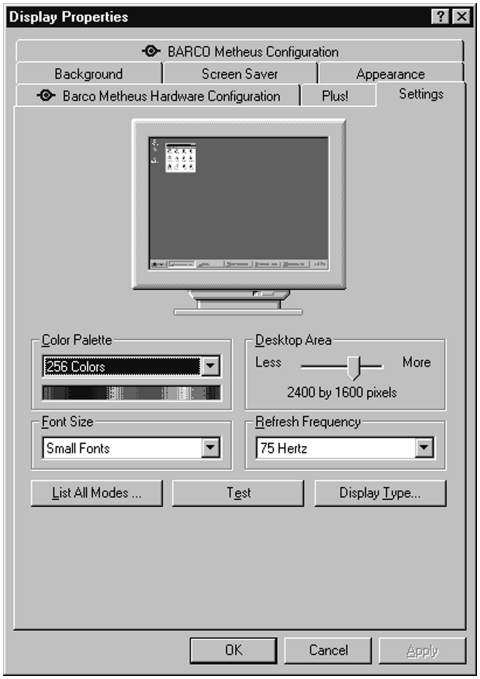


Figure 6: Windows NT 4.0 Display Control Panel Settings Tab.

Note: In the system shown above there were two BarcoMed 2MP1NT imaging boards installed and no 3rd party VGA card. Your configuration may be different.

Planning Your Barcomed Windows 2000 Installation

Because of Windows 2000's Plug and Play features, it is very important to carefully plan your BarcoMed Board Hardware and Software installation and install the device drivers in the same sequence that the boards are installed in the PCI slots.

When installing BarcoMed Imaging Boards for the first time in a Windows 2000 System, Windows 2000 Plug and Play Software identifies the BarcoMed boards by the Video Chipset utilized on each boards. The Table below shows the BarcoMed Board, the Chip Set utilized by the board and the driver Windows 2000 Plug and Play selects for each imaging board.

BarcoMed Board Model	Chip Set Utilized	Driver Selected by Windows 2000 Plug and Play
2MP2H	BarcoView AURA	Video Controller or Video Controller (VGA Compatible)
2MP2	Cirrus Logic Laguna 5465	Cirrus Logic Laguna 5465
2MP1NT	Cirrus Logic Laguna 5465	Cirrus Logic Laguna 5465
2MP1	Imagine Number 9	Imagine Number 9 Series 128

If you have previously installed drivers for the BarcoMed Imaging Boards in your Windows 2000 System, Windows 2000 should correctly identify the board by their correct BarcoMed name. However, while updating the drivers to a new version or reinstalling the current driver Windows 2000 may identify the BarcoMed Imaging Boards by their Video Chipset.

If you choose to install multiple types of BarcoMed Imaging Boards in your computer it is important to carefully note which PCI slot each board is in and then install the drivers for each type of board based on the PCI slot they are installed in. **If you are using the VGA Capabilities of a BarcoMed Imaging Board it is important to install the driver for this board and set its resolution first.**

Installing the Windows 2000 driver for the BarcoMed 2MP2

SPECIAL NOTE: Prior to installing the BarcoMed drivers you MUST install the BarcoMed Imaging Board(s), connect the monitor(s) to the card(s), and turn the monitor(s) on. Refer to the Hardware Installation Guide that came with your BarcoMed Imaging Board(s) for instructions on installing the BarcoMed Imaging Board(s) and connecting them to the monitor(s).

To install the BarcoMed 2MP2 Windows 2000 Display Driver follow these steps:

1) Install the BarcoMed 2MP2 adapter(s) into the machine. Refer to the hardware installation manual for more information.
2) Boot the machine, and press **"F8"** when the system displays "Starting Windows …"
3. Select **"Enable VGA Mode"**. If you do not boot in VGA mode, the system will boot normally and load the default Windows 2000 VGA Compatible Driver. This driver is not compatible with most high resolution monitors, and you may not be able to see any video output on the monitor. At this point you can either:
    a) reboot in VGA mode if you are using the 2MP2 as your VGA card or
    b) connect a VGA capable monitor and continue with the rest of the instructions.
4) Log on using an account with administrative privileges.
5) **Right click** on the **"My Computer"** Icon.
6) Select **"Manage"** from the pull down list. The Computer Management Dialog box will appear.
7) On the left side of the dialog box, Select **"Device Manager"** from "System Tools."
8) On the right side of the dialog box, click the **"+"** next to Display adapters to expand the list of adapters.
9) For each BarcoMed 2MP2 Imaging Board, two display adapters will be listed. The display adapters will be listed as "Cirrus Logic Laguna 5465" or "BarcoMed 2MP2". See Figure 7 on the next page for information on which display adapters should be used when installing the drivers.

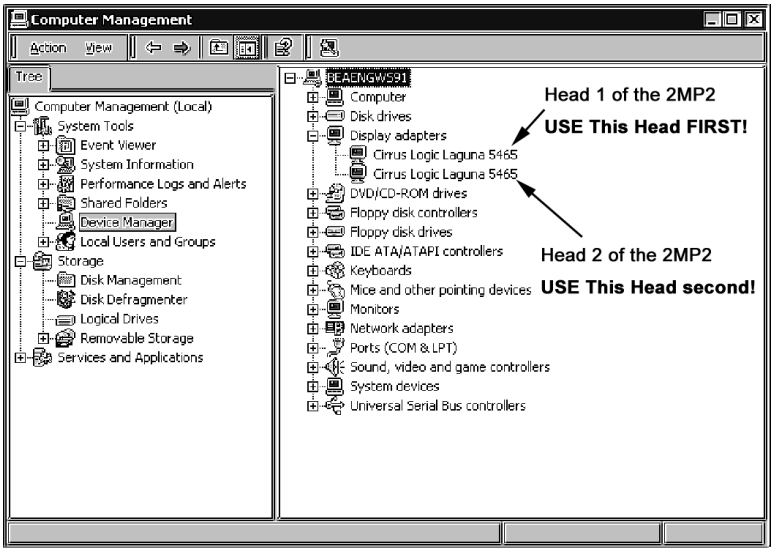


Figure 7: Windows 2000 Display Adapters Window

In the example above there was one BarcoMed 2MP2 installed in the system and NO 3rd party VGA card. The first “Cirrus Logic Laguna 5465” shown is the primary head on the BarcoMed 2MP2. Use this device first when installing the BarcoMed 2MP2 driver. The second “Cirrus Logic Laguna 5465” shown is is the secondary head on the BarcoMed 2MP2 and must be installed second.

10) Double Click on the **first display adapter** to open its properties page.

11) Select the **“Driver”** tab and click the **“Update Driver”** button. The “Upgrade Device Driver” Wizard will start. Click **“Next”** to continue.

12) Select the **“Radio Button”** beside “Display a list of the known drivers for this device so that I can choose a specific driver.” Click **“Next”**.

13) In the “Select a Device Driver” page of the wizard click “Have Disk.” Insert your driver disk or browse to the location of your driver and Click **“OK”**. Select **“2MP2”** in the “Select a Device Driver” window. Click **“Next”**.

14) An “Update Driver Warning” dialog box may appear saying:

> “Installing this device driver is not recommended because Windows cannot verify that it is compatible with your hardware. If the driver is not compatible, your hardware will

not work correctly and your computer may become unstable or stop working completely. Do you want to continue installing this driver?"

Click **"Yes"**.

15) A "Start Device Driver Installation" dialog box will appear. Click **"Next"**.

16) Windows will warn you that a digital signature was not found. Click **"Yes"** to continue the installation.

17) When the drivers are installed, click **"Finish"** on the update driver wizard and close the properties page for the device. **Do NOT reboot** your system when asked until you have installed all of the adapters associated with all of the BarcoMed 2MP2 boards installed in your system. Repeat steps 11 – 17 until you have installed all of the adapters.

Setting the resolution of your high resolution monitor

1. Reboot in **VGA Mode** and log on using an account with administrative privileges. If you do not reboot in VGA Mode Windows 2000 may select a resolution that is not compatible with your high resolution monitor and you will then need to reboot in VGA Mode.
2. To set the resolution for your monitor, open the "Display Properties Control Panel" by right clicking on the desktop, then select **"Properties"**.
3. Select the **"Settings"** tab (see Figure 8 on the next page). For each BarcoMed 2MP2 imaging board installed, there will be two rectangles representing the two heads supported by each Barco 2MP2 to select from. Select the **rectangle** that represents the first head of the BarcoMed 2MP2 Imaging Board you are working with. **SPECIAL NOTE:** If the you are using the VGA capabilities of your BarcoMed 2MP2 Imaging Board, the resolution for that board will still be set to a VGA resolution of "640 x 480" pixels. If the BarcoMed 2MP2 Imaging Board is not running VGA, the device may not be enabled yet. To enable the device check the "Extend my Windows desktop into this monitor" **checkbox**. Click the **"Apply"** button.
4. Click on the **"Advanced"** Button.
5. Select the **"Adapter"** tab and then click on the **"List All Modes…"** button. Select the resolution and refresh rate that your monitor supports from the dialog box and click **"OK"**. Click **"OK"** on the bottom of the Adapter Control Panel. If the **"OK"** button on the bottom of the Adapter Control Panel is not visible, press the **"Tab Key"** once and then press **"Enter"**.

6. Click **"OK"** in the "Windows will now apply your new desktop settings" dialog box. Your high resolution display(s) should now synchronize and display the Windows desktop.
7. Click **"Yes"** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?" Repeat steps 1 – 7 for each monitor on all the BarcoMed Imaging Boards installed in your system.
8. When you have set the resolution for all of your high resolution monitors, restart your computer and boot normally.

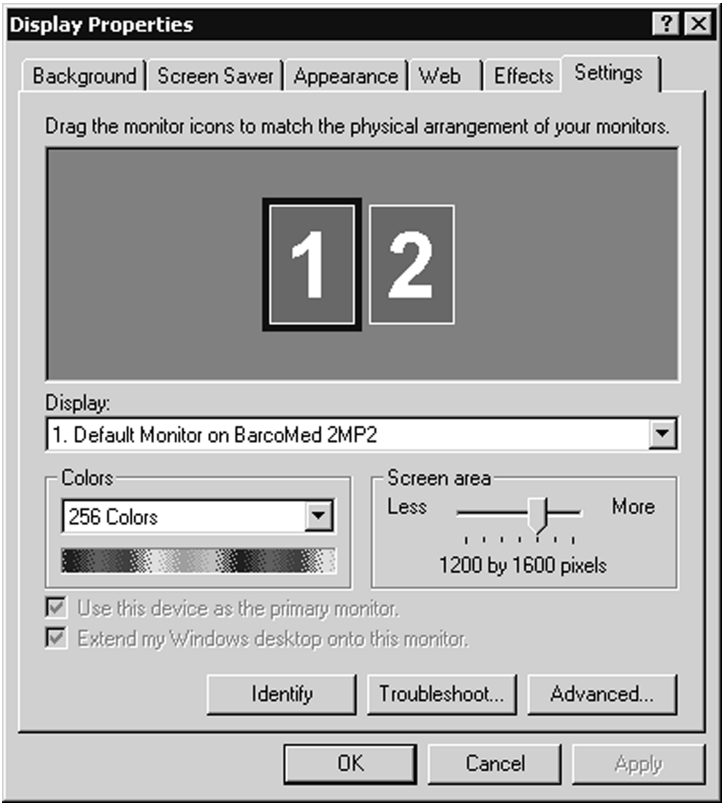


Figure 8: Windows 2000 Display Properties Window for the 2MP2 after the drivers have been installed and the resolution set.

Note: The system shown above had one 2MP2 installed and no 3rd party VGA Card. Your configuration may be different. The monitor marked "1" is the first head of the 2MP2 and the monitor marked "2" is the second head of the 2MP2.

Installing the Windows 2000 driver for the BarcoMed 2MP1NT

SPECIAL NOTE: Prior to installing the BarcoMed drivers you MUST install the BarcoMed Imaging Board(s), connect the monitor(s) to the card(s), and turn the monitor(s) on. Refer to the Hardware Installation Guide that came with your BarcoMed Imaging Board(s) for instructions on installing the BarcoMed Imaging Board(s) and connecting them to the monitor(s).

