

# Instructions for Use

## PDC0100

Analog DVI converter

### **Important**

Please read the safety information and all information delivered with the product carefully to familiarize yourself with safe and effective usage.



## Legal information

### Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 <b>DANGER</b>
indicates that death or severe personal injury <b>will</b> result if proper precautions are not taken.
 <b>WARNING</b>
indicates that death or severe personal injury <b>may</b> result if proper precautions are not taken.
 <b>CAUTION</b>
indicates that minor personal injury can result if proper precautions are not taken.
<b>NOTICE</b>
indicates that material damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

### Qualified personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

### Use of EIZO products

 <b>WARNING</b>
EIZO products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by EIZO. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

### Trademarks

All names identified by ® are registered trademarks of their respective owners. Please refer to the trademarks listed in the appendix. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

### Disclaimer of liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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# 1 Introduction

## 1.1 Contents of this document

<b>Note</b>
This documentation is available in electronic format only. It can be found on the CD-ROM provided and can be downloaded from <a href="http://www.eizo-or.com">www.eizo-or.com</a> .

This document explains the functionality and the approved use of the Analog DVI Konverter PDC0100. To ensure clarity, it does not contain all detailed information on this product.

The contents of this document are neither part of a previous or existing agreement, commitment or legal relationship, nor does it modify such.

## 1.2 Intended use

The Analog DVI Konverter PDC0100 is used to convert analog signals into a digital video signal.

The device is designed for individual connection to a graphics card with a mains voltage of 240 V or 110 Volt.

## 1.3 User

### User

In the following, healthcare personnel such as surgeons or medical technicians are referred to as the "user".

### Service / service personnel

"Service" or "Service personnel" identifies authorized personnel with knowledge of medical imaging technology, local standards for image quality requirements, and safety of medical products, for example a hospital technician or manufacturer of medical devices.

### Cleaning staff

"Cleaning staff" refers to personnel responsible for cleaning medical devices.

## 2 Safety information

### 2.1 General safety instructions

Correct and safe operation of EIZO devices assume professional transport, storage, installation, and connection, as well as careful operation and service.

The devices may only be used for applications for which they are intended.

For safety reasons, the following precautions must be observed:

 <b>DANGER</b>
<p><b>Please observe all warning information present on the device and in the instructions for use.</b></p> <p>There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur.</p> <p><b>Observe the safety requirements of EN 60601-1 (IEC 60601-1)</b></p> <p>To prevent injury to patients and users, connect the electrical system in accordance with the safety requirements of EN 60601-1 (IEC 60601-1) for "Safety requirements for medical electrical systems".</p> <p><b>Connecting the protective earth conductor</b></p> <p>If the device is connected to line power, the device must be connected to a protective ground conductor. This is the only way to ensure that the touch leakage current in a first fault event does not exceed 500 <math>\mu</math>A.</p> <p>The interruption of the device's protective conductor is considered a first fault event in accordance with EN 60601-1.</p> <p>Use the following measures to ensure that the leakage currents remain below the specified limits:</p> <ul style="list-style-type: none"><li>• Separators for signal input unit or signal output unit</li><li>• Use of a safety isolating transformer</li><li>• Use of the additional protective ground terminal</li></ul> <p>Mounting of the monitor: The monitor's suspension arm must have its own protective ground conductor. This protective ground conductor guarantees, together with the protective ground conductor of the monitor, that the housing leakage current always remains less than 500 <math>\mu</math>A, even in the event of a single fault condition.</p> <p><b>No unauthorized opening of the device / no unauthorized service or maintenance work</b></p> <p>The device may only be opened by qualified personnel. Likewise, service or maintenance work may only be carried out by qualified personnel. There is a risk of electric shock.</p> <p>No liability is accepted for death and injury to persons or damage to property resulting from work carried out by non-qualified personnel.</p> <p><b>Do not touch components in the device</b></p> <p>If the device is connected to the line power, components in the device are subjected to high voltages. Touching the components may be fatal.</p> <p><b>No contact between device and patients</b></p> <p>The device is not suitable for direct contact with a patient. The device and patient must never be touched simultaneously. Otherwise there is a danger to life and limb.</p>

 **DANGER**

**Please observe all warning information present on the device and in the instructions for use.**

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur.

**Never use defective power cables**

If a damaged or unsuitable power cable is used, it could result in a fire or electric shock. Only use power cables with PE contacts approved by the manufacturer.

**Disconnect the power cable correctly**

When disconnecting the power cable, always do so by holding the plug. Ensure that your hands are dry. There is a risk of electric shock.

**Do not insert any objects into the housing**

Objects inserted into the housing may result in an electric shock or damage to the device.

**Do not place any objects on top of the device**

If you place objects on top of the device, this can lead to overheating and fire.

**Avoid penetration of liquid**

Liquids seeping into the device may result in electric shock or device failure.

 **CAUTION**

**Extensive damage to property may result if the device is not connected correctly**

That is why you should observe the warning information:

**Connection must be carried out by specialists**

Please ensure that all steps are taken to avoid injuries or incorrect diagnoses.

- Only use the video cables specified by the manufacturer for the connection.
- Only use power cables with PE contacts.
- Only use power outlets with PE contacts.
- Do not connect too many devices to a power outlet or extension cable.
- Observe the information provided by the respective manufacturer.
- If required by the application or local regulations, QA software must be used for quality control and documentation.

**Connection in the USA and Canada**

Molded power supply plugs must comply with the requirements for "hospital grade attachments" CSA Std. C22.2 No. 21 and UL 498.

**Connection in China**

Only use power cables approved for China. These power cables are identified by the labels "CCC" or "CQC".

**Observe the country-specific regulations**

Observe all regulations of the country in which the device is used.

**NOTICE**

**Extensive damage to property may result if the device is not connected correctly**

That is why you should observe the warning information:

- Desktop installation:  
Place the device on a solid and level surface. The attached stand, as well as the installation surface, must be suitable for the weight of the device.
- For mounting on a wall or ceiling suspension:  
The mount unit must be suitable for the weight of the device.
- For installation in a rack:  
Observe the installation sequence, and provide ventilation for the device.

**Provide adequate air circulation**

When installing the device, ensure that there is adequate air circulation for operation. The permissible ambient temperature range must not be violated. Otherwise, the device could be destroyed by overheating.

**Avoid sources of heat**

Do not install the device in the vicinity of sources of heat, such as radiators, heating appliances or other devices that can generate or emit heat.

**Do not subject the device to jolting or shocks**

The device contains sensitive electronic components that could be damaged by jolting or shocks.

**Only switch on a cold device following adaptation to room temperature**

If the device is brought into a room with a higher or rising temperature, condensed water will form in and on the device. Do not switch on the device until the condensed water has evaporated. Otherwise, the device could be damaged.

**NOTICE**

**Extensive damage to property may result if the device is not connected correctly**

That is why you should observe the warning information:

**Transportation only in original packaging**

Use the original packaging for transportation, and transport in the correct shipping position. Be sure in particular to protect the monitor LCD modules from shocks.

**Care of device / cleaning agents**

- Remove water drops immediately; extended contact with water discolors the surface.
- Only clean the surfaces using the cleaning agents referred to in the Instructions for Use.
- Monitor: The screen is extremely sensitive to mechanical damage. Absolutely avoid scratches, shocks, etc.

**What to do if the device is faulty**

If the following conditions exist, the device must be disconnected from the line power supply and checked by qualified personnel:

- Damage to the plug or power cable.
- After liquid seeps into the device.
- If the device has been exposed to moisture.
- If the device does not function or if a fault cannot be eliminated using the Instructions for Use.
- If the device has been dropped and/or the housing damaged.
- If the device smells of burning or makes peculiar noises.

**Be aware of the monitors aging**

Note that monitors can fail as a result of aging, and that image properties such as brightness, contrast, and color value can change.

**Do not touch the monitor screen**

Due to mechanical pressure or electrostatic discharges, touching the screen can result in brief disturbances to the image.

## 3 Description

### 3.1 Scope of delivery

The scope of delivery includes the device and various components. After unpacking, check the scope of delivery for correctness and completeness.

Note
Keep the packaging material for subsequent transport of the device.

#### Device

Produkt	Bestellnummer	Beschreibung
Analog DVI Konverter PDC0100	6GF60100BA02	Konverter with all components.
Analog DVI Converter PDC0100-SP	6GF60100BA03	Konverter without components (only with Safety notes and documentation CD) .

#### Components

The following components are included in the scope of delivery: :

- 1 Remote Key Pad for PDC0100
- 1 Power supply
- 1 Power cable EU
- 1 Ppower cable US
- 1 DVI cable 2m
- 1 VGA cable 3m
- 1 BNC to VGA adapter
- 1 CAT Patch cable 30 m
- 1 Safety notes
- 1 CD with documentation

## **3.2 Features**

### **RGB input (15-pin Sub-D/DVI/BNC)**

The analog DVI converter is connected to the computer system via the 15-pin sub-D input socket.

If necessary, the monitor display is adapted using an OSD menu.

### **Video inputs**

The analog DVI converter features two additional analog video inputs. The monitors can therefore be operated with analog standard video signals (PAL/NTSC). The RGB and video inputs can be simultaneously connected to different signal sources.

### **Force Mode**

The Force Mode function is used to adapt the PDC0100 analog DVI converter to special timing settings.

### **Specially for use on a Large Monitor Manager**

The analog DVI converter is specially designed for use on a Large Monitor Manager from EIZO. It is used to increase the number of analog inputs.

## 4 Setup and installation

### CAUTION

#### Changes to device

Do not make any mechanical or electric changes to the device. Otherwise the device warranty becomes invalid.

The manufacturer is not liable for changes made to the device.

### 4.1 Site

#### Provide adequate ventilation

Ventilation slots are located on the top of the housing. Do not cover the vent slots. A distance of 2 cm must be observed between the vent slots and other devices or covers.