To install the BarcoMed 2MP1NT Windows 2000 Display Driver follow these steps:

1) Install the BarcoMed 2MP1NT adapter(s) into the machine. Refer to the hardware installation manual for more information.
2) Boot the machine, and press **"F8"** when the system displays "Starting Windows …"
3. Select **"Enable VGA Mode"**. If you do not boot in VGA mode, the system will boot normally and load the default Windows 2000 VGA Compatible Driver. This driver is not compatible with most high resolution monitors, and you may not be able to see any video output on the monitor. At this point you can either:
    a) reboot in VGA mode if you are using the 2MP1NT as your VGA card or
    b) connect a VGA capable monitor and continue with the rest of the instructions.
4) Log on using an account with administrative privileges.
5) **Right click** on the **"My Computer"** Icon.
6) Select **"Manage"** from the pull down list. The Computer Management Dialog box will appear.
7) On the left side of the dialog box, Select **"Device Manager"** from "System Tools."
8) On the right side of the dialog box, click the **"+"** next to Display adapters to expand the list of adapters.
9) For each BarcoMed 2MP1NT Imaging Board, two display adapters will be listed. The display adapters will be listed as "Cirrus Logic Laguna 5465" or "BarcoMed 2MP1NT". However only one display adapter is enabled on the Imaging Board itself. See Figure 9 on the next page for information on which display adapters should be used when installing the drivers.

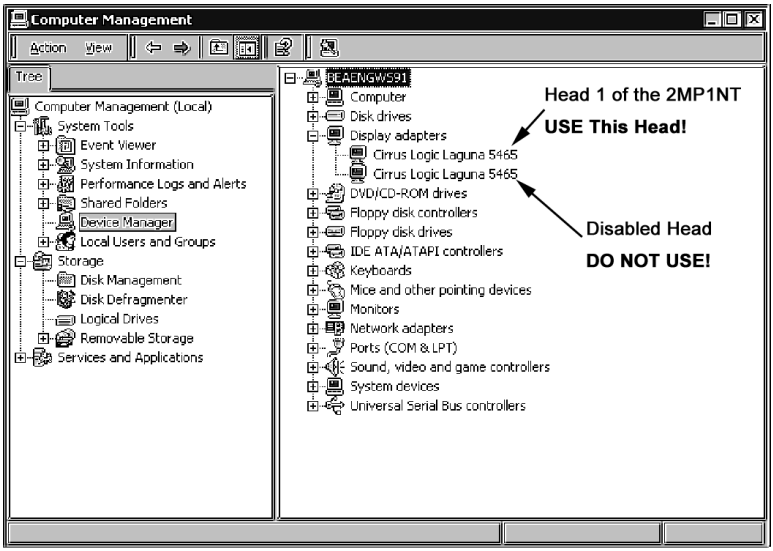


Figure 9: Windows 2000 Display Adapters Window

In the example above there was one BarcoMed 2MP1NT installed in the system and NO 3rd party VGA card. The first "Cirrus Logic Laguna 5465" shown is the functional head on the BarcoMed 2MP1NT. Use this as the device when installing the BarcoMed 2MP1NT driver. The second "Cirrus Logic Laguna 5465" shown is disabled on the BarcoMed 2MP1NT and must **NOT** be used. After installing the driver and rebooting this second device will no longer be listed under the "Display adapters" in the Computer Management Control Panel and will not be visible in the Windows 2000 Display Control Panel.

10) Double Click on the **first display adapter** to open its properties page.
11) Select the **"Driver"** tab and click the **"Update Driver"** button. The "Upgrade Device Driver" Wizard will start. Click **"Next"** to continue.
12) Select the **"Radio Button"** beside "Display a list of the known drivers for this device so that I can choose a specific driver." Click **"Next"**.
13) In the "Select a Device Driver" page of the wizard click "Have Disk." Insert your driver disk or browse to the location of your driver and Click **"OK"**. Select **"2MP1NT"** in the "Select a Device Driver" window. Click **"Next"**.

14) An “Update Driver Warning” dialog box may appear saying:

> “Installing this device driver is not recommended because Windows cannot verify that it is compatible with your hardware. If the driver is not compatible, your hardware will not work correctly and your computer may become unstable or stop working completely. Do you want to continue installing this driver?”

Click **“Yes”**.

15) A “Start Device Driver Installation” dialog box will appear. Click **“Next”**.

16) Windows will warn you that a digital signature was not found. Click **“Yes”** to continue the installation.

17) When the drivers are installed, click **“Finish”** on the update driver wizard and close the properties page for the device. If you are installing multiple BarcoMed 2MP1NT Imaging Boards in your system **reboot** your system in **VGA Mode** when asked. Repeat steps 11 – 17 until you have installed all of the adapters.

Setting the resolution of your high resolution monitor

1. Reboot in **VGA Mode** and login using an account with administrative privileges. If you do not reboot in VGA Mode Windows 2000 may select a resolution that is not compatible with your high resolution monitor and you will then need to reboot in VGA Mode.
2. To set the resolution for you monitor, open the “Display Properties Control Panel” by **right clicking** on the desktop, then select **“Properties”**.
3. Select the **“Settings”** tab (see Figure 10 on the next page). If you are using a single BarcoMed 2MP1NT and no 3rd party VGA card, there will be only a single desktop to select from. If you are using multiple 2MP1NT’s select the **rectangle** that represents the BarcoMed 2MP1NT Imaging Board you are working with.
   SPECIAL NOTE: If the you are using the VGA capabilities of your BarcoMed 2MP1NT Imaging Board, the resolution for that board will still be set to a VGA resolution of “640 x 480” pixels. If the BarcoMed 2MP1NT Imaging Board is not running VGA, the device may not be enabled yet. To enable the device check the “Extend my Windows desktop into this monitor” **checkbox**. Click the **“Apply”** button.
4. Click on the **“Advanced”** Button.
5. Select the **“Adapter”** tab and then click on the **“List All Modes…”** button. Select the resolution and refresh rate that your monitor supports from the dialog box and click **“OK”**. Click **“OK”** on the

bottom of the Adapter Control Panel. If the **"OK"** button on the bottom of the Adapter Control Panel is not visible, press the **"Tab Key"** once and then press **"Enter"**.

6. Click **"OK"** in the "Windows will now apply your new desktop settings" dialog box. Your high resolution display(s) should now synchronize and display the Windows desktop.
7. Click **"Yes"** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?" Repeat steps 1 – 6 for each monitor on all the BarcoMed Imaging Boards installed in your system. You will need to extend your desktop to each additional monitor connected to a BarcoMed 2MP1NT prior to setting its resolution.
8. When you have set the resolution for all of your high resolution monitors, restart your computer and boot normally.

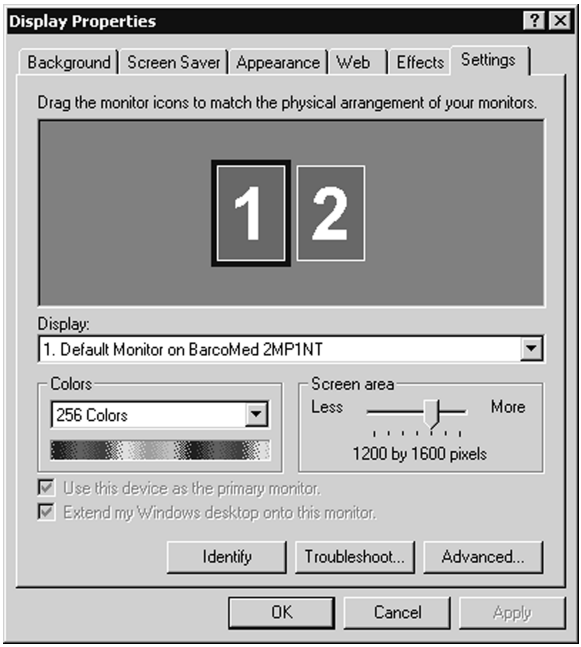


Figure 10: Windows 2000 Display Properties Settings Tab for the 2MP1NT after the divers have been installed and the resolution set.

Note: The system shown had one BarcoMed 2MP1NT imaging board installed with VGA enabled. Your configuration may be different.

Planning Your Barcomed Windows XP Installation

Because of Windows XP's Plug and Play features, it is very important to carefully plan your BarcoMed Board Hardware and Software installation and install the device drivers in the same sequence that the boards are installed in the PCI slots.

When installing BarcoMed Imaging Boards for the first time in a Windows XP System, Windows XP Plug and Play Software identifies the BarcoMed boards by the Video Chipset utilized on each boards. The Table below shows the BarcoMed Board, the Chip Set utilized by the board and the driver Windows XP Plug and Play selects for each imaging board.

BarcoMed Board Model	Chip Set Utilized	Driver Selected by Windows 2000 Plug and Play
2MP2H	BarcoView AURA	Video Controller or Video Controller (VGA Compatible)
2MP2	Cirrus Logic Laguna 5465	Cirrus Logic Laguna 5465
2MP1NT	Cirrus Logic Laguna 5465	Cirrus Logic Laguna 5465
2MP1	Imagine Number 9	Imagine Number 9 Series 128

If you have previously installed drivers for the BarcoMed Imaging Boards in your Windows XP System, Windows XP should correctly identify the board by their correct BarcoMed name. However, while updating the drivers to a new version or reinstalling the current driver Windows XP may identify the BarcoMed Imaging Boards by their Video Chipset.

If you choose to install multiple types of BarcoMed Imaging Boards in your computer it is important to carefully note which PCI slot each board is in and then install the drivers for each type of board based on the PCI slot they are installed in. **If you are using the VGA Capabilities of a BarcoMed Imaging Board it is important to install the driver for this board and set its resolution first.**

Installing the Windows XP driver for the BarcoMed 2MP2

SPECIAL NOTE: Prior to installing the BarcoMed drivers you MUST install the BarcoMed Imaging Board(s), connect the monitor(s) to the card(s), and turn the monitor(s) on. Refer to the Hardware Installation Guide that came with your BarcoMed Imaging Board(s) for instructions on installing the BarcoMed Imaging Board(s) and connecting them to the monitor(s).

To install the BarcoMed 2MP2 Windows XP Display Driver follow these steps:

1. Install the BarcoMed 2MP2 adapter(s) into the machine. Refer to the hardware installation manual for more information.
2. Boot the machine and log on using an account with administrative privileges.
3. Windows XP will automatically load the drivers for the “Cirrus Logic Laguna 5465”, the chipset used on the BarcoMed 2MP2 imaging board. To install the BarcoMed 2MP2 drivers, right click on an empty space of the desktop and select **“Properties”**.
4. Select the **“Settings”** tab (see Figure 11 on the next page). For each BarcoMed 2MP2 imaging board installed, there will be two rectangles representing the two heads supported by each Barco 2MP2 to select from. Double click on the **rectangle** that represents the first head of the BarcoMed 2MP2 Imaging Board you are working with to open its properties page.
5. Select the **“Adapter”** tab and click the **“Properties”** button. The “BarcoMed 2MP2 Properties” page will open.
6. Select the **“Driver”** tab and click the **“Update Driver...”** button. The “Hardware Update” Wizard will start.
7. Select the **“Radio Button”** beside “Install from a list or specified location (Advanced)”. Click **“Next”**.
8. On the “Please choose your search and installation options.” page of the Hardware Update Wizard, select the **“Radio Button”** beside “Don’t search, I will choose the driver to install”. Click **“Next”**.
9. In the “Select a Device Driver” page of the wizard click “Have Disk.” Insert your driver disk and select the correct device from the “Copy manufacturer’s files from” drop down menu or browse to the location of your driver and Click **“OK”**. Select **“2MP2”** in the “Select a Device Driver” window. Click **“Next”**.
10. When Windows XP has begun installing the BarcoMed 2MP2 driver it will warn you that the software “has not passed Windows

Logo testing to verify its compatibility with Windows XP." Click **"Continue Anyway"** to install the drivers.

11. When the drivers are installed, click **"Finish"** on the update driver wizard and close the properties page for the device. If you are installing multiple BarcoMed boards **you must reboot** your system when asked and set the resolution of the first monitor controlled by the first BarcoMed 2MP2. You can then install the remaining adapters associated with all of the BarcoMed 2MP2 boards installed in your system. Repeat steps 3 – 11 until you have installed all of the adapters.

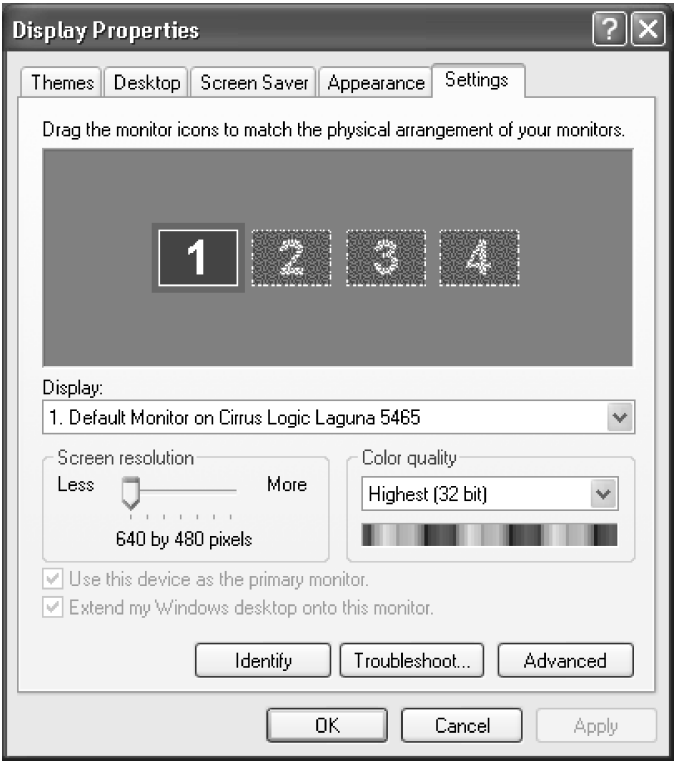


Figure 11: Windows XP Display Properties Settings Tab before the BarcoMed 2MP2 drivers have been installed.

Note: In the example above there were two BarcoMed 2MP2 installed in the system and NO 3rd party VGA card. The first rectangle, "1", shown is the primary head on the BarcoMed 2MP2. Use this device first when installing the BarcoMed 2MP2 driver. The second rectangle "2" shown is is the secondary head on the BarcoMed 2MP2 and must

be installed only after you have rebooted and set the resolution for the first head. Rectangles 3 & 4 represent the two heads on the second BarcoMed 2MP2 board.

Setting the resolution of your high resolution monitor

1) Reboot in **VGA Mode** and login using an account with administrative privileges. If you do not reboot in VGA Mode Windows XP may select a resolution that is not compatible with your high resolution monitor and you will then need to reboot in VGA Mode.
2) To set the resolution for your monitor, open the "Display Properties Control Panel" by right clicking on the desktop. Select "Properties" (see Figure 12 on the next page). For each BarcoMed 2MP2 imaging board installed, there will two rectangles representing the two heads supported by each Barco 2MP2. to select from. Select the **rectangle** that represents the first head of the BarcoMed 2MP2 Imaging Board you are working with. **SPECIAL NOTE:** If you are using the VGA capabilities of your BarcoMed 2MP2 Imaging Board, the resolution for that board will still be set to a VGA resolution of "640 x 480" pixels. If the BarcoMed 2MP2 Imaging Board is not running VGA, the device may not be enabled yet. To enable the device check the "Extend my Windows desktop into this monitor" **checkbox**. Click the **"Apply"** button.
3) Click on the **"Advanced"** Button.
4) Select the **"Adapter"** tab and then click on the **"List All Modes…"** button. Select the resolution and refresh rate that your monitor supports from the dialog box and click **"OK"**. Click **"OK"** on the bottom of the Adapter Control Panel. If the **"OK"** button on the bottom of the Adapter Control Panel is not visible, press the **"Tab Key"** once and then press **"Enter"**.
5) Click **"OK"** in the "Windows will now apply your new desktop settings" dialog box. Your high resolution display(s) should now synchronize and display the Windows desktop.
6) Click **"Yes"** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?" Repeat steps 1 – 6 for each monitor on all the BarcoMed Imaging Boards installed in your system.
7) When you have set the resolution for all of your high resolution monitors, restart your computer and boot normally.

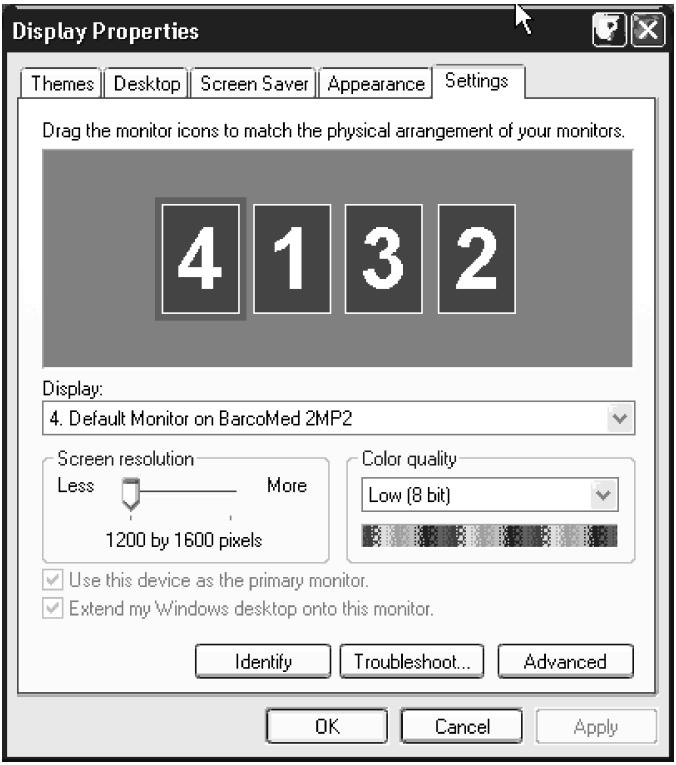


Figure 12: Windows XP Display Properties Settings Tab after the BarcoMed 2MP2 drivers have been installed and the resolution set.

Note: The system shown above had two 2MP2s installed and no 3rd party VGA Card. Your configuration may be different.

Installing the Windows XP driver for the BarcoMed 2MP1NT

SPECIAL NOTE: Prior to installing the BarcoMed drivers you MUST install the BarcoMed Imaging Board(s), connect the monitor(s) to the card(s), and turn the monitor(s) on. Refer to the Hardware Installation Guide that came with your BarcoMed Imaging Board(s) for instructions on installing the BarcoMed Imaging Board(s) and connecting them to the monitor(s).

To install the BarcoMed 2MP1NT Windows XP Display Driver follow these steps:

1. Install the BarcoMed 2MP1NT adapter(s) into the machine. Refer to the hardware installation manual for more information.
2. Boot the machine and log on using an account with administrative privileges.
3. Windows XP will automatically load the drivers for the “Cirrus Logic Laguna 5465”, the chipset used on the BarcoMed 2MP1NT imaging board. To install the BarcoMed 2MP1NT drivers, right click on the desktop and select **“Properties”**.
4. Select the **“Settings”** tab (see Figure 13 on the next page). For each BarcoMed 2MP1NT imaging board installed, there will two rectangles representing the two display adapters installed on each Barco 2MP1NT. However only one display adapter is enabled. Double click on the **rectangle** that represents the first display adapter of the BarcoMed 2MP1NT Imaging Board you are working with to open its properties page.
5. Select the **“Adapter”** tab and click the **“Properties”** button. The “BarcoMed 2MP1NT Properties” page will open.
6. Select the **“Driver”** tab and click the **“Update Driver...”** button. The “Hardware Update” Wizard will start.
7. Select the **“Radio Button”** beside “Install from a list or specified location (Advanced)”. Click **“Next”**.
8. On the “Please choose your search and installation options.” page of the Hardware Update Wizard, select the **“Radio Button”** beside “Don’t search, I will choose the driver to install”. Click **“Next”**.
9. In the “Select a Device Driver” page of the wizard click “Have Disk.” Insert your driver disk and select the correct device from the “Copy manufacturer’s files from” drop down menu or browse to the location of your driver and Click **“OK”**. Select **“2MP1NT”** in the “Select a Device Driver” window. Click **“Next”**.
10. When Windows XP has begun installing the BarcoMed 2MP1NT driver it will warn you that the software “has not passed Windows

Logo testing to verify its compatibility with Windows XP." Click **"Continue Anyway"** to install the drivers.

11. When the drivers are installed, click **"Finish"** on the update driver wizard and close the properties page for the device. If you are installing multiple BarcoMed 2MP1NT Imaging Boards in your system **reboot** your system in **VGA Mode** when asked. Repeat steps 3 – 11 until you have installed all of the adapters.

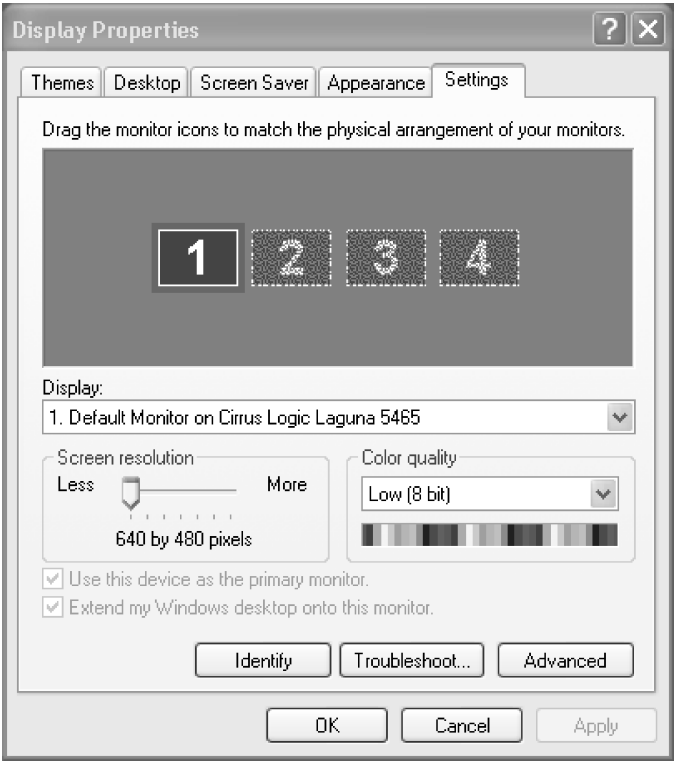


Figure 13: Windows XP Display Properties Setting Tab before the Barcomed 2MP1NT drivers have been installed.

Note: The system above has two BarcoMed 2MP1NT installed and NO 3rd party VGA card. The first rectangle, "1", shown is the primary head on the first BarcoMed 2MP1NT. Use this device first when installing the BarcoMed 2MP1NTdriver. The second rectangle, "2", shown is disabled on the BarcoMed 2MP1NT and must **NOT** be used. After installing the driver and rebooting this second device will not be visible in the Windows XP Display Control Panel and will no longer be listed under the "Display adapters" in the Computer Management

Control Panel. Rectangles “3” and “4” represent the primary and disabled heads on the second BarcoMed 2MP1NT installed in this system. Your configuration may be different.

Setting the resolution of your high resolution monitor

1. Reboot in **VGA Mode** and log on using an account with administrative privileges. If you do not reboot in VGA Mode Windows XP may select a resolution that is not compatible with your high resolution monitor and you will then need to reboot in VGA Mode.
2. To set the resolution for you monitor, **right click** on an empty space of the desktop and select **“Properties”**.
3. Select the **“Settings”** tab (see Figure 14 on the next page). If you are using a single BarcoMed 2MP1NT and no 3rd party VGA card, there will be only a single desktop to select from. If you are using multiple 2MP1NT’s select the **rectangle** that represents the BarcoMed 2MP1NT Imaging Board you are working with. **SPECIAL NOTE:** If the you are using the VGA capabilities of your BarcoMed 2MP1NT Imaging Board, the resolution for that board will still be set to a VGA resolution of “640 x 480” pixels. If the BarcoMed 2MP1NT Imaging Board is not running VGA, the device may not be enabled yet. To enable the device check the “Extend my Windows desktop into this monitor” **checkbox**. Click the **“Apply”** button.
4. Click on the **“Advanced”** Button.
5. Select the **“Adapter”** tab and then click on the **“List All Modes…”** button. Select the resolution and refresh rate that your monitor supports from the dialog box and click **“OK”**. Click **“OK”** on the bottom of the Adapter Control Panel. If the **“OK”** button on the bottom of the Adapter Control Panel is not visible, press the **“Tab Key”** once and then press **“Enter”**.
6. Click **“OK”** in the “Windows will now apply your new desktop settings” dialog box. Your high resolution display(s) should now synchronize and display the Windows desktop.
7. Click **“Yes”** when asked, “Your desktop has been reconfigured. Do you want to keep these settings?” Repeat steps 1 – 7 for each monitor on all the BarcoMed Imaging Boards installed in your system. You will need to extend your desktop to each additional monitor connected to a BarcoMed 2MP1NT prior to setting its resolution.
8. When you have set the resolution for all of your high resolution monitors, restart your computer and boot normally.