#### Observe the permissible ambient temperature range

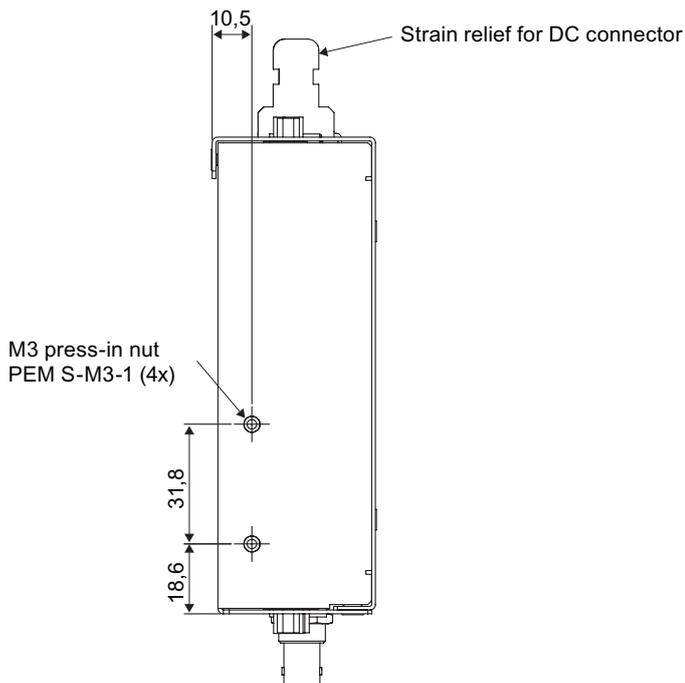
The unit must not be operated outside the permissible ambient temperature range.

#### Change of environment

If the unit is brought into a warm environment from a cold one, condensation may form in the unit. The unit should not be switched on until all the condensed water has evaporated, including that inside the unit. This may take several hours, depending on the conditions.

### 4.2 Mounting the monitor

M3 press-in nuts are provided on both sides of the PDC0100 for installation.



## 5 Connecting

### 5.1 Safety information for connection

Observe all safety information and warnings for the device to ensure danger-free operation.

 <b>CAUTION</b>
<b>Changes to device</b> Do not make any mechanical or electric changes to the device. Otherwise the device warranty becomes invalid. The manufacturer is not liable for changes made to the device.

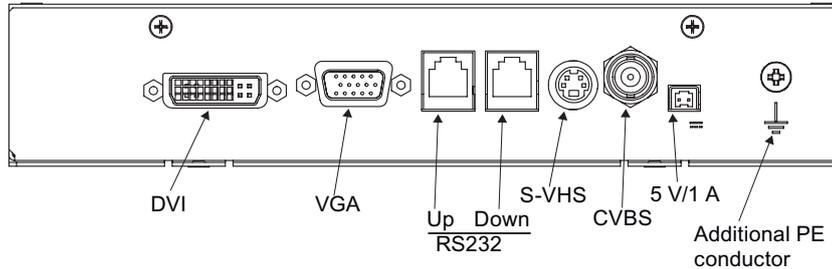
 <b>CAUTION</b>
<b>Shielding measures</b> Follow all shielding measures in accordance with local EMC directives. If these guidelines are not observed, device malfunction may result.

<b>NOTICE</b>
<b>Mains voltage</b> <ul style="list-style-type: none"><li>• The device is designed for individual connection to a graphics card with a mains voltage of 240 V or 110 V (TN-S system with protective earth).</li><li>• All input signals and voltages must be subject to protection class SELV (Safety Extra Low Voltage).</li></ul>

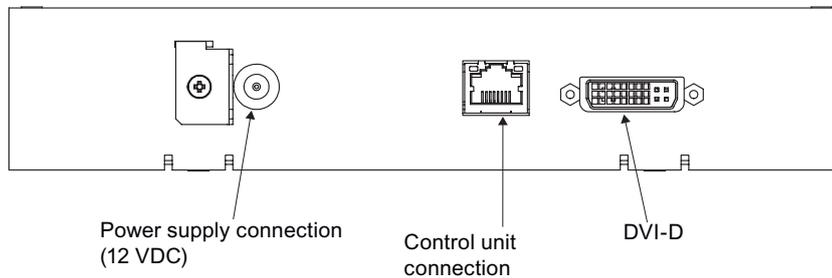
<b>NOTICE</b>
<b>Cable installation</b> Observe the following instructions: <ul style="list-style-type: none"><li>• Only shielded cables are to be used for all signal connections.</li><li>• If the relevant facility is available on the connector, all plug connections must be screwed tight or locked.</li><li>• The connecting cables must not be kinked.</li><li>• The minimum bending radius of a connecting cable generally equals five times the cable diameter.</li><li>• Do not route signal cables and power cables next to one another. Otherwise, line power subject to heavy interference could result in reversible pixel errors.</li><li>• The device must not share a line power supply with motors or valves (interference!).</li><li>• Externally connected cables can represent a trip hazard. Make sure that all incoming cables are safely routed.</li><li>• If the device offers strain relief mechanisms for the cables, use them to prevent unintended loosening of connected cables.</li></ul>

## 5.2 Connector locations

### Inputs of the Analog DVI Konverter PDC0100



### Output of the PDC0100 and power supply



## 5.3 Connecting the signal cables

### Note

- The video signals coming from a graphics card are referred to below as RGB signals, and those coming from a camera, DVD player, video recorder etc. as video signals. In the OSD menu, some of the menu monitors are also appropriately identified by RGB or video in the header.
- At least one signal source must be connected in order to activate the OSD.
- All signal inputs may be connected simultaneously.
- The Up and Down keys can be used to select which RGB or video source is to be displayed when the OSD is not active. Selection is also possible in the OSD.

### 15-pin Sub-D female connector

- Connect VGA cable with 15-contact Sub-D connector (male) for the analog input to the 15-contact Sub-D connector (female).

### DVI socket (input)

- With DVI analog signal

### DVI socket (output)

- With DVI digital signal

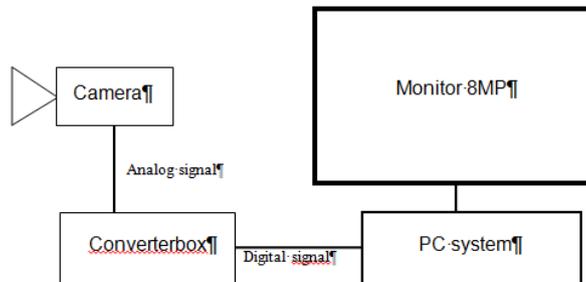
The analog pins of the DVI plug are not connected internally.

#### 4-pin mini-DIN socket (video input)

- Connect video cable for the sync video input (Y/C signal) to the 4-pole mini-DIN socket.

#### BNC socket (video input)

- Connect video cable for the composite input to the BNC socket.



## 5.4 Connecting the power supply

### ⚠ CAUTION

Only the power supply units offered as accessories may be used.

### ⚠ CAUTION

#### Connecting to line power

The power supply unit (accessory) is designed for line power with a grounded neutral conductor.

- To avoid risk of electric shock, this device must only be connected to line power with a protective conductor.
- Contact the responsible building technician or a qualified electrician if you are uncertain whether the line power is equipped with a protective conductor.

### ⚠ CAUTION

#### Connection in China

Only use power cables approved for China. These power cables are identified by the labels "CCC" or "CQC".

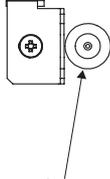
### ⚠ CAUTION

#### Connection in the USA and Canada

Molded power plugs must comply with the requirements for "hospital grade attachments" CSA Std. C22.2 No. 21 and UL 498.

The connection for the power supply is located on the front of the analog DVI converter. This is a 12 VDC connection.

The device does not have an on/off switch.



Power supply connection (12 VDC)

- Secure the power supply cable to the metal lug using a cable tie.

## 5.5 Serial interface

### WARNING

#### Geräte an Servicebuchse

- An die Servicebuchse dürfen außer dem Serial Spot Meter und dem Universal Serial Luminance Meter keine anderen Geräte angeschlossen werden
- Das Anschließen und Entfernen eines Gerätes darf nur durch den Service oder durch Personen, die vom Service eingewiesen wurden, geschehen.
- Im Beisein der Patienten dürfen Serial Spot Meter und Universal Serial Luminance Meter nicht angeschlossen sein.

Der PDC0100 hat zwei serielle RS 232-Schnittstellenbuchsen:

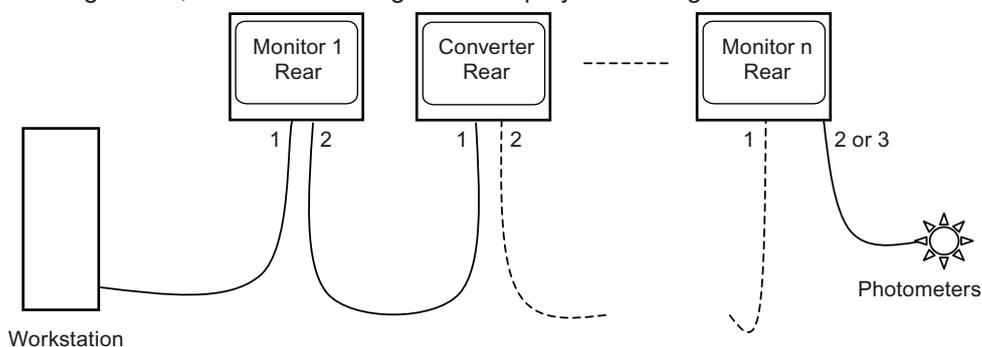
- **Upstream (vorgeschaltet) RJ11-Buchse:**

Die Buchse befindet sich direkt neben der VGA-Buchse (beschriftet mit "UP").

- **Downstream (nachgeschaltet) RJ11-Buchse:**

Die Buchse befindet sich direkt neben der ersten RJ11-Buchse (beschriftet mit "Down").

Die Buchse ermöglicht den seriellen Bus-Betrieb zur Integration des Analog-DVI-Konverters in bestehende Systeme (Busverbindungen). Des Weiteren besteht die Möglichkeit, über Remote-Zugriff die Displayeinstellungen zu verändern.