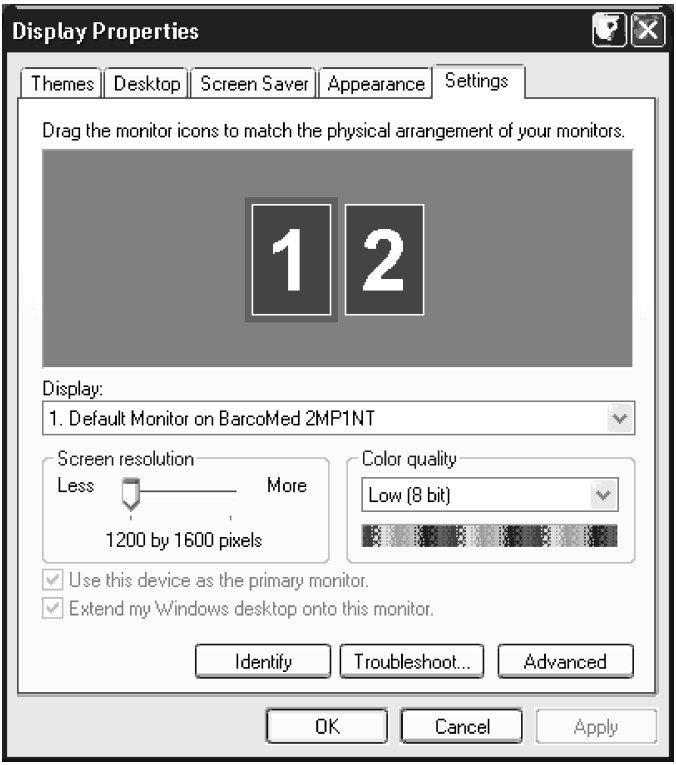


Figure 14: Windows XP Display Properties Settings Tab after the BarcoMed 2MP1NT drivers have been installed and the resolution set.

Note: The system shown above has one BarcoMed 2MP1NT Imaging Board installed with VGA enabled. Your configuration may be different.

BARCO METHEUS CONFIGURATION TAB

Introduction

After the BarcoMed 2MP Windows Display Driver is installed, a new Display Properties tab is available for configuring special features of the BarcoMed 2MP board. Please note that you must have logged on to Windows using an account with administrator privileges in order to use the BARCO Metheus Control Panel to change any display settings.

1) Open the “Display Properties Control Panel” by right clicking on the desktop, then select “Properties”..
2) Under Windows NT 4.0, Click on the “BARCO Metheus Configuration” Tab. (see figure 15, below).

   Under Windows 2000, click on “Settings” tab. Double click on the rectangle that represents the BarcoMed 2MP to bring up its property page. Click on the “BARCO Metheus Configuration” tab (see figure 16, on the next page).

   Under Windows XP, click on “Settings” tab. Double click on the rectangle that represents the BarcoMed 2MP to bring up its property page. Click on the “BARCO Metheus Configuration” tab (see figure 17, on the next page).

Figure 15: Configuration Tab under Windows NT 4.0

Figure 16: Configuration Tab under Windows 2000

Figure 17: Configuration Tab under Windows XP

Status

Displays the current BarcoMed Imaging Board, driver, and the currently selected display resolution.

Graphics Board

This displays the current BarcoMed Imaging Board.

Driver Version

This displays the current BarcoMed driver version.

Resolution

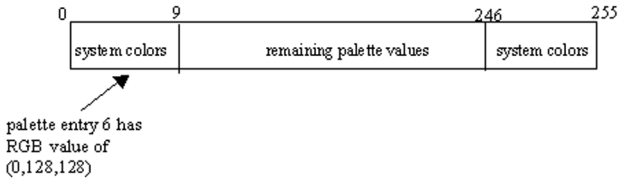
This displays the currently selected display resolution.

Palette Mode

You can choose one of the following Palette Modes:

UserModifiable Color Palette

This option allows applications to modify the palette contents dynamically. As indicated by the picture below, this mode reserves the first 10 and last 10 entries in the palette for the Windows operating system, but applications can manipulate the middle 236 entries. This is the standard palette mode as configured by Windows.

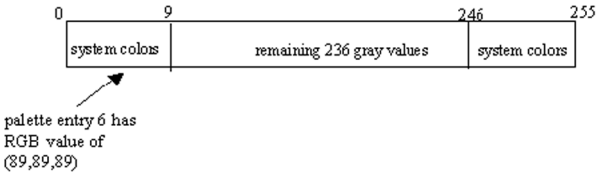


Static Gray Palette including standard system colors

This option sets the palette to be a static set of 256 gray values. Therefore, applications are denied the ability to dynamically change or allocate palette entries. This prevents palette conflicts between applications, which can cause image color values to appear distorted in the background application.

As shown in the next picture, the 20 standard system colors are converted from RGB to gray values. The rest of the 236 entries from

index 10 to 245 contain the missing gray values so that the palette has the full 256 gray values within it.

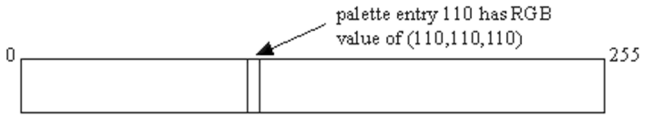


Please note that dithering is not permitted while in this mode. The Enable Dithering check box will be grayed-out, and dithering will be automatically disabled regardless of whether this check box is checked. This complies with the Windows standard interface method. If you are unsure whether or not your application requires this “Static Gray Palette including Standard System Colors” mode, contact your application provider.

Static Gray Palette with NO system colors

This option sets the palette to be a static linear ramp of 256 shades of gray. Therefore, applications are denied the ability to dynamically change or allocate palette entries. This prevents palette conflicts between applications, which can cause image color values to appear distorted in the background application.

As shown in the picture below, each of the 256 entries in the palette has an RGB value of (i, i, i) where i is the index from 0 to 255.



If you wish to use a static gray palette we recommend using the “Static Gray Palette including Standard System Colors” option instead of this one. This is due to the fact that some applications assume that the first and last 10 entries of the palette are the standard system colors. In this palette mode, these entries are made up from entries in the bottom or the top of the gray ramp. Please note that dithering is not permitted while in this mode. The Enable Dithering check box will be grayed-out, and dithering will be automatically disabled regardless of whether this check box is checked. This complies with the Windows standard interface method. If you are unsure whether or not

your application requires this “Static Gray Palette with NO System colors” mode, contact your application provider.

Drawing Modes

You can choose one or both of the following Drawing Modes:

Enable DirectDraw

This option allows the user to enable or disable DirectDraw. DirectDraw is a software interface that provides direct access to display devices while maintaining compatibility with the Windows graphics device interface (GDI). DirectDraw provides a device-independent way for applications to gain access to the hardware features of specific display devices. If you enable DirectDraw, your application will have the choice of using DirectDraw or GDI. If you disable DirectDraw, your application will use GDI instead of DirectDraw. Please note that in any case, your application can always use BarcoMed driver functions (i.e. WinBarco) or other graphics extensions (such as OpenGL).

Enable Dithering

This option allows the user to enable or disable dithering. Dithering is a technique for increasing the perceived range of colors in an image at the cost of spatial resolution. Adjacent pixels are assigned differing color values; when viewed from a distance, these colors seem to blend into a single intermediate color. The technique is similar to the half-toning used in black-and-white publications to achieve shades of gray. Please note that this option is only available when the User Modifiable Palette Mode is selected. This is because dithering is only supported under Windows when the display is palletized. If either the “Static Gray Palette including Standard System Colors” mode or the “Static Gray Palette with NO System colors” mode is selected, the “Enable Dithering” check box will be grayed-out, and dithering will be automatically disabled regardless of whether this check box is checked. This complies with the Windows standard interface method.

Monitor Configuration

This option allows you to select the number of monitors that the current display boards should drive, as well as how the monitors should be positioned. For example, if the current board installation is capable of driving four heads, but you only have three monitors which are placed in a single row, then you can select the “Three monitors –

one row” option from the pull-down list. This would cause the Windows virtual desktop to be resized to fit on the three monitors, and you can move your cursor horizontally from one screen to the other.

If “Custom Configuration” is displayed, it means that the current monitor configuration was set via the registry and it doesn’t agree with any of the configurations that the display control panel supports. Contact Barco Medical Imaging Systems for further information.

Languages supported

The Barco Metheus Configuration Tab supports the following languages:

English (U.S) (default)
Dutch
German
Korean
Japanese
Simplified Chinese
Traditional Chinese

To change between the languages select the correct region via the Regional Settings Control Panel in your machine’s Start > Settings > Control Panel.

BARCO METHEUS HARDWARE CONFIGURATION TAB

Introduction

The BARCO Metheus Hardware Configuration Tab is used for gathering information about BarcoMed imaging boards. For all BarcoMed imaging boards it will display PCI information. In addition for BarcoMed imaging boards based on the AURA video chipset it will also display information about the Firmware installed on the board.

BarcoMed Board Types		
AURA Boards	**Non-AURA Boards**	**BARCO Metheus Hardware Configuration Tab Support**
2MP2H		PCI and Firmware Information
3MP2FH		PCI and Firmware Information
5MP2AURA		PCI and Firmware Information
	2MP1	PCI Information Only
	2MP1NT	PCI Information Only
	2MP2	PCI Information Only
	4MP2	PCI Information Only
	5MP1H	PCI Information Only
	5MP2	PCI Information Only

To access the BARCO Metheus Hardware Configuration Tab do the following:

1. Open the “Display Properties Control Panel” by right clicking on the desktop, then select “Properties”.
2. Under Windows NT 4.0, Click on the “BARCO Metheus Hardware Configuration” Tab. (see figure 18, below).

   Under Windows XP and Windows 2000, click on the “Settings” tab. Double click on the rectangle that represents the BarcoMed 2MP2H to bring up its property page. Click on the “BARCO Metheus Hardware Configuration” tab (see figure 19, on the next page).

Figure 18: BARCO Metheus Hardware Configuration Tab under Windows NT 4.0

Figure 19: BARCO Metheus Hardware Configuration Tab under Windows 2000 and Windows XP

Using The BARCO Metheus Hardware Configuration Tab

Device

Displays the current BarcoMed Imaging Board, driver, and the currently selected display resolution.

Identify Device: This button is for BarcoView Metheus internal use only and is greyed out.

PCI Information

Device ID: Displays the device's PCI Device ID number.

Vendor ID: Displays the device manufacturer's PCI Vendor ID number.

Subsystem ID: Displays the device's PCI Subsystem ID number.

SubsystemVendorID: Displays the device's PCI Subsystem Vendor ID number.

VGA Status: Displays whether the VGA capabilities of the BarcoMed board are enabled or disabled.

Firmware Information

Product Name: Displays the name of the BarcoMed imaging board installed in the selected PCI slot.

Serial Number: Displays the serial number of the BarcoMed imaging board installed in the selected PCI slot.

VGA Bios Version: Displays the VGA Bios version for the BarcoMed imaging board installed in the selected PCI slot.

Firmware Version: Displays the firmware version for the BarcoMed imaging board installed in the selected PCI slot.

Hardware Version: Displays the Hardware Version for the BarcoMed imaging board installed in the selected PCI slot.

"Advanced ..." Button: By clicking on this button, the user can display more information about the BarcoMed imaging board installed in the selected PCI slot.

"Generate Report" Button: Clicking this button will produce two reports. It will first run the Windows Diagnostics program which will generate a report that is saved to a text file. For Windows XP and Windows 2000, this file will be saved on the c:\ drive and it will be named BarcoMetheusReport.txt. For Windows NT 4.0, this file will be saved on the desktop and it will have the same name as the machine for which the report is being generated. The other report that is generated contains information about the Barco display adapters installed in the system and will be named BarcoMedDeviceInfo.txt. This report will be saved on the desktop. These files can be emailed to our customer support department when reporting a problem. To locate the closest BarcoView Support office, see the Support section on www.barcomedical.com. If your system is connected to the internet and a web browser is installed you can click on the link at the top of the BARCO Metheus Hardware Configuration Tab to get to our web site.

“Update Device...” Button: Clicking this button will run the BarcoMed Hardware Configuration Wizard. This program allows the user to flash update the firmware stored in the ROM of the currently selected BarcoMed imaging board. The BarcoMed Hardware Configuration Wizard is a “wizard style” application that uses dialog boxes to guide the user through the flash update procedure. The user will be prompted to select a firmware update file to use for the update therefore you will need a firmware update file for your specific BarcoMed imaging board in order to update it’s firmware. This file will be provided by BarcoView if and when a firmware update is required.

Special Note: The BarcoMed Hardware Configuration Wizard is applicable only for AURA-based imaging boards.

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BARCO METHEUS DPMS OVERVIEW

Introduction

The Barco Metheus DPMS (Display Power Management Signaling) Screen Saver allows the user to set power and monitor saving features for medical monitors driven by BarcoMed Imaging Boards. At the end of the workday, the monitor will enter certain DPMS states as requested by the imaging board. This is accomplished through standardized signals between the monitor and imaging board.

The default DPMS state is the Off state. In addition to simply entering the Off state after the work day, the user can specify that the monitor first go through two other DPMS states before going into Off state. These two other states are Stand-By and Suspend. The user can specify how much time should be spent in each state in the “Amount of Time in each DPMS Power State” section.

A valuable feature of the Barco Metheus DPMS Screen Saver is that it will automatically ensure that CRT based monitors are warmed up for the start of the work day. All CRT based monitors require some warm-up time before they are at full performance.

On Barco CORONIS displays, the I-GUARD will stabilize the image within a few seconds after the monitor returns to the active state, thus eliminating the need for a warm-up period at the beginning of the workday.

On CRT based monitors, such as the Barco MGD series, a “regular” screen saver can be invoked during user inactivity during the workday. This “regular” screen saver and its settings can be chosen from the “Screen Saver During Work Day” section. We recommend using an all black screen saver, such as the “Barco Metheus Blank Screen” saver, for the longest phosphor life.

On LCD based monitors, such as the Barco CORONIS displays, it is not necessary to invoke a screen saver as there is no CRT phosphor to preserve. However, one can extend the life of the backlight in the LCD monitor, in addition to realizing great power savings, during period of user inactivity by using DPMS to quickly enter the Off state. We recommend setting the work day to be as short as possible to get the maximum power savings on CORONIS displays.

The Barco Metheus DPMS Screen Saver can also be used when no one is logged on.

BarcoMetheus DPMS Screen Saver Options

From the “Barco Metheus DPMS Screen Saver Control Panel” you can change many DPMS screen saver elements simultaneously. The DPMS screen saver elements in each scheme are work schedule, work day screen saver, DPMS settings after workday, and many additional options.

Current Scheme

Lists the three “DEFAULT” schemes which you can use as they are. Or you can modify them to meet your office’s schedule.

Save As

Saves your current Barco Metheus DPMS Screen Saver settings. The name you specify will appear in the Scheme list so you can easily restore these settings later.

Delete

Deletes the scheme that is selected in the Scheme box.

Work Schedule

Select the begin and end times for each workday. If the system is not expected to be used, leave both start and end workday times as the same time.

Begin Work Day

The “Begin Work Day” time is the time after which the system is expected to start being used. During the workday, the screen saver selected by the user in the “Screen Saver During Work Day” section is used during user inactivity.

End Work Day

The “End Work Day” time is the time after which the system is not expected to be used any more for that day. After the workday, the display is set to one of the DPMS states (Stand-By, Suspend, or Off) by the imaging board during user inactivity.

Screen Saver During Work Day

On CRT based monitors, such as the Barco MGD series, a “regular” screen saver can be invoked during user inactivity during the

workday. This “regular” screen saver and its settings can be chosen from the “Screen Saver During Work Day” section. We recommend using an all black screen saver, such as the “Barco Metheus Blank Screen” saver, for the longest phosphor life.

On LCD based monitors, such as the Barco CORONIS displays, it is not necessary to invoke a screen saver as there is no CRT phosphor to preserve. However, one can extend the life of the backlight in the LCD monitor, in addition to realizing great power savings, during period of user inactivity by quickly entering the Off state. We recommend setting the work day to be as short as possible to get the maximum power savings on CORONIS displays.

Available Savers

Lists the available screen savers.

Settings

Changes settings for the selected screen saver.

DPMS Settings After Work Day

If you have an imaging board that supports DPMS calls, then you will be able to set the DPMS Settings for after the work day. Otherwise, a text box will be displayed tell you why DPMS functions are not available.

Amount of Time in each DPMS State

After the workday, the monitor will be placed into one of the following DPMS Power States: Stand-By, Suspend, or Off. The default setting is for the monitor to directly go into the Off State and spend no time in the Stand-By or Suspend states. If the user wishes to go into the Stand-By or Suspend states before going into the Off state, select the required amount of time for each state.

If requested, the monitor will first go into Stand-By state, then into Suspend state, and then into Off state. The properties of DPMS states are listed in the following table:

DPMS State	Power Savings	Monitor Recovery Time
On	None	N/A
Stand-by	Minimal	Short
Suspend	Substantial	Longer
Off	Maximum	Longest

Monitor Settings

Select the amount of time the monitor requires to warm-up. Since all CRT based monitors require some warm-up time before they are at full performance, this ensures that the monitor is ready for use at the beginning of the workday.

If you have a Barco Medical Monitor, select “Barco Quick Start.” If a non-Barco monitor is being used, select the amount of time it takes your monitor to warm up via the “Monitor Setting” section. Contact your monitor vendor for this warm-up time.

On Barco CORONIS displays, the I-GUARD will stabilize the image within a few seconds after the monitor returns to the active state so there is no need for a warm-up time period.

Use As Logon Screen Saver

Check the box to use the Barco Metheus DPMS Screen Saver when no one is logged into the system.

Uncheck the box to use the default screen saver when no one is logged into the system.

Installing the BarcoMetheus DPMS Screen Saver

To install the DPMS Screen Saver, you must have the Microsoft Windows Installer program installed on your system. To verify that it is installed use Windows Explorer to search for the following file: **“msiexec.exe**”. If you do not find this file, you can install it from the BarcoMed Software CD by following the steps below. If the Windows Installer is installed on your system skip to step 6 below.

1. Insert the BarcoMed Software CD in your system’s CD drive.

2. Use Windows Explorer to navigate to the following folder: **[CD drive]:\DPMS_ScreenSaver**\:
   On Windows NT 4.0 systems install the Windows Installer by double clicking on the file **"instmsiw.exe**".
   On Windows 2000 and Windows XP systems install the Windows Installer by double clicking on the file **"instmsia.exe**".
3. Restart your system if prompted to do so.
4. Now install the DPMS Screen Saver by double clicking on the file:
5. **"[CD drive]:\DPMS_ScreenSaver\setup.exe**". This will launch the Windows Installer which will guide you through the DPMS install process. Click **"Next"** to continue.
6. The "Customer Information" page will appear. The Installer will automatically fill in the blanks using the information entered when Windows was installed on your system. You may change this information if you wish. We recommend that you install DPMS for all users of the computer. Click **"Next"** to continue.
7. The "Setup Type" page will now appear. Choose **"Typical"** to install the default schemes with English names. Choose **"Custom"** to install the default schemes with either Dutch or German names. Currently the default schemes are not supported in the Japanese, Korean and Chinese languages. W e recommend that the users of these three languages install the English default schemes and then rename and save them into their language in the DPMS configuration screen. Click **"Next"** to continue.
8. The "Ready to Install Program" page will now appear, click **"Install"** to install DPMS.
9. When the Windows Installer has finished installing DPMS, the "Installshield Wizard Completed" page will appear, click **"Finish"** to exit the program.

Getting started with the BarcoMetheus DPMS Screen Saver

The easiest way to get started is to select an existing Scheme and then modify it with your preferences. Schemes are separated into two kinds, DEFAULT (global) and PRIVATE (personal).

Upon installation, three default schemes are installed and no private schemes are installed.

Default schemes are visible to all users of the system. However, they can be modified only by users with administrator privileges. If a user who does not have administrator privileges tries to save a scheme using an existing default scheme name, an error message is

displayed saying “you must have administrator rights to modify a default scheme.” If an administrator saves a scheme using an existing default scheme name, a message is displayed to tell the user that the modification is saved to a default scheme and will be visible to all users. If the administrator saves a scheme using a new name, then the user is asked if the scheme should be saved as a default scheme or a private scheme. Since there is no distinction between how a default scheme and a private scheme is displayed, it is highly recommended that the user use a different naming convention to distinguish the two (i.e. use “DEFAULT: ...” for default schemes).

Private schemes are shared and visible to all users of the system. Users who do not have administrator privileges can create, modify or delete private schemes. However, only the user who created them can modify or delete them. When the delete button is pressed, the user is asked to confirm the delete request.

Using the BarcoMetheus DPMS Screen Saver

To set up the Barco Metheus DPMS Screen Saver using one of the three default schemes, please do the following:

1. Open the “Display Properties Control Panel” by right clicking on an empty space of the desktop and then select the **“Screen Saver”** tab. (See figures 20, 21 and 22.)
2. Select the **“BarcoMetheus DPMS Screen Saver”** in the “Screen Saver” drop down menu if it is not already selected.
3. Click on the **“Settings”** button. The “Barco Metheus DPMS Screen Saver Control Panel” will open. (See figure 23.)
4. Use the default schemes by selecting one of the three default schemes. Click **“OK”**. Then Click **“OK”** again.

   Note: If you make any changes to any of the settings of one of the three default schemes, the Current Scheme field will blank and you MUST SAVE your changes by clicking on the **“Save As ...”** button. When you click on the **“Save As ...”** button, the name of the last scheme you used will be automatically displayed, you can then choose to use that scheme name or enter a new name. After the you have saved the scheme, then click OK and the new scheme will be in effect.

Figure 20: Windows NT 4.0 Screen Saver Tab

Figure 21: Windows 2000 Screen Saver Tab

Figure 22: Windows XP Screen Saver Tab

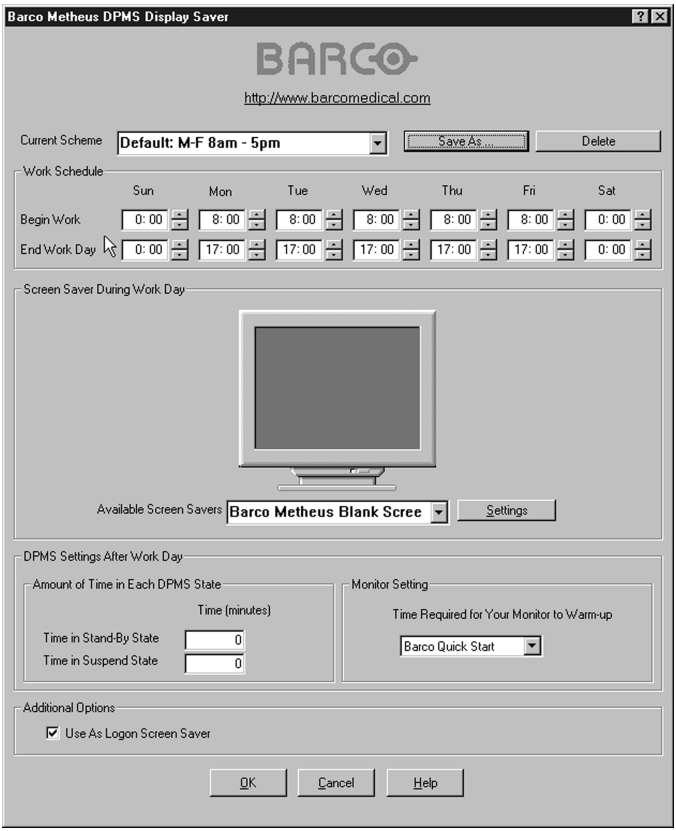

Figure 23: Barco Metheus DPMS Setting Control Panel

To create a new scheme by modifying one of the three default schemes please do the following.

1. Open the “Display Properties Control Panel” by right clicking on the desktop and then select the **“Screen Saver”** tab.
2. Select the **“BarcoMetheus DPMS Screen Saver”** in the “Screen Saver” drop down menu if it is not already selected.
3. Click on the **“Settings”** button. The “Barco Metheus DPMS Screen Saver Control Panel” will open.
4. Select one of the default schemes from the “Current Scheme” drop down menu.

5. Set the Work Schedule by setting the beginning and ending time of your workday for each day of the week.
6. Select the screen saver you wish use during the workday in the “Screen Saver During Work Day” section.
7. Select the amount of time you wish to spend in the Stand-By and Suspend states after the workday has ended. Please note that after the time specified has elapsed when you are in Stand-By or Suspend, you will automatically go into the Off state.
8. Select the amount of time it takes for your monitor to warm up. If you have a Barco Medical Monitor, select **“Barco Quick Start”**. If you are using a non-Barco monitor, select the amount of time it takes your monitor to warm up via the “Monitor Setting” section. Contact your monitor vendor for this warm-up time. On Barco CORONIS displays, the I-GUARD will stabilize the image within a few seconds after the monitor returns to the active state, thus eliminating the need for a warm-up period at the beginning of the workday.
9. If you wish to use this DPMS screen saver as the screen saver at logon time, check the **“Use As Logon Screen Saver”** box in the “Additional Options” section.
10. Save your preferences by pressing the **“Save As”** button and entering a new profile name in the **“Save Profile Setting”** dialog box.
11. Apply your new scheme by clicking **“OK”.**
12. Click **“OK”** again to close the “Display Properties Control Panel”.