## 6 Commissioning

### 6.1 Switch on the device

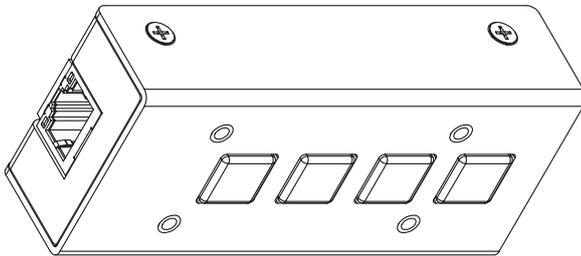
The device does not have a power switch, and is switched on and off using the power supply unit.

If the device is supplied with current, the green operation LED "Power" lights up.

### 6.2 Keypad

#### The Analog DVI Converter is set using a keypad

- Only connect the keypad using the supplied cable.



#### **CAUTION**

##### Network

- The Analog DVI Konverter PDC0100 must not be connected to a network.
- The RJ45 socket on the PDC0100 and the keypad are used exclusively to connect these together using the network cable supplied with the keypad.

The operation LED is located directly on the PDC0100. The 4-key keypad is connected to the PDC0100 via a network cable.

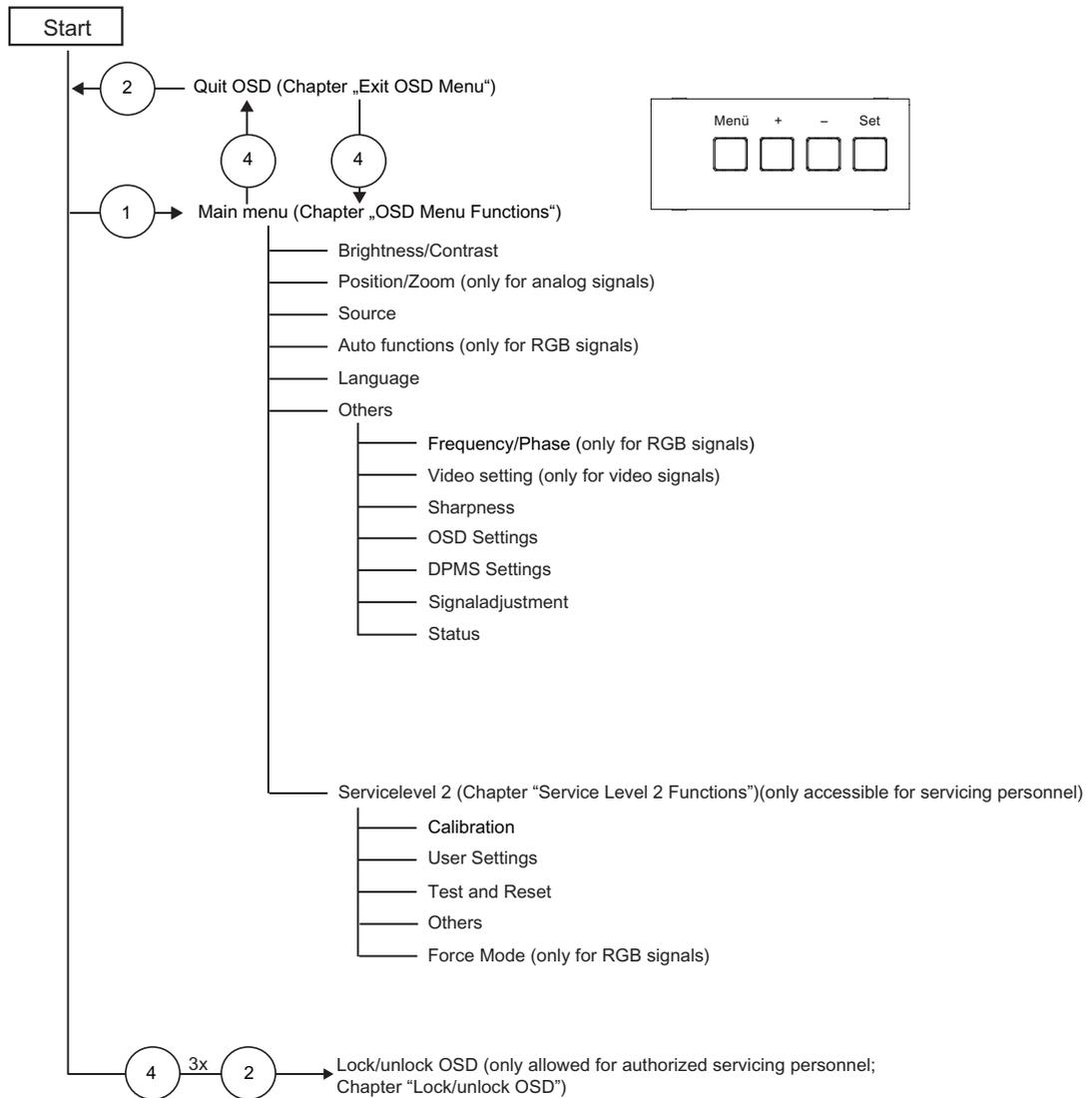
#### Key functions

In the OSD menu, the keys have the following functions:

Key	Situation	Action
1 (≙ Menu)	Always	Scrolling
2 (≙ +)	Submenu is selected	Select submenu
	Function is selected	Increase/change value
3 (≙ -)	Function is selected	Decrease/change value
4 (≙ Set)	Apart from in the "Exit OSD" menu	Return to previous menu level (settings are retained)
	In the "Exit OSD" menu	Return to main menu (settings are retained)

## 6.3 OSD overview

The OSD menu is used to make settings for operation of the monitor with a source. The OSD can also be operated without an input signal to a limited extent.



## 6.4 Main menu

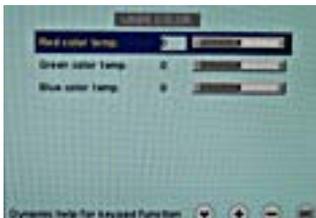


## 6.5 Menu "Brightness/contrast"



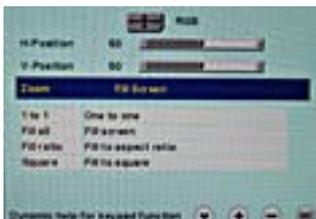
Function	Values	Description
<b>Brightness</b>	0 ... 100 %	<p><b>Set brightness</b></p> <p>Adapting the representation of darker picture areas.</p> <p><b>Note:</b> The brightness settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).</p>
<b>Contrast</b>	0 ... 100 %	<p><b>Set contrast</b></p> <p>Adapting the representation of brighter picture areas.</p> <p><b>Note:</b> The contrast settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).</p>
<b>Color</b>	1, 2, 3, User 1: 9300°K 2: 7300°K 3: 6500°K (native) User factory setting: "6500 °K (native)". This color can be set by the user. <i>Default: 1 (6500°K)</i>	<p><b>Set the desired color temperature or hue</b></p> <p>Three fixed color temperatures and one adjustable color temperature can be selected.</p> <p>Color locations 1 and 3 cannot be saved. They only remain active while the timing is applied.</p> <p><b>Note:</b> The user color setting can be changed when "User" is selected.</p>

## Menu "User color"



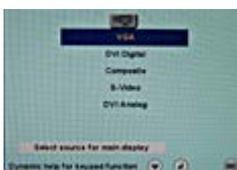
Function	Values	Description
<b>Define user color temperature</b>		
The color setting defined here can be subsequently selected using the color function (selection "User").		
<b>Note:</b> If the color location setting is corrected with "User color", some color levels may be lost.		
→Red color temp.	-32 ... +32	Select red component of monitor
→Green color temp.	-32 ... +32	Select green component of monitor
→ Blue color temp.	-32 ... +32	Select blue component of monitor

## 6.6 Menu "Position/zoom" (only for analog signals)



Function	Values	Description
<b>H position</b>	0 ... 100 %	<b>Shift picture in horizontal direction</b> With identical monitor and graphics card settings, the complete picture to be displayed fills the display area of the monitor with the exact number of pixels.
<b>V position</b>	0 ... 100 %	<b>Shift picture in vertical direction</b> With identical monitor and graphics card settings, the complete picture to be displayed fills the display area of the monitor with the exact number of pixels.
<b>Zoom</b>	1 to 1 Fill all Fill ratio Square <i>Default: Fill all</i>	<b>Selection between different picture size settings:</b> <ul style="list-style-type: none"> <li>• <b>1 to 1:</b> The picture is displayed on screen with its original resolution.</li> <li>• <b>Fill all:</b> The picture is displayed to fill the complete screen (1280 x 1024 pixels).</li> <li>• <b>Fill ratio:</b> The picture is zoomed to the maximum screen area with retention of the aspect ratio.</li> <li>• <b>Square:</b> The picture is zoomed to square format.</li> </ul>

## 6.7 Menu "Source"

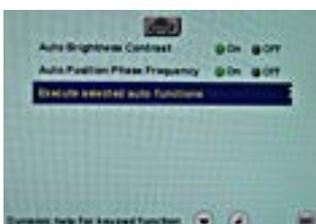


Function	Values	Description
<b>Select source for main monitor</b>	VGA DVI Digital Composite S-Video DVI Analog	<b>Selection of source for full format image</b> If you call this OSD menu, the current source is displayed. After switching the monitor off and on again, the sources are queried in sequence.

## 6.8 Menu "Auto functions"

### Note

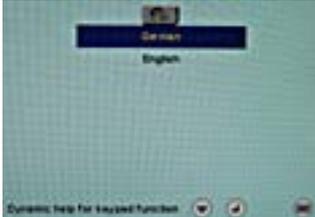
- The auto functions support automatic adjustment of the parameters. The quality of the settings depends on the picture contents and the type of synchronization.
- EIZO recommends that an SMPTE test picture is displayed.
- All settings can also be optimized manually using the corresponding functions in the OSD menu.



Function	Values	Description
<b>Auto brightness/contrast</b>	On / Off <i>Default: On</i>	<b>This parameter can be selected for the auto function</b> With "On", the brightness and contrast are adjusted when the "Auto functions" are executed. With "Off", the brightness and contrast are not adjusted when the "Auto functions" are executed. <b>Note:</b> This function is not available for "Sync on green signals".
<b>Auto position/phase/frequency</b>	On / Off <i>Default: On</i>	<b>This parameter can be selected for the auto function</b> With "On", the position, phase and frequency are adjusted when the "Auto functions" are executed. With "Off", the position, phase and frequency are not adjusted when the "Auto functions" are executed.