Uninstalling DPMS

To remove DPMS screen saver from your system do the following:

For Windows NT 4.0 Systems

1. Launch the Windows Control Panel.
2. Then double click the **“Add/Remove Programs Icon”**.
3. Highlight **“DPMS Screen Saver”** in the Dialog Box. Click the **“Add/Remove”** button.
4. The Windows Installer will ask if you are sure you want to remove this program, click **“Yes”**.
5. When the Windows Installer has finished removing the program, click **“OK”** to exit the Add/Remove Program Properties dialog box.
6. Close the “Control Panel” window.

For Windows 2000 and Windows XP Systems

1. Launch the Windows Control Panel.
2. Then double click the on **“Add/Remove Programs”**.
3. Highlight **“DPMS Screen Saver”** in the “Currently Installed Programs” window. Click the **“Change/Remove”** button.
4. The Windows Installer will ask if you are sure you want to remove this program, click **“Yes”**.
5. When the Windows Installer has finished removing the program, click **“Close”** to exit the Add/Remove Program Control Panel.
6. Close the “Control Panel” window.

MEDICAL SOFTWARE INSTALLATION AND USAGE

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MEDICAL SOFTWARE INSTALLATION

Install MediCal on the PC. Follow the instructions from the MediCal User Guide.

Important: Do not forget you have to have Administrator privileges to install or uninstall MediCal.

OPTICAL SENSOR CONNECTION

If you are using an X-Rite DTP92 sensor for conformity calibration and consistency check, connect the sensor to one of the display's **Sensor** plugs or to a free PC COM port.

USING MEDICAL

You can now use MediCal to configure the complete configuration and set up the Q/A tasks.

Proceed as follows:

1 Start MediCal. If appropriate, you can connect to MediCal Administrator.
2 Set up the configuration in MediCal by using the **Configuration Setup** wizard.
3 If necessary, align the displays' geometry settings.
4 For all the displays in the system, check if the DPMS setting is turned on. Therefore, right-click on the display icon and select **Properties...** from the drop-down menu. Then click on **Details...**
Check if the **Powersave** option is checked. If not, check it. This is necessary to use the DPMS possibilities of the imaging board.
5 For all the displays in the system, define (if necessary) and select a Preset.
6 After selecting the Preset, MediCal starts consistency calibration automatically.
7 Define the Q/A task schedule.
8 Run the due tasks.

Please refer to the MediCal User Guide for more information.

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DISPLAY USER MANUAL

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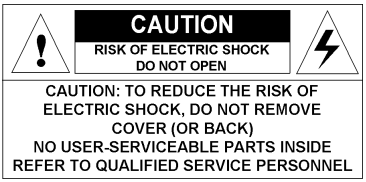
Trademark information

TrueGrey, MediCal, BarcoMed, and MeDis are registered trademarks of BARCO NV.

Windows NT is a registered trademark of Microsoft Corporation.

SAFETY INSTRUCTIONS



Regulations

• This apparatus conforms to: IEC601-1, UL2601-1, cUL2601-1, EN 60601-1

• This apparatus is classified as Type B without Applied Part.

Usage in Hazardous locations

• Class I equipment

• Equipment **not** suitable for use in the presence of a **flammable anaesthetic mixture with air** or **with oxygen** or **nitrous oxyde.**

FCC notice

This equipment has been tested and found to comply with the limits of a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Power connection

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

• **Warning:** This apparatus must be earthed!

• Power requirements: connect the apparatus to an AC voltage as indicated at its back. Using a lower voltage, the apparatus will not be able to operate. Using a higher voltage may damage the apparatus.
If you are not sure of the type of power supplied, consult the power company.

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

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

• Read the safety and operating instructions before operating the apparatus.

• Retain safety and operating instructions for future reference.

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

• Follow all instructions for operation and use.

Water and moisture

• Never expose the apparatus to rain or moisture.

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

Ventilation

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

Installation

• Place the apparatus on a flat, solid and stable surface that can bear the weight of at least 3 monitors. If you use an unstable cart or stand, the set may fall, causing serious injury to a child or adult, and serious damage to the equipment.
More warnings in the Installation chapter.

INTRODUCTION

Overview

Resolution and bandwidths

The BARCO MGD 221 is a high resolution, greyscale portrait display. Its outstanding visual performance, combining a 2 MegaPixel resolution with a high brightness, makes it ideal for medical imaging and many other medical and scientific applications.

The MGD 221 is compatible with any AC power system worldwide and automatically synchronizes to a wide range of sync frequencies. Its high-speed video amplifier supports pixel clocks up to 250 MHz.

The memory system

The internal memory system can contain the adjustments for 8 different scanning formats, the so-called scanning modes. Each scanning format is characterized by its sync signals. The display's internal micro controller continuously samples the connected sync signals and compares them to the scanning modes already stored in the memory. If the connected signal has already been stored, the micro controller adapts the image to the corresponding adjustment values in the memory, and further adjustments are unnecessary.

Image conformity and consistency

Image conformity and consistency are the keywords. In our factory, the MGD 221 displays are perfectly adjusted and calibrated before they are shipped to the customer. Internal circuits, like the TrueGrey® and Automatic White Stability (AWS) systems, ensure display consistency over time.

Conformity with the original image quality is guaranteed by the automatic calibration, which can be done by means of an optical sensor, connected to the Sensor connector on the display. The sensor is not supplied with the display.

Calibration and adjustments

The conformity calibration, as well as the complete adjustment of the display, can be performed by means of the remote, user-friendly MediCal® software package. MediCal, is especially developed to adjust and check BARCO's medical displays.

A lot of adjustments can also be done on the monitor itself, by means of an extensive on-screen menu system, accessible from the rear panel controls.

Power saving system

The MGD 221 is equipped with a power saving system.
When left idle for a certain time, the computer, connected to the display, will power down the display in several steps. The power saving system can be switched on or off during the installation or adjustment of the display.
This system requires a computer imaging board that supports power saving management.

Versions and options

The MGD 221 comes in 2 different versions: With an anti-reflective panel in front of the picture tube, and without panel (No Panel version).

In both cases, the phosphor is a B4-L8 type.

The type of CRT phosphor and the presence of the coating are indicated on the label at the rear of the display.

The video input is terminated to 75 Ohm.

Important: It is absolutely necessary that the impedances of imaging board and display are the same. If not, the image quality will be inferior.

The MGD 221 can be delivered with the following options: Southern Hemisphere Compensation and Ambient Light Compensation (ALC).

The MediCal software and the X-Rite DTP92 sensor are not delivered with the display.

MediCal can be ordered separately.

About the manuals

This guide is meant for people who want to install and use the MGD 221 display, as well as people who need to install and adjust the display. The chapter "Advanced Adjustments" is meant for trained engineers only, because it describes actions and procedures that require a technical skill to be performed properly.

The use of the software MediCal is described in the MediCal User’s Manual.

INSTALLATION

Precautions

- Keep your original packaging. It is designed for this display and is the ideal protection during transport.
- Do not lift the display all by yourself to avoid injury.
- Avoid reflections in the picture tube to reduce eye strain.
- Place the display on a strong and stable table or desk if used as desktop display.
- Keep the display away from heat sources and provide enough ventilation in case it is built in a rack or console.
- Keep the display away from strong sources of magnetic fields.
- Make sure the display and computer are both switched off before connecting the signals.

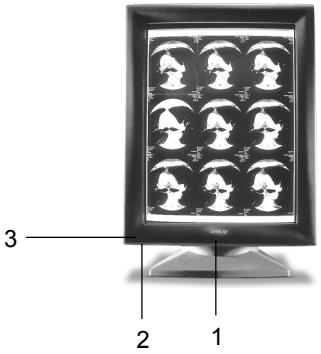
The package contents

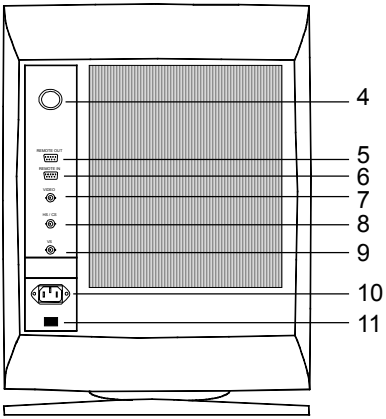
- The MGD 221 display
- The accessory box (in which you found this manual)

Notes:

- The MGD 221 can be part of a complete MeDis® system, consisting of the display itself, an imaging board and software. In that case, the package contains a lot more items. The contents of the package is then described in the manual of the complete system.
- The ambient light shield inside the accessory box should always be used during conformity calibration with the X-Rite DTP92 optical sensor.

Controls and connectors





{1} Optical sensor plug

{2} Ambient Light Compensation (ALC) sensor (optional)

{3} Green power LED

{4} Control knob, combination of a push button and a turning knob. The control knob is used for switching the power on/off, and selecting and performing functions in the OSD (on-screen display) menu.

{5} Remote (RS-232) output

{6} Remote (RS-232) input

{7} Video input

{8} Horizontal / composite sync. input

{9} Vertical sync. input

{10} Power input

{11} Power button

Signal connection

a) Connection of video signals

The connected equipment must comply to all relevant safety demands. Important: The use of low-quality video cables can distort the video signal and influence diagnosis.

1. Check the **impedance** of the imaging board that produces the video signals you want to connect. It must be 75 Ohm (just like the input of the display). If not, the quality of the images on the display will be inferior.
2. Connect the video output of the computer's imaging board to the **video and sync inputs** on the display's rear panel. Use a proper video cable. The video cable is not supplied with the display, unless the display comes as part of a complete BARCO MeDis system, that also contains an imaging board.
   The inputs accept the following signals:

• Video with separate horizontal and vertical sync.

- The video cable has 3 wires.
- Connect the video signal to the connector Video **{7}**.
- Connect the horizontal sync signal to the connector HS/CS **{8}**.
- Connect the vertical sync signal to the connector VS **{9}**.

• Video with external composite sync.

- The video cable has 2 wires.
- Connect the video signal to the connector Video **{7}**.
- Connect the composite sync signal to the connector HS/CS **{8}**.

• Video with internal composite sync (sync on video).

- The video cable has 1 wire.
- Connect the video (with sync) signal to the connector Video **{7}**.

Notes:

- The video inputs cannot be connected in loop-through (daisy-chain).
- The required video amplitude: 700 mV ± 3 dB.
- The required sync. amplitude: 500 mV.

b) Connection of data signals

The display can be controlled remotely by a computer through the serial data bus. A typical example of this, is the **MediCal** software that controls the display. MediCal runs on a PC that is connected through the serial data bus. This PC is not necessarily the same computer as the one that produces the video signals.

Unlike the video signals, it is possible to daisy-chain the serial data bus. This means you can control different displays from one PC.

To connect the data signals:

1. Connect one end of the serial data cable to one of the PC's **COM ports**. If the COM port has a 25-pin connector, you will need to use a **D25-to-D9 interface connector**. The cable and the interface connector are both supplied with **MediCal**.
2. Connect the other end of the serial data cable to the **Remote In** connector **{6}** on the display's rear panel.
3. For a daisy-chain application, connect the **Remote Out** connector **{5}** of the first display to the **Remote In** connector **{6}** of the next display.

c) Connection of optical sensor

To calibrate the display, connect the optical sensor to the **Sensor** connector **{1}** at the front.

Notes:

- The display supports the DTP 92 from X-Rite as optical sensor.
- The optical sensor is not supplied by BARCO.
- Calibration can be done by means of MediCal only.
- **Always use the Ambient Light Shield during calibration**.

1

At the front, the sensor plug is located under the bezel.

d) Connection of power

1. Power cord: Utilize a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
2. Plug one end of the power cord into the rear of the display (connector LINE **{10}**). Plug the other end into a **grounded** AC power outlet. The display automatically adapts to the voltage. The voltage range is: 100-240 VAC +/- 10%.

Positioning the display

The tilt and swivel base allows you to adjust the height and viewing angle of the display to obtain an optimal viewing comfort.