Function	Values	Description
<b>Execute selected auto functions</b>	Execute	<b>The selected auto functions are executed</b> This sets brightness, contrast, position, frequency and phase to their optimum values. The quality of the function depends on the applied image contents.

## 6.9 Menu "Language"

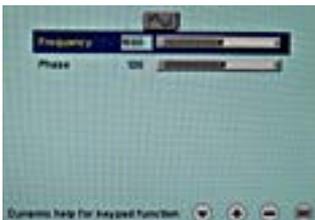


Function	Values	Description
	English, German <i>Default: English:</i>	<b>Select the language of the OSD menu</b> German or English can be selected.

## 6.10 Menu "Others"

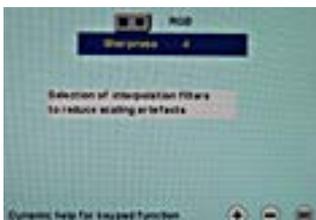


### Menu "Frequency/phase" (only for analog signal)



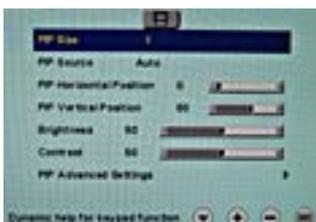
Function	Values	Description
<b>Frequency (only for RGB signals)</b>	1638 ... 1770	<b>Setting the frequency and phase of the input signal</b> If the vertical lines are still slightly fuzzy, adjust the "Frequency/Phase" setting. <b>Note:</b> We recommend that a vertical line from the "Pixel On/Off" test pattern is displayed.
<b>Phase (only for RGB signals)</b>	0 ... 255	

## Menu "Sharpness"



Function	Values	Description
Interpolation filters	1 ... 5	<p><b>Filters for setting the sharpness, in order to reduce scaling artefacts.</b></p> <p>You must visually determine which sharpness setting is best. Common filters are available for the RGB sources (VGA, DVI).</p> <p>The interpolation filters depend on the input resolution. A filter is not normally used with 1280 x 1024 since each physical pixel can be controlled individually by its own pulse. At lower resolutions, the filter calculates the value for the non-controlled pixels.</p> <p>The larger the filter number (No. 1, 2, ...5), the finer/deeper the calculation, i.e. the picture appears smoother and more details are lost.</p> <p>Set the filter depending on the application:</p> <p>Filter No. 1 produces the "sharpest" picture, as it does the least filtering.</p> <p>Filter No. 5 filters the most; the greatest danger exists with this filter that details can no longer be recognized.</p>

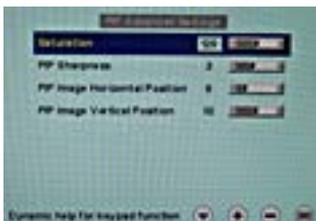
## Menu "Video/PIP setting"



Function	Values	Description
PIP size	Off 1 2 3 <i>Default: Off</i>	Activating and deactivating the PIP window and setting the PIP window size.

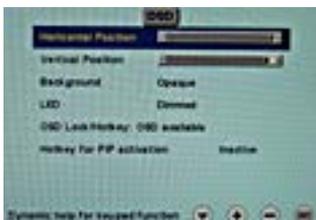
Function	Values	Description
<b>PIP source</b>	Auto VGA DVI Digital Composite S-Video DVI Analog SoG / H / V <i>Default: Auto</i>	<b>The source is selected that is to be shown in the PIP window.</b>  "VGA" and "DVI" or "SoG / H / V" cannot be displayed simultaneously. <b>Note:</b> When an RGB signal is displayed in the PIP window, resolutions of up to 1280 x 1024 can be displayed in PIP size 3 and 800 x 600 in PIP size 2.  The PIP window remains black if the signal cannot be displayed. To display the signal: <ul style="list-style-type: none"> <li>• Reduce the resolution of the signal</li> <li>• Change "PIP size"</li> </ul>
<b>PIP horizontal position</b>	Slider	Shift the PIP window in the horizontal direction.
<b>PIP vertical position</b>	Slider	Shift the PIP window in the vertical direction.
<b>Brightness</b>	0 ... 100 %	<b>Adjust the brightness of the PIP window</b>  Adapting the representation of darker picture areas. <b>Note:</b> The brightness settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).
<b>Contrast</b>	0 ... 100 %	<b>Adjust the contrast of the PIP window</b>  Adapting the representation of brighter picture areas. <b>Note:</b> The contrast settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).

### Menu "PIP advanced settings"



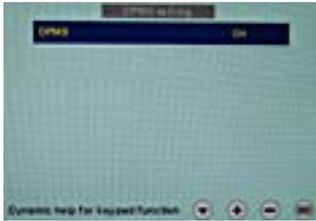
Function	Values	Description
<b>Saturation</b>	1 ... 255 <i>Default: 128</i>	Adjusting the saturation for video signals displayed in PIP.
<b>PIP sharpness (only for analog signal)</b>	1 ... 5	<b>One of 5 filters can be selected for setting the sharpness of the PIP image in order to reduce scaling artefacts.</b>  You must visually determine which sharpness setting is best.
<b>PIP image horizontal position (only for analog signal)</b>	Slider	Shift the image in the horizontal direction in the PIP window.
<b>PIP image vertical position (only for analog signal)</b>	Slider	Shift the image in the vertical direction in the PIP window.

## Menu "OSD setting"



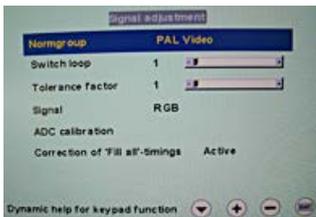
Function	Values	Description
<b>Horizontal Position</b>	Slider <i>Default: Right</i>	Setting of horizontal position of OSD menu
<b>Vertical Position</b>	Slider <i>Default: Down</i>	Setting of vertical position of OSD menu
<b>Background</b>	Opaque Transparent <i>Default: Opaque</i>	Selection of OSD background (Opaque or Transparent).
<b>OSD Lock/Hotkey</b>	Hotkey brightness / contrast Hotkey select source <i>Default: OSD available</i>	<p><b>Selection of different OSD lock/hotkey settings:</b></p> <ul style="list-style-type: none"> <li>Hotkey brightness / contrast: The OSD menu is locked and can only be unlocked using a specific key combination. Only the brightness and contrast can be changed by any user with the OSD keys without the need for a key combination.</li> <li>Hotkey select source: The OSD menu is locked and can only be unlocked using a specific key combination. Only the source can be changed by any user with the OSD keys without the need for a key combination.</li> </ul> <p>See also <a href="#">Lock/unlock OSD menu [▶ 32]</a>.</p>
<b>Hotkey for PIP activation</b>	Active Inactive <i>Default: Inactive</i>	<p><b>Activating and deactivating the PIP window with button 4 on the front</b></p> <p>If "Active" is selected, the PIP window can be opened or closed with the saved settings using button 4 on the front without opening the OSD menu.</p>

### Menu "DPMS setting"



Function	Values	Description
DPMS	On Off <i>Default: On</i>	<b>The DPMS (Display Power Management System) can be switched on/off</b> When the DPMS is activated and there is no input signal, the backlight is switched off or darkened. This saves power, and increases the service life of the backlight.

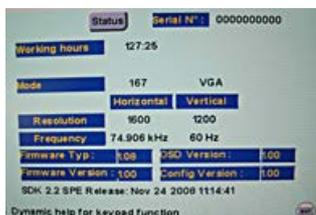
### Menu "Signal adjustment"



Function	Values	Description
Normgroup: PAL Video/PAL RGB/VRC VIDEO/VCR RGB		
<b>Switch loop</b>	1 ... 200 <i>Default: 1</i>	The following four parameters are of relevance for this tool: <ul style="list-style-type: none"> <li>• H frequency</li> <li>• V frequency</li> <li>• V-total</li> <li>• Interlaced/non Interlaced</li> </ul> <p>If one of these parameters changes, the monitor treats it as a timing change and initiates resynchronization via an "Auto in progress". To prevent this from happening as a result of each and every minor signal disturbance, the value representing the permissible number of faulty or changed frames must be increased in the case of unstable signal sources.</p> <p><i>Disadvantage:</i> The higher the tab setting, the longer it will take for a desired timing change to occur (delayed by a number of milliseconds).</p>
<b>Tolerance factor</b>	1 ... 10 <i>Default: 1</i>	<b>This tool only considers the H and V frequencies.</b> An increase in the tab value results in a larger tolerance band being defined. Minor frequency fluctuations within this range will not result in resynchronization ("Auto in progress").

Function	Values	Description
Signal (only for analog signal)	RGB Monochrome <i>Default:</i> RGB	<b>Switch over signal between b/w and color operation</b> <ul style="list-style-type: none"> <li>If a monochrome signal arrives, it is green on the color monitor.</li> <li>To obtain correct b/w images, set the "Signal" parameter to monochrome.</li> </ul>
ADC calibration	Execute	<b>Automatically calibrate A/D converter for the applied video level</b> <p>The video level range of the system is checked, and the monitor set accordingly. This results in optimum adjustment of the individual RGB A/D converters to the video source.</p> <p>The calibration results in a larger and more flexible video level range (e.g., the full brightness is also achieved at 700 mV if the video level is limited at this value).</p> <p><b>Note:</b> A specific test pattern and timing are prerequisites!  The A/D converters have already been factory-set and need not be readjusted.</p>
Correction of "Fill all" timings	Active Inactive	Enhances the DVI-D signal quality over long distances, even when standard cable is used

## Menu "Status"



Function	Values	Description
Status	Information	<b>Current monitor settings in the respective picture mode can be called here.</b> <ul style="list-style-type: none"> <li>Operating hours of the monitor</li> <li>OSD version</li> <li>Configuration version</li> <li>Current timing</li> <li>Current source</li> <li>Screen resolution</li> <li>Frequency of the input signal (line frequency and refresh rate)</li> </ul>

## 6.11 Servicelevel 2 functions

### NOTICE

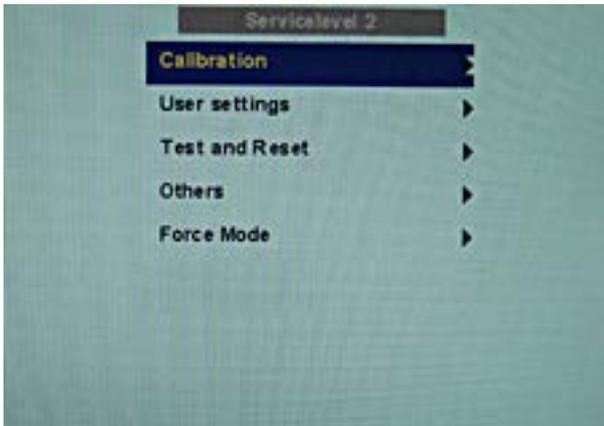
Only servicing personnel should have access to "Servicelevel 2."

The "Servicelevel 2" menu can be accessed from the OSD main menu.

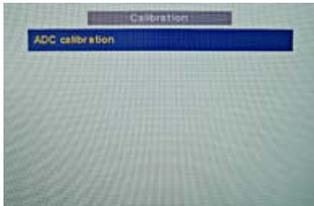
### Key combination for opening "Servicelevel 2"

- Briefly press the Up key and immediately keep the Down key pressed.

### Menu structure

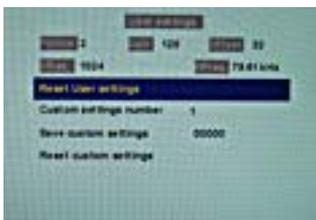


### Menu "Calibration"



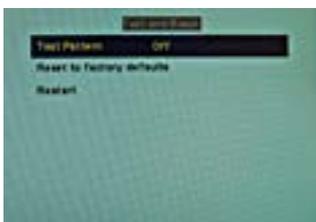
Function	Values	Description
ADC calibration	Execute	<p><b>Automatically calibrate A/D converter for the applied video level</b></p> <p>The video level range of the system is checked, and the monitor set accordingly. This results in optimum adjustment of the individual RGB A/D converters to the video source.</p> <p>The calibration results in a larger and more flexible video level range (e.g., the full brightness is also achieved at 700 mV if the video level is limited at this value).</p> <p><b>Notice:</b> A specific test pattern and timing are prerequisites! The A/D converters have already been factory-set and need not be readjusted.</p>

## Menu "User settings"



Function	Values	Description
<b>Reset User settings</b>	Execute	All automatically stored timing data are deleted
<b>Custom settings number</b>	1 ... 5	A total of 5 custom settings can be generated. The digit is the code number for the memory location.
<b>Save custom settings</b>		Press the "Up" key to save the current picture settings and timing data to the memory addresses specified via the "Custom settings number".  The 5-digit combination indicates which individual memory addresses have been allocated.  <i>Example:</i> 10010 ⇒ Addresses 1 and 4 have been allocated.
<b>Reset custom settings</b>	Execute	Clears the content of the five memory locations

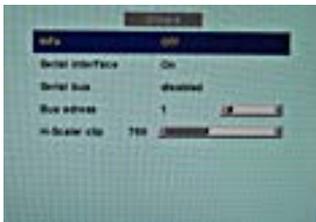
## Menu "Test and Reset"



Function	Values	Description
<b>Test pattern</b>	Off Color bars Gray bars Calibration picture <i>Default: Off</i>	<b>Fixed test patterns are available</b>  The test patterns are generated directly in the monitor's processor. The test patterns can be used to analyze whether a fault is present in the control electronics or has to be searched for in the plugs/cables or video source.  <ul style="list-style-type: none"> <li>If the test pattern is displayed without faults, one should first check the connections and video sources.</li> <li>If the video source and the connections are OK, and if the test pattern is displayed perfectly, the fault must be searched for in the video input range of the monitor.</li> </ul> The test patterns can also be used to check the panel quality: <ul style="list-style-type: none"> <li>Proof of the contrast with grayscales and color channels (independent of picture, picture program, graphics card and connectors).</li> <li>All the pixels on the display area are activated (exception: The first column on the left of the panel remains black). Test of columns or line driver.</li> </ul>

Function	Values	Description
<b>Reset to factory defaults</b>	Execute	<p><b>All parameters are reset</b></p> <p>The following are deleted:</p> <ul style="list-style-type: none"> <li>• User settings</li> <li>• Custom settings</li> </ul> <p>The following are reset:</p> <ul style="list-style-type: none"> <li>• Backlight</li> <li>• Sharpness</li> <li>• User color location</li> <li>• Signal adjustments</li> <li>• Black level settings</li> <li>• RGB relation</li> <li>• DPMS settings</li> <li>• Language</li> <li>• OSD setting</li> <li>• Gamma curve</li> <li>• Normgroup</li> <li>• Info window settings</li> <li>• Serial interface settings</li> <li>• H-Scaler clip</li> </ul>
<b>Restart</b>	Execute	<p><b>The processor is reset</b></p> <p>The power supply unit is not switched off. The monitor restarts.</p>

### Menu "Others"

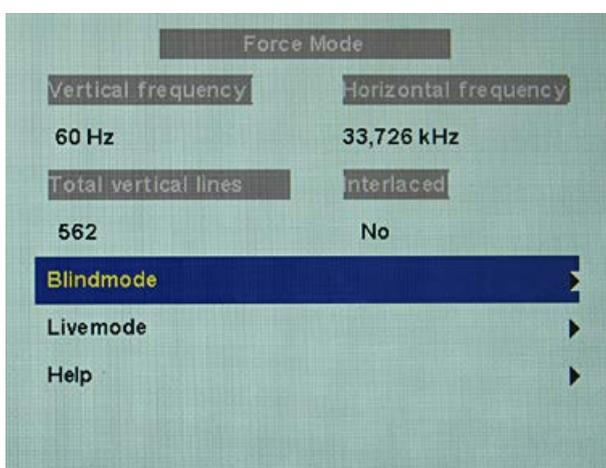


Function	Values	Description
<b>Info</b>	On Off <i>Default: Off</i>	<p><b>To display an info window</b></p> <p>The info window is displayed on the bottom right of the screen if the source changes. It provides more detailed information about the set timing.</p>
<b>Serial interface</b>	On Off <i>Default: On</i>	<p><b>The serial interface can be activated or deactivated.</b></p> <p>If the serial interface is deactivated ("Off"), it is possible to suppress e.g. the downloading of firmware.</p>
<b>Serial bus</b>	Enable Disabled <i>Default: Disabled</i>	<p><b>To configure a network of several monitors</b></p> <p>This function is used to interconnect several monitors so that they can all be calibrated using a single computer (connected to the first monitor). See also <a href="#">Serial interface [▶ 16]</a></p>

Function	Values	Description
Bus address	Slider from 0 ... 10 <i>Default: 1</i>	Definition of bus address for monitor.
H-Scaler clip	Slider from 0 ... 1984	<b>Supports adjustment to the aspect ratio</b> The picture can be expanded or compressed in the horizontal direction.

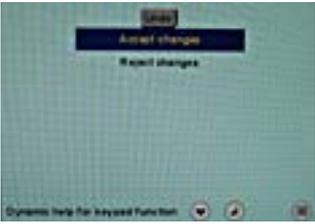
### "Menu Force Mode"

Note
Force Mode is a tool for setting unknown timings that are not displayed via exact modes that have already been stored.



Function	Values	Description
Blind mode	Execute	<b>Force Mode is a tool for setting unknown timings that are not displayed via exact modes that have already been stored.</b> Suitable for the direct input of previously determined Force Mode data. See also <a href="#">Monitor adjustment - Force Mode [▶ 35]</a> .
Live mode	Execute	<b>Force Mode is a tool for setting unknown timings that are not displayed via Exact Modes that have already been stored.</b> Suitable for step-by-step setting of an unknown timing or for fine adjustment of a timing whose data have been entered using "Blind mode". See also <a href="#">Monitor adjustment - Force Mode [▶ 35]</a> .

## 6.12 Exit OSD

	<p>Accept change Reject change</p>	<p>You exit the OSD and can save or reject any changes.</p> <p>Press button 2 if you unintentionally entered this menu and want to return to the main menu.</p> <p><b>Note:</b> If the OSD menu is exited by changing the timing or switching off the monitor, the changes made are saved.</p>
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## 6.13 Lock/unlock OSD menu

<p><b>⚠ CAUTION</b></p> <p><b>Lock/unlock OSD menu</b></p> <p>Locking/unlocking of the OSD is only permissible for authorized servicing personnel. The OSD must be locked if a faulty operation on the part of the user could have a detrimental effect on the approved application of the monitor.</p>
---

### Lock

You can lock the call from the OSD if the OSD is not active.

To lock, enter the following key combination without interruption:

- Press button "4" once and then button "2" three times.

The OSD menu is locked.

### Unlock

- Press button "4" once and then button "2" three times (if the OSD is not active).

Locking of the OSD menu has been canceled.

### Delivery state

The OSD is unlocked.

## 6.14 System settings

### 6.14.1 Implementing settings

The analog DVI converter automatically recognizes many different timings. However, it may be necessary to adjust the detected timing in certain cases. The required operations are explained here.

### 6.14.2 Setting the image geometry

The monitor automatically recognizes the standard used, and has preprogrammed set-up values for each standard. However, depending on the graphics card used, it may still be necessary to align and size the picture for the selected standard.

### 6.14.3 Setting the brightness and contrast

The brightness and contrast must be adjusted for the respective graphics card (different output levels) in the system on site.

<b>Note</b>
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Brightness and contrast can only be set accurately using a photometer.
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<b>Note</b>
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<b>Fine adjustment for analog or digital inputs</b>
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- |   |
|---|
| <ul style="list-style-type: none"><li>• Fine adjustment for analog inputs should only be carried out via the two analog ports (15-pin Sub-D and DVI-I).</li><li>• The digital input (DVI-D) does not require a fine adjustment since the signal display is always optimum. With a fine adjustment, it is possible that gray scales are not displayed.</li></ul> |
|---|

#### Procedure

- Use the SMPTE test pattern.
- Adjust the brightness so that image sections with 5 % and 0 % gray value still visibly contrast.
- Adjust the contrast so that image sections with 95 % and 100 % gray value still visibly contrast. To adapt the luminosity to the ambient lighting, adjust the backlight brightness. Please note that the factory-set brightness is then no longer maintained.