Important considerations

- The best environment for diagnostic imaging is one with controlled and dimmed ambient light. The human eye's sensitivity depends on the ambient light strength. It is most sensitive to small contrast changes (or subtle image details) at limited ambient light levels.
- The best ambient light level, expressed in Lux, depends on the application. An office illumination typically requires 500 Lux. A dimmed environment, like a softcopy room, requires less than 100 Lux.
- Using your display in a controlled and dimmed environment also extends its lifetime, because the display can operate at limited brightness and contrast. These levels correspond to the calibrated position in most cases.
- A controlled ambient light environment implies the ambient light is as constant as possible. Cover windows to keep out the daylight. Avoid switching the lights and viewing boxes on and off. A consistent environment results in more image consistency and less eye fatigue.
- Avoid reflections in the picture tube. Provide indirect lighting. Don't place the displays in front of or close to a light source like a window or viewing box, although this may be very tempting. As a rule of thumb, keep viewing boxes at least one metre (3 feet) away from the displays.

OPERATION: USER CONTROLS

Important:

The best way to adjust and control the display is by using MediCal, which displays the ideal test patterns for correct adjustment. However, in case you do not dispose of MediCal, you can control and adjust the display by means of the built-in On-Screen Display (OSD).

Switching on / off

Power on/off

Press the Power button **{11}** on the rear panel to switch on the display. **The green LED at the front is off when the display is operating.**

If the display starts up with no image and the green LED **{3}** on, it is in stand-by. This is the case when the display was powered down while in stand-by.

Manual stand-by

To put the display in manual stand-by mode, press the control knob **{4}** shortly. As a result, the green LED is ON continuously.

Note: You cannot switch the display in manual stand-by when the on-screen display (OSD) is visible. In that case, first exit the OSD, and then press the control knob to switch to stand-by mode.

To activate the display from stand-by mode, press the control knob **{4}** again. As a result, the LED is switched off again.

Automatic power saving system (DPMS)

The power saving system, if switched on, can power down the display when you don't use the computer that produces the video and sync. signals for a while. In that way, the system reduces the display's power consumption.

While the display is powered down, the picture tube will be blanked, and **the green LED on the front is blinking**. In the last DPMS mode, the LED will be on continuously.

The power saving system is switched off when the display is produced. It can be switched on by a qualified technician.

Note: The power saving system can only work if the connected imaging board supports power management.

For more details, please read Appendix A, "Background information".

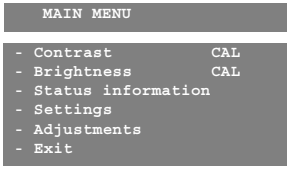
Contrast and brightness control

Contrast and brightness can be controlled through the OSD menus.

To activate the OSD

Turn the control knob **{4}** from left to right or from right to left. As a result, the OSD main menu appears.

Note: The control knob should turn over at least 30 degrees before the OSD becomes visible.



The OSD main menu

The main menu indicates the current setting for contrast and brightness.

This can be:

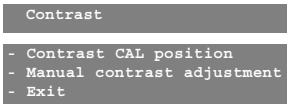
- CAL: The calibrated position. This is the preferred setting in a controlled environment.
- ALC: For contrast only. This indicates the Ambient Light Compensation (ALC) is on, and contrast is controlled automatically, depending on the ambient light. ALC is an option.
- <empty> When the main menu does not specify a setting, contrast or brightness is manually set to a different value than the calibrated position.

To put contrast in calibrated position

1 Turn the control knob to select **Contrast** in the OSD main menu.

2 Press the control knob shortly. The contrast control menu appears.

3 In the contrast control menu, select **Contrast CAL position** and press the control knob shortly.



Contrast control menu

To control contrast manually

1 Turn the control knob to select **Contrast** in the OSD main menu.

2 Press the control knob shortly. The contrast control menu appears.

3 In the contrast control menu, select **Manual contrast adjustment** and press the control knob shortly. The contrast scroll bar appears.

4 Turn the control knob until you have reached the desired contrast.

5 Press the control knob shortly or wait a few seconds to return to the contrast control menu.

6 In the contrast control menu, select **Exit** and press the control knob shortly to return to the main menu. Alternatively, you can just wait a few seconds, and the OSD returns to the previous menu automatically.

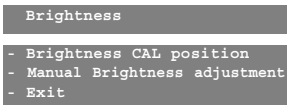
To put brightness in calibrated position

Contrast scroll bar. The short stroke in the bar indicates the calibrated position, the long stroke indicates the current setting.

1 Turn the control knob to select **Brightness** in the OSD main menu.

2 Press the control knob shortly. The brightness control menu appears.

3 In the brightness control menu, select **Brightness CAL position** and press the control knob shortly.



Brightness control menu

To control brightness manually

1 Turn the control knob to select **Brightness** in the OSD main menu.

2 Press the control knob shortly. The brightness control menu appears.

3 In the brightness control menu, select **Manual brightness adjustment** and press the control knob shortly. The brightness scroll bar appears.

Brightness scroll bar. The short stroke in the bar indicates the calibrated position, the long stroke indicates the current setting.

4 Turn the control knob until you have reached the desired brightness.

5 Press the control knob shortly or wait a few seconds to return to the brightness control menu.

6 In the brightness control menu, select **Exit** and press the control knob shortly to return to the main menu. Alternatively, you can just wait a few seconds, and the OSD returns to the previous menu automatically.

Viewing Status information

You can view the status and actual settings of the display. You cannot change them in the Status Menu. Changing the settings is reserved for trained service staff only.

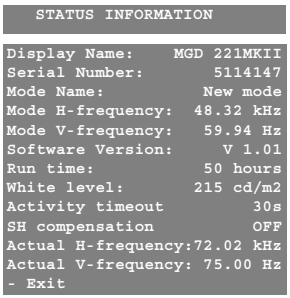
To view the status information

Turn the control knob to select **Status information** in the OSD main menu.

The Status information menu appears. The only control in the menu is **Exit**.

Explanation of the Status information menu items

Display Name:



Status information menu

This is the display type.

Serial Number:

This is the display's serial number.

Mode Name:

The currently selected scanning mode.

Mode H-frequency, Mode V-frequency:

These are the horizontal and vertical sync frequencies of the currently selected scanning mode. These are the figures stored in the memory.

Software Version:

The internal software version.

Run time:

The total operating time since production, including burn-in time.

White level:

The display's white level or light output after calibration, in calibrated position.

Activity timeout :

This is the time, expressed in seconds, before the display interrupts the data communication with the computer (e.g. during a computer session with MediCal) if the computer does not respond anymore.

SH compensation (optoinal):

Indicates if Southern Hemisphere compensation is switched on or off. Note: Southern Hemisphere compensation is an option. If the option is not installed in the display, this line does not appear in the menu.

Actual H-frequency, Actual V-frequency:

These are the actual horizontal and vertical sync frequencies of the connected video signal. They are measured constantly by the display.

Other adjustments

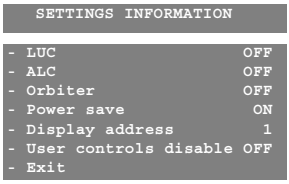
The main menu items **Settings** and **Adjustments** are reserved for trained service staff and are therefore password - protected.

ADVANCED SETTINGS AND ADJUSTMENTS (FOR SERVICE STAFF ONLY)

Important:

The functions and controls described in this chapter can have a serious impact on the performance of the display. They should be touched by trained service staff only!

Settings



The Settings menu

To change the settings

1 Turn the control knob at the rear from left to right or from right to left to activate the On-Screen Display (OSD) main menu.

2 In the main menu, turn the control knob to select **Settings**.

3 Press and hold the control knob **for a few seconds**.
The Settings menu appears. It displays each setting and its current status.
Note: If you press only shortly, the message "Service protected" appears.

4 Turn the control knob to select the setting you want to change.

5 Press the control knob shortly to change the selected setting.

6 For **Display address**, you can change the setting by turning the control knob.
Return to the Settings menu by pressing the control knob.
For the other settings, the new status instantly appears in the Settings menu.

Explanation of the Settings menu items

LUC:

LUC is short for Luminance Uniformity Control. When switched on, the internal waveform processor will modulate the gain of the video amplifier so that the luminance is equal all over the screen (within a tolerance of +/- 5%).

The LUC system can be calibrated in the Adjustments menu (see further).

ALC (optional):

ALC is short for Ambient Light Compensation. When this setting is on, the contrast is controlled automatically, depending on the ambient light, measured by the ALC sensor **{2}** in the bezel.

Orbiter:

The Orbiter is an internal circuit that, when switched on, will slightly and slowly move the image to prevent pixel burn-in.

Power save:

This setting can switch the automatic power saving system (see Introduction chapter) on or off.

Display address:

In multi-head systems (multiple displays controlled by one system), each display must have a different address. With this setting you can set the display address from 1 to 16.

User controls disable:

With this setting you can enable or disable the user controls.

When **OFF**, the user controls are not disabled, and the user can activate and use the OSD menus.

When **ON**, the user controls are disabled. After quitting the OSD, the user will no longer be able to activate the OSD.

To activate the OSD again when the user controls are disabled, use the following "code":

1 Turn the control knob 3 times counter-clockwise (seen from the rear).

2 Turn the control knob 3 times clockwise.

3 Turn the control knob 3 times counter-clockwise.

Note: This should be done in quite a short time!

Saving the settings

The settings are automatically saved after changing them.

Adjustments

a) How to make the adjustments

1 Turn the control knob at the rear from left to right or from right to left to activate the On-Screen Display (OSD) main menu.

2 In the main menu, turn the control knob to select **Adjustments**.

3 Press the control knob **for a few seconds**.
The Adjustments menu appears.
Note: If you press only shortly, the message "Service protected" appears.

4 Turn the control knob to select the category of adjustments you want to make.

5 Press the control knob shortly to enter the selected category.

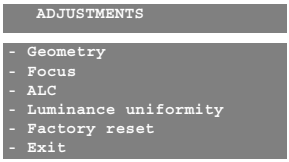
6 In the selected menu, select the adjustment you want to make and press the control knob shortly to display the adjustment scroll bar.

7 Turn the control knob to perform the adjustment. After adjusting, press the knob shortly to confirm the adjustment and return to the menu, or press for a longer time to undo the adjustment and return to the menu.

8 Return to the previous menu by pressing the control knob *shortly* or selecting **Exit** when present.

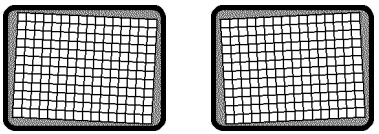
b) Description of the adjustments

Geometry

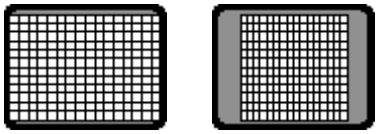


Adjustments menu

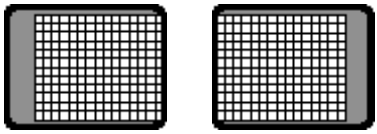
Rotation



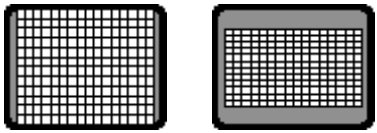
Width



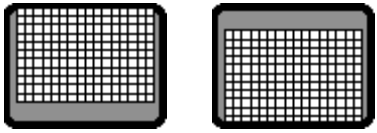
Horizontal position



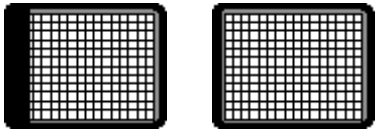
Height



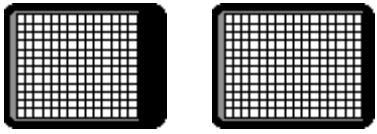
Vertical position



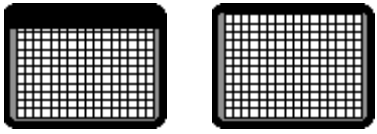
Blanking - Blanking left



Blanking - Blanking right



Blanking - Blanking top



Interlacing - Pre correction

In most cases you do not need to change this adjustment.

You may need to increase this adjustment only when the connected video and sync signal contains an abnormally big number of equalization pulses before the vertical sync (more than 8 lines), resulting in a phase error (geometry distortion) at the bottom of the image.

Interlacing - Post correction

In most cases you do not need to change this adjustment.

You may need to increase this adjustment only when the connected video and sync signal contains an abnormally big number of equalization pulses after the vertical sync (more than 8 lines), resulting in a phase error (geometry distortion) at the top of the image.