### 6.14.4 Monitor adjustment – video source/graphics card

As with all monitors, the LCD monitor also has certain limits, e.g. maximum resolution and refresh rate.

- The graphics card must be set when using the monitor such that these limits are maintained.

**Note**

**Fine adjustment for analog or digital inputs**

- Fine adjustment for analog inputs should only be carried out via the two analog ports (15-pin Sub-D and DVI-I).
- The digital input (DVI-D) does not require a fine adjustment since the signal display is always optimum. With a fine adjustment, it is possible that gray scales are not displayed.

RGB sources (via 15-pin Sub-D or DVI-I connector) supply analog signals that are basically intended for conventional CRT monitors and that are processed directly by them.

In contrast, the analog signals must be converted into digital signals for the LCD monitor by a video digitizer. Depending on the source, cable length, and video mode (e.g. VGA, SVGA, XGA), this conversion may cause certain deviations which cannot be corrected fully automatically by the monitor.

A manual fine adjustment is therefore necessary during which the monitor (or, more precisely, the video digitizer) is matched to the respective video source.

The fine adjustment includes, for example, setting the horizontal/vertical picture position and the picture sharpness. This can be done via the OSD menu.

In order to optimize the monitor settings for the installed graphics card and guarantee that all gray scales can be distinguished, we recommend that brightness and contrast are adjusted only for the analog inputs.

Please note that these settings have no impact on the calibration in the look up table:

- To reduce the brightness using the OSD operator controls, use a picture with 0% gray scale (black) and a suitable measuring instrument. Wait until the measuring instrument shows constant values. Then increase the brightness slightly until the monitor display is just above the lowest black level (one step is generally sufficient).
- The white value can be set in the same way. Again, use a test pattern with 100% gray value (white). Only the contrast should be adjusted, to ensure that the black value remains unchanged.
- Increase the contrast until you no longer register an increase in light density on the measuring instrument. Then reduce the contrast to slightly below the maximum value (one or two steps are usually sufficient).
- Make sure once again that the black value has not changed. If it should have changed, repeat the two steps described above until the value no longer changes (cause: black value reduction).

The monitor is now configured for optimum performance with the installed graphics card. If you are still not satisfied with the luminance, you can increase the black and white values further by adjusting the backlight in the OSD menu.

**NOTICE**

**Permanently higher setting for backlight**

Please note that a permanently higher setting for the backlight results in a more rapid reduction in the brightness performance toward the end of service life.

## 6.14.5 Monitor adjustment - Force Mode

### Introduction

Various factory-set timings are saved in the monitor. As soon as a video signal is connected, an appropriate timing is sought. "Auto In Process" is displayed during this phase. These timings are compatible with the standard video signals provided by current graphics cards.

If no image or only an unclear image is displayed on the monitor, the signal is outside the standard ranges. Such signals frequently occur with older medical equipment. A timing of this sort can be set using the Force Mode functions.

In many cases, a signal outside the standard ranges is displayed correctly without having to use Force Mode. This is possible because a large number of known timings are saved in the monitor.

Force Mode timings can be saved in the custom settings. Thus, up to five additional Force Mode timings are available.

Only one timing can be saved in Force Mose itself.



Fig.: Force Mode

#### NOTICE

##### **Force Mode is an engineering tool**

Force Mode is only used to determine exotic and unknown timings.

An unknown timing can be used in the monitor with these data.

### Basic information on timing

#### Scanning in the interlaced and non-interlaced procedures

There are two different scanning systems. They differ in the technology used to display the image on the screen TV signals and monitors which are compatible with them are normally set to the interlaced procedure; computer signals and monitors compatible with them are normally set to the non-interlaced procedure. These two formats are not compatible; one of them must first be converted before the signals can be processed together.

In the case of interlaced scanning, each image is divided into two separate fields. An image therefore comprises two fields. An interlaced image is output on the screen in two scans. The horizontal lines of the first field are scanned first, and then, again starting at the top of the image, the horizontal lines of the second field are scanned between the first set of lines. Field 1 consists of the lines 1 to 262 1/2, and field 2 of the lines 262 1/2 to 525. Only a few lines are displayed at the top and bottom of each field.

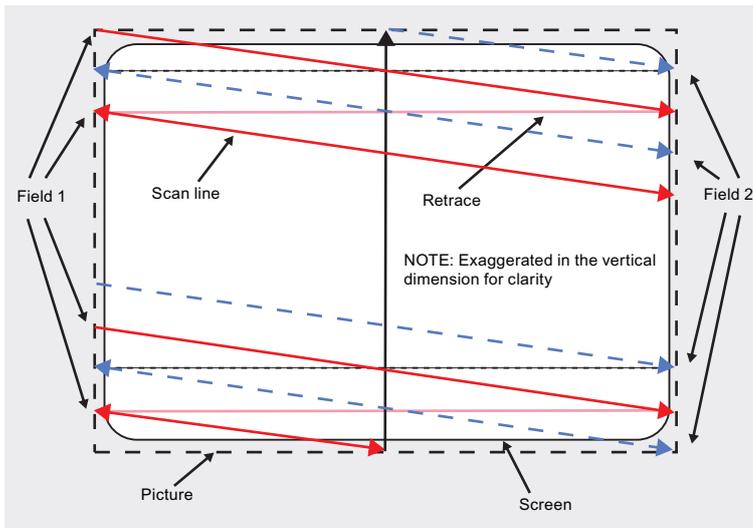


Fig.: Interlaced scanning system

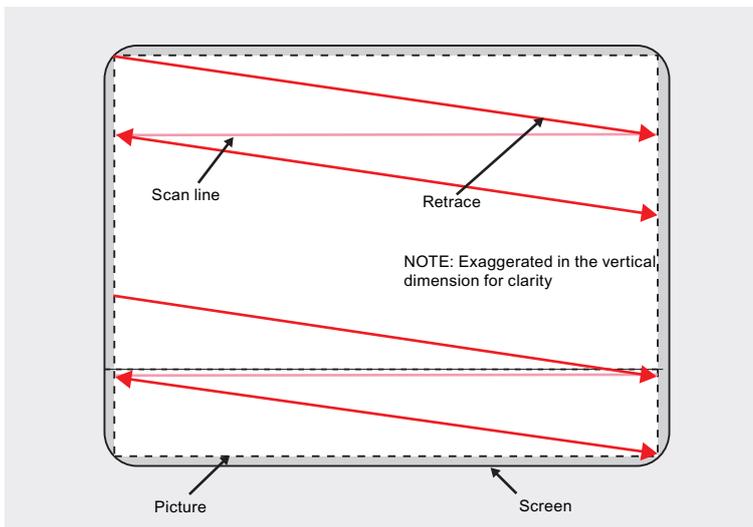


Fig.: Non-interlaced scanning system

A non-interlaced image is output on the screen in that all horizontal lines are scanned from top to bottom in one scan.

### Horizontal timing diagram (the vertical timing diagram is identical)

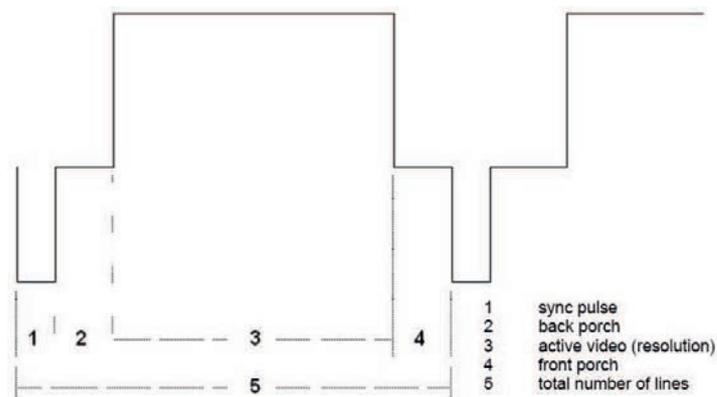


Fig.: Timing diagram

Force Mode menu	Timing diagram
Horizontal resolution	3 - Active video (horizontal resolution)
Vertical resolution	3 - Active video (vertical resolution)
Total horizontal lines	5 – Total number of lines (horizontal)
Horizontal blank pixels	4 – Front Porch (horizontal)
Vertical blank pixels	4 – Front Porch (vertical)

### Blind mode

"Blind mode" is used to enter known or already determined timings. The values to be set have to be known.

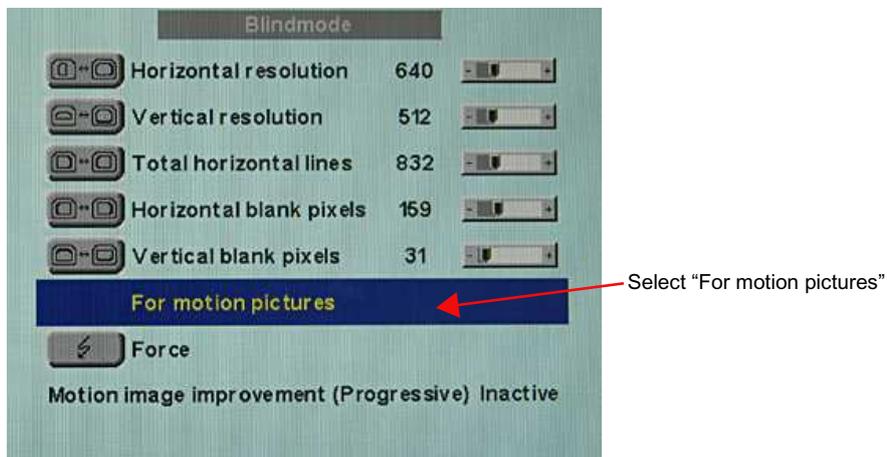
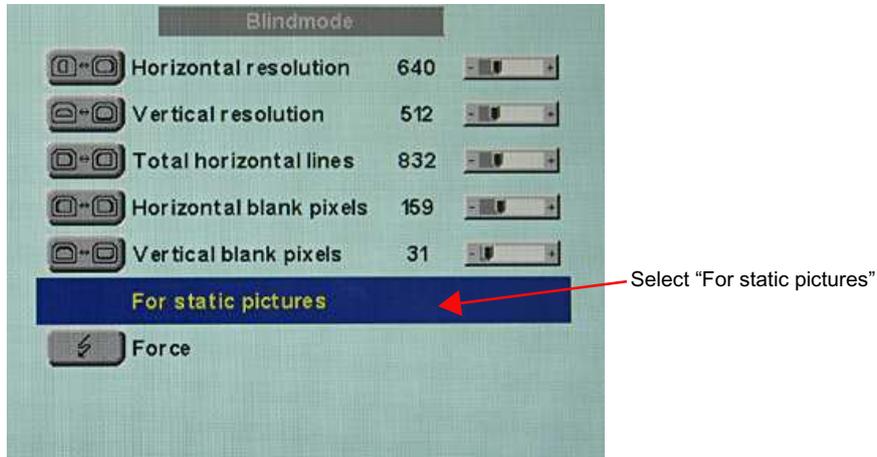
Live mode should be used to set unknown timing data step-by-step.

Note
<p><b>Always save data with "Force"</b></p> <p>The timing data are only entered into memory by the "Force" command, and the image is then displayed with the new parameters.</p>

### Entering known timing data and fine adjustment

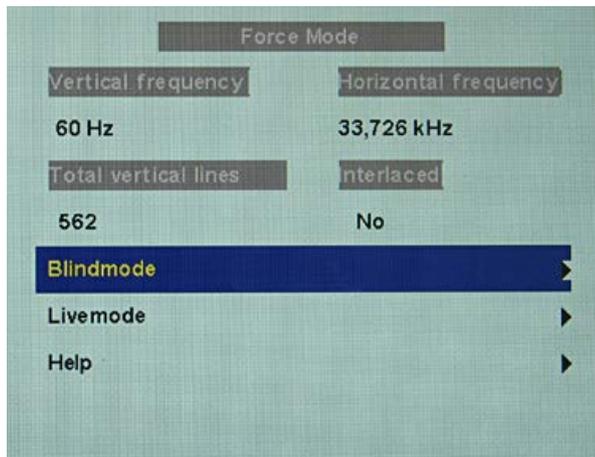
1. Open a test pattern with a clearly defined border (e.g. SMPTE image).
2. Open the "Blind mode" menu: Main menu → Servicelevel 2 → Force Mode → Blind mode.
3. Enter the timing data into the individual input fields using the Menu, Up and Down keys.

- Select either "For static pictures" or "For motion pictures" in line 6 in the "Blind mode" menu and confirm using key 2.

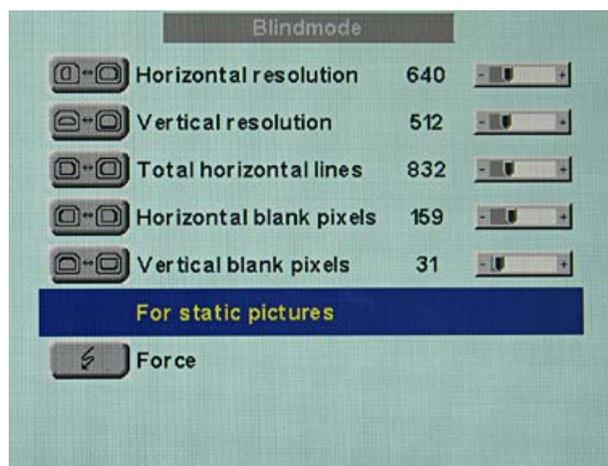


- Execute the "Force"  Force command using key 2.

**Note:** For progressive timings with an image refresh rate greater than 60 Hz, only the items "For static pictures" or "Reset" can be selected in line 6 in the "Blind mode" menu.



**Note:** If the "Reset" setting is selected, all learned values are deactivated in the current Force Mode window.



### Live mode

If a timing is not detected by the monitor or if the image is not satisfactory, a fine adjustment can be performed using "Live mode" or "Position/Zoom" and "Frequency/Phase".

"Live mode" is used for step-by-step approximation of an unknown timing. The changes in the test pattern are output live on the monitor.

#### Note

All settings in "Live mode" must be carried out with the zoom factor "1 to 1" ("Position/Zoom" menu).

#### Note

##### Always save data with "Force"

The timing data are only entered into memory by the "Force" command, and the image is then displayed with the new parameters.

### Known data

If some of the timing data are already known, for example the resolution, they should first be entered in "Blind mode" in order to simplify the next steps.

If the resolution is known, it can be used for the approximation of "Horizontal lines (total)". The following applies: "Horizontal lines (total)" > "Horizontal resolution". If, when setting "Horizontal lines (total)", the "Horizontal resolution" is larger, the latter must be reduced. A larger "Horizontal resolution" can result in the image being split vertically.

### Sequence for setting a timing

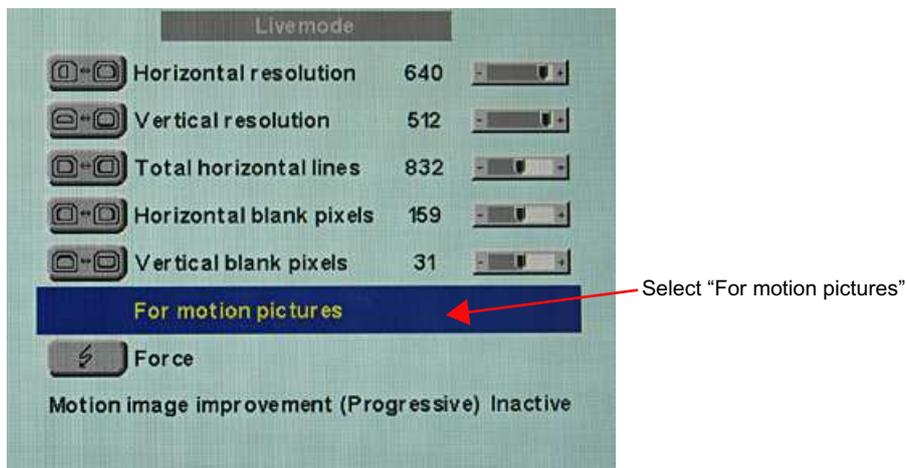
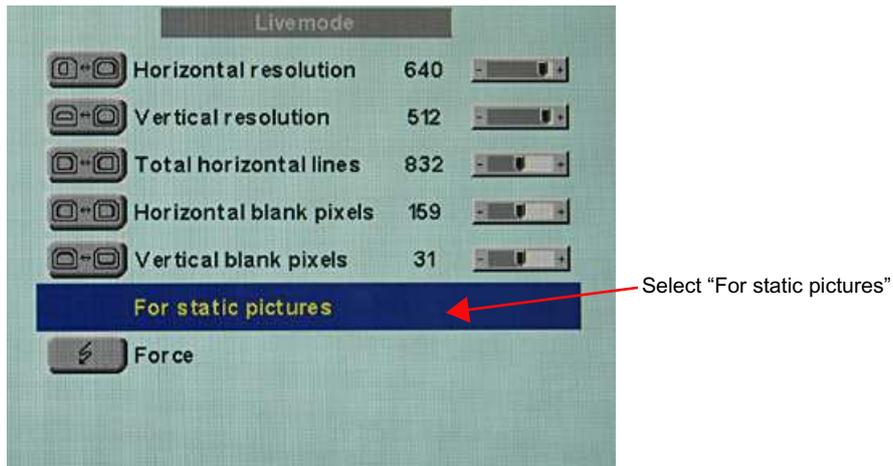
1. Determine start values using auto function
2. Optimize scanning frequency
3. Optimize geometry and resolution

Step-by-step instructions for setting a timing can be found in the next three sections.

### Determine start values using auto function

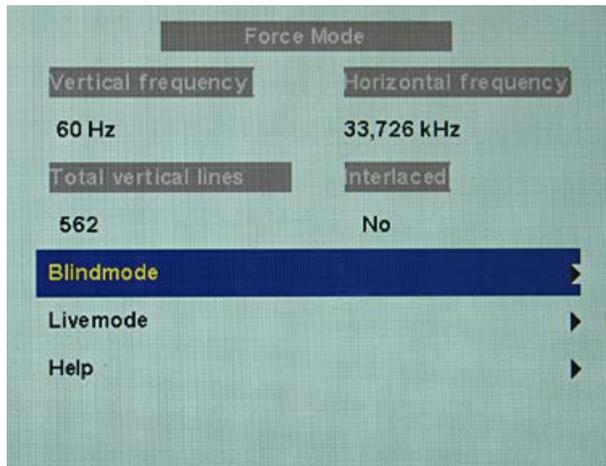
The following commands can be used to trigger automatic determination of the timing data, and provides rough approximation of the applied timing.

1. Open a test pattern with a clearly defined border (e.g. SMPTE image).
2. Open the "Live mode" menu: Main menu → Servicelevel 2 → Force Mode → Live mode.
3. Select either "For static pictures" or "For motion pictures" in the "Live mode" menu and confirm using key 2.

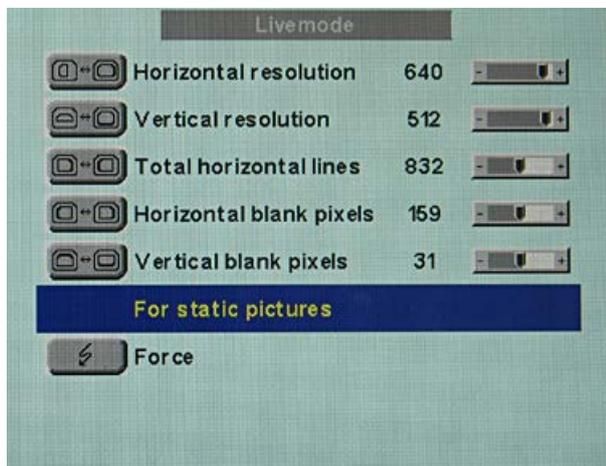


**Note:** For progressive timings with an image refresh rate greater than 60 Hz, only the items "For static pictures" or "Reset" can be selected in the "Live mode" menu.