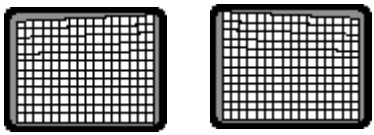
SH Compensation (optional)

If your display is equipped with the Southern Hemisphere option, the on-screen display menu contains additional functions to adjust the image geometry. If the option is not installed in the display, this menu does not appear.

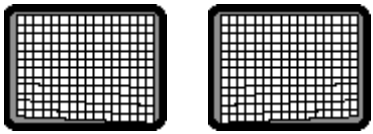
SH Compensation - SH Compensation ON/OFF

For proper geometry adjustment in the Southern Hemisphere, you must switch SH Compensation ON. If not, the SH controls will not function.

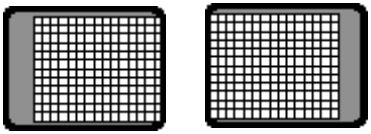
SH Compensation: SH Top



SH Compensation: SH Bottom

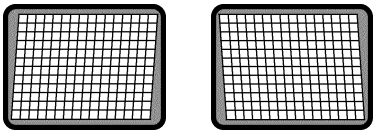


SH Compensation: SH Position

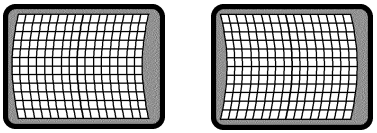


With SH Compensation on, we advise to use the SH Position control instead of the Horizontal Position control in the Geometry menu.

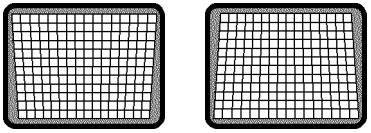
Advanced geometry - Horizontal skewing



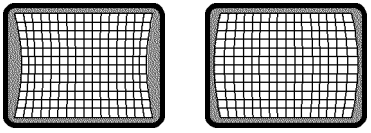
Advanced geometry - Horizontal bowing



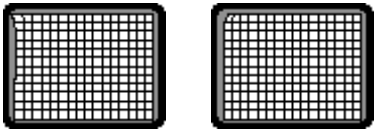
Advanced geometry - Horizontal trapezium



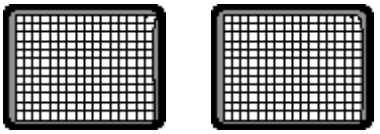
Advanced geometry - Horizontal parabola



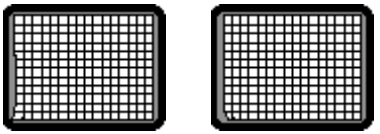
Advanced geometry - Corner top left



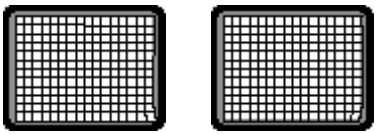
Advanced geometry - Corner top right



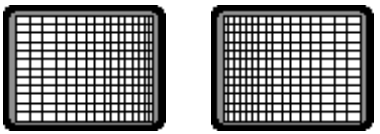
Advanced geometry - Corner bottom left



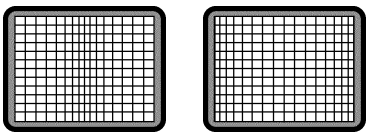
Advanced geometry - Corner bottom right



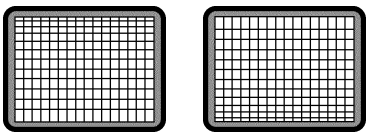
Advanced geometry - Linearity & S-correction - Horizontal linearity



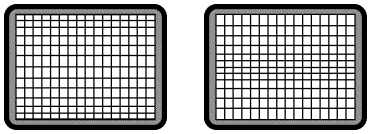
Advanced geometry - Linearity & S-correction - Horizontal S-corr



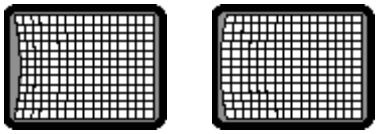
Advanced geometry - Linearity & S-correction - Vertical linearity



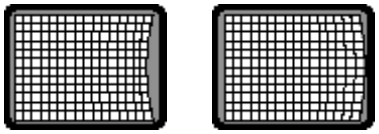
Advanced geometry - Linearity & S-correction - Vertical S-corr



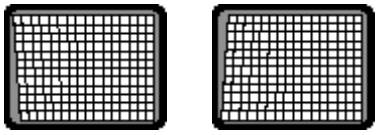
Advanced geometry - Advanced bowing & skewing - Horizontal bowing left



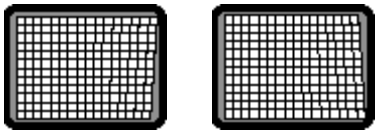
Advanced geometry - Advanced bowing & skewing - Horizontal bowing right



Advanced geometry - Advanced bowing & skewing - Horizontal skewing left



Advanced geometry - Advanced bowing & skewing - Horizontal skewing right



Focus

Static focus

Adjust Static focus to obtain an image as sharp as possible in the center.

Focus zone

You can adjust the focus in 9 independent zones. Turn the control knob to obtain an image as sharp as possible in the selected zone. Press the control knob to switch to the next zone.

ALC (optional)

Ambient Light Compensation (ALC) is an optional system that automatically adapts the display contrast and brightness level to the ambient light in the room. The system has to be adjusted by setting the contrast and brightness in the darkest ambient light conditions the user works, and then repeating this in the brightest conditions.

To adjust the ALC system, proceed as follows:

1. Dim the light in the room to create the darkest ambient light condition the user normally works in.
2. Enter the **Minimum illuminance** menu.
3. Select **Measure ambient light**. The display now stores the ambient light level that corresponds to the darkest condition.
4. Select **Contrast** and set the display contrast to the desired level.
5. Select **Brightness** and set the display brightness to the desired level.
6. **Exit** the Minimum illuminance menu.
7. Increase the light in the room to create the brightest ambient light condition the user normally works in.
8. Enter the **Maximum illuminance** menu.
9. Select **Measure ambient light**. The display now stores the ambient light level that corresponds to the brightest condition.
10. Select **Contrast** and set the display contrast to the desired level.
11. Select **Brightness** and set the display brightness to the desired level.
12. **Exit** the Maximum illuminance menu.

Luminance uniformity

This menu allows you to calibrate the display, including the Luminance Uniformity circuit.

Proceed as follows:

1 Connect the X-Rite DTP92 sensor and apply the black shield (see chapter "Installation").

2 Follow the instructions on the screen.

Factory reset

This function allows you to undo all adjustments you have made since the display left the factory.

Select **Go ahead** to restore the factory settings.

Select **Exit** to return to the previous menu without erasing the adjustments.

c) How to save changes

Proceed as follows:

1 After having made the adjustments, select **Exit** in each appearing menu until the **Save Changes?** message appears.

2 Select **Yes** to save the changes.
Select **No** to exit the OSD menus without saving the changes.

What happens upon saving?

- When the current scanning mode was already stored in the display memory, the scanning mode is updated with the new adjustment values.
- When the scanning mode was not yet stored in the memory, the display will create a new scanning mode in the memory.
  However, when the memory was full, the monitor will display a list of scanning modes in the memory and ask if you wish to overwrite one of them. If you want to store the adjustments you have made, you will have to overwrite one of the scanning modes in memory.

MAINTENANCE

Picture tube

The glass panel of the picture tube is handled with a special coating. Take care not to damage or scratch the coating.

Clean the picture tube with a soft woolen or cotton cloth.

The cloth should be moist, not wet!

Use a watery solution or a mild commercial glass cleaning solution.

Apply (e.g., spray) the solution on the cloth, not on the picture tube.

Cabinet

Clean the cabinet using a recognized cleaning product for medical equipment. The cloth you use must be moist, not wet!

The cabinet has been tested for resistance to the following products: Cidex, Betadine, Alcohol (Isopropyl and Ethyl), Ammonia-based cleaners (Windex) and Aquasonic Gel.

TROUBLESHOOTING

There appears no image on the picture tube, the green LED at the rear is out

- Check if the power cord is properly connected to the power outlet and to the display.
- Check if the power button is switched on.

There appears no image, the green LED is on

The display is switched in Stand-by, manually or by the automatic Power saving system.

- Press the control knob at the rear shortly.
- Try to switch on the display by pressing any key on the keyboard of the computer that produces the video and sync. signals for the display.
- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.

There appears no image, the green LED is blinking

The display is switched in a power saving mode by the automatic Power saving system.

- Press the control knob at the rear shortly.
- Try to switch on the display by pressing any key on the keyboard of the computer that produces the video and sync. signals for the display.
- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.

On the picture tube appears the message "No Valid Sync Signal"

- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.
- Check if the sync. signals are connected in the proper way (refer to the chapter "Installation").
- Check if both horizontal and vertical sync. frequencies match the display specifications (refer to the chapter "Technical specifications").

For other problems, please consult your technical service department.

APPENDIX A: BACKGROUND INFORMATION

Luminance Uniformity Correction

A characteristic (or limitation) of every picture tube (CRT) is that the luminance decreases towards the edge of the screen surface. The decrease is normally 20 to 30 %.

This is caused by the shape of the picture tube. Inside the CRT, a so-called *electron gun* shoots an electron beam towards the front (the glass panel). Because this panel is rather flat instead of having a spheric shape, the electron beam has to 'travel' a longer distance in the corners than in the center. So the intensity is higher in the center.

This phenomenon is even increased by the irregular distribution of the phosphor and aluminium layer on the glass panel. These tend to be thicker in the center.

BARCO has developed a special system, called Luminance Uniformity Correction (LUC), that solves this problem. The LUC system enhances the light output at the edges of the CRT, so that the luminance there is the same as in the center.

The LUC system is calibrated in the factory. From time to time, it has to be re-calibrated at the customer's site by means of the light sensor you use for normal color calibration. The system can be calibrated and switched on or off by a qualified technician.

Power saving system

The display is equipped with circuits that can handle power saving management. When the system is switched on, it can power down the display in several steps.

The system is controlled by the imaging board or the PC that delivers the video signals. When you are working on the computer, the imaging board delivers both sync signals, and the display is operating normally. When you don't touch the computer keyboard for a certain time, the imaging board only delivers vertical sync. This is sensed by the display's micro controller, that blanks the image on the CRT. This results in a drop of power consumption with about 25 %.

When you leave the computer idle for a longer period, the imaging board now delivers horizontal sync only. As a result, the display's micro controller switches off a number of internal circuits. The power consumption has now dropped with about 42 %.

At last, the imaging board delivers no sync signals at all, and the micro-controller switches off all but one power supplies in the display. Only the micro-controller's own supply keeps on running, resulting in a very low power consumption of 6 W.

If you start using the computer again, the imaging board switches on both sync signals, and the micro-controller switches on the display.

The times after which the different steps of power management must become active, is set in the PC's display properties.

APPENDIX B: TECHNICAL SPECIFICATIONS

Picture tube:
Faceplate transmission:
No Panel: +/- 34%
AR panel: 30%

Faceplate type: AR panel or No Panel
Image representation: portrait
Phosphor: B4-L8

Light output:
Calibrated: 215 Cd/m²

Resolution:
Max. adress. pixels: 1280
Max. adress. lines: 1600

Scanning systems
Horizontal scanning:
Multi sync: □-controller controlled
VGA boot range: 30-35 kHz

Normal operation range: 80-140 kHz

Minimum blanking : 2.4 □s
Storable scan frequencies: 4
Prealigned scans: 1
Vertical scanning:
Minimum frequency: 48 Hz
Maximum frequency: 150 Hz
Minimum blanking: 250 □s (after leading edge)

Geometry
Nominal size (4/3 ratio): 300mm x 400mm
Nominal size (4/5 ratio): 304mm x 380mm

Inputs
Video
BNC connectors 75 Ohm
Nominal level: 0.7 Vpp
Sync
BNC connectors 75 Ohm
Nominal level: 0.5 Vpp
Communication inputs/outputs
RS232 9-pin sub D connector
Baudrate: 9600

Power supply:
Voltage: 100 - 240 V +/- 10%
Frequency: 50/60 Hz
Current: 2.3 A

Environmental
Temperature range (°C):

Storage:	-20/+65
Operation:	0/+45
Within specs:	15/+30

Altitude: storage: 25 000 ft
operational: 10 000 ft
Humidity (relative): 95 % max., non condensing

Weight: (No Panel version)

Unpacked	Packed
37.4 kg	55.9 kg

Dimensions packing:
H x W x D: 788mm x 630mm x 780mm

Dimensions monitor (mm):

Height:	558
Width:	400
Depth:	561

Modifications reserved.