4. Execute the "Force"  Force command using key 2.



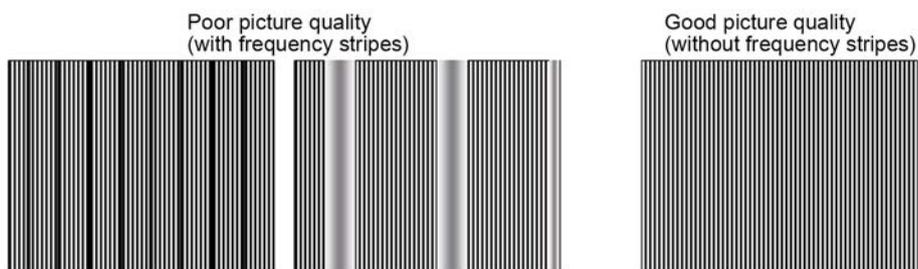
**Note:** If the "Reset" setting is selected, all learned values are deactivated in the current Force Mode window.



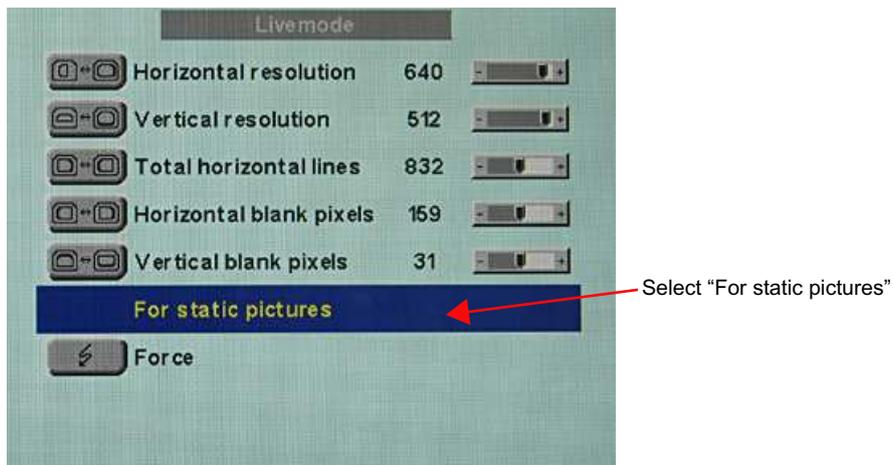
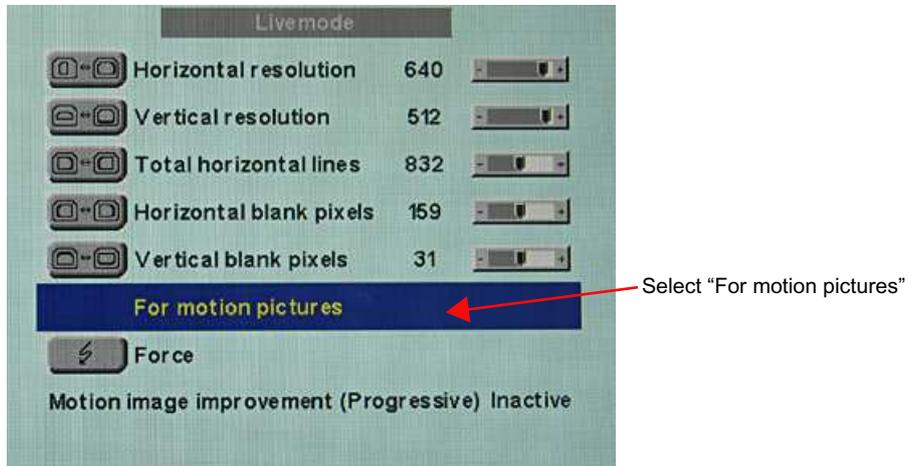
### Optimize scanning frequency

The correct signal frequency must now be set ("Horizontal lines. (total)").

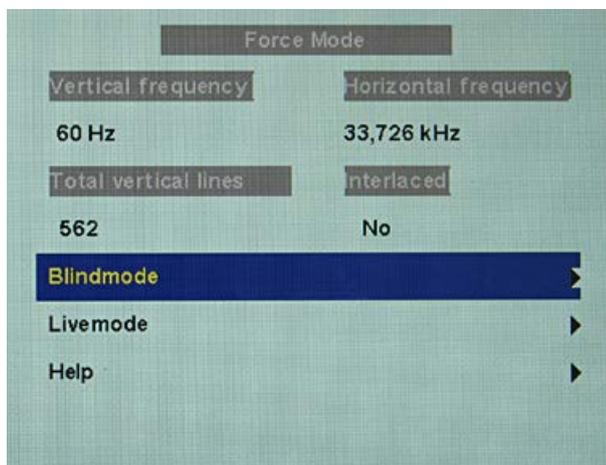
1. In order to set "Horizontal lines (total)" correctly, it is best to use an SMPTE and a pixel on/pixel off test pattern. If the test patterns are not available, you can use an image with clearly defined border and a line written "IIIIIIII" for the setting. Optimize the signal frequency such that no interferences are present in the picture. If the interval between the interferences becomes larger, and these therefore also become fewer, you are moving the slider in the correct direction.



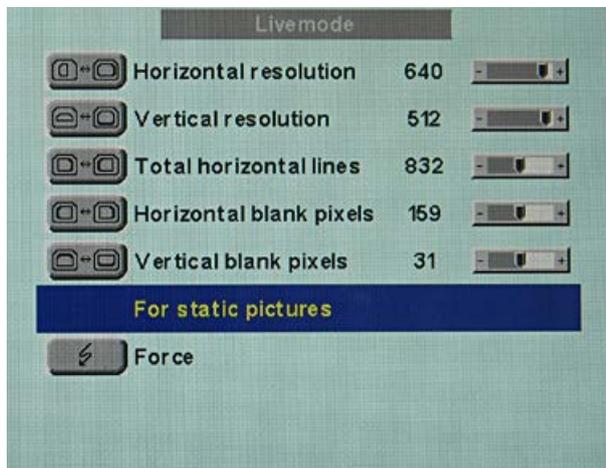
- If you reach the limit of the control range when setting, you must perform the "Force" command with the selection "For static pictures" or "For motion pictures". The current setting is then saved, and the slider set to the center of the control range. Once you have set the signal frequency optimally, you can continue with the adjustment.



**Note:** For progressive timings with an image refresh rate greater than 60 Hz, only the items "For static pictures" or "Reset" can be selected in line 6 in the "Live mode" menu.



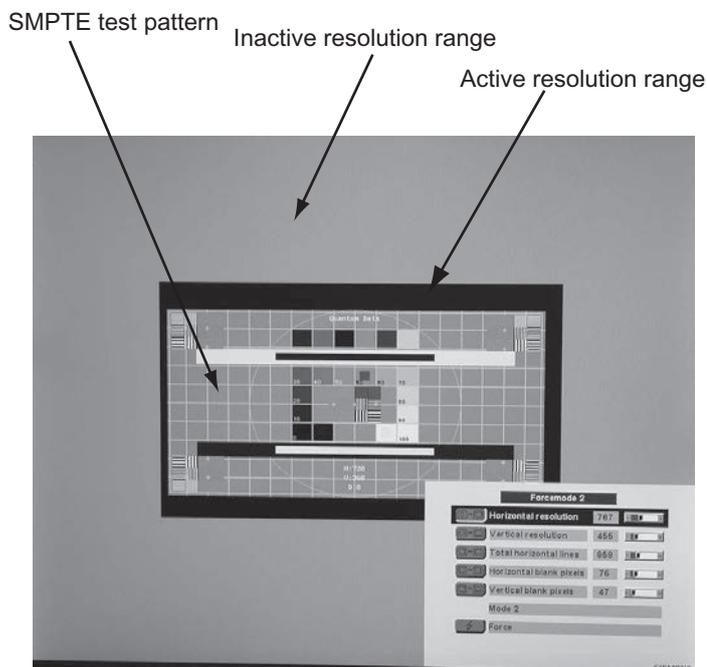
**Note:** If the "Reset" setting is selected, all learned values are deactivated in the current Force Mode window.



### Optimize geometry/resolution

The active resolution range is defined by the values of the "Horizontal resolution" and "Vertical resolution" input fields. This range is displayed in the center of the monitor in black.

The inactive resolution range is the unused range between the active resolution and the maximum resolution of the monitor, namely, 1280 x 1024. In Force Mode, this range is displayed gray (gray scale monitors) or blue (color monitors).



To adapt the active resolution range to the actual video signal resolution, perform the following steps:

1. Open a test pattern with a clearly defined border (e.g. SMPTE image).
2. Open the "Live mode" menu: Main menu → Servicelevel 2 → Force Mode → Live mode.

3. Select either "For static pictures" or "For motion pictures" in line 6 in the "Live mode" menu and confirm using key 2.
4. Use the "Horizontal blank pixels" input field to shift the left edge of the SMPTE image pixel-exact to the left internal border of the gray/blue area.
5. Correct the values in the "Horizontal resolution" input field until the right internal border of the gray/blue area is pixel-exact at the right edge of the SMPTE image.
6. Use the "Vertical blank pixels" input field to shift the top edge of the SMPTE image pixel-exact to the top internal border of the gray/blue area.
7. Correct the values in the "Vertical resolution" input field until the bottom internal border of the gray/blue area is pixel-exact at the bottom edge of the SMPTE image.
8. Execute the "Force"  command with key 2.

**Note: Gray/blue range not visible**

If no gray/blue area is visible on the left and right sides of the image, reduce the "horizontal resolution" until the gray/blue area becomes visible. If no gray/blue area is visible on the top and bottom sides of the image, reduce the "Vertical resolution" until the gray/blue area becomes visible.

**Timing successfully set**

The unknown timing has been successfully set, you can now exit the OSD menu. The monitor will recognize the newly set timing and set it as saved whenever connected.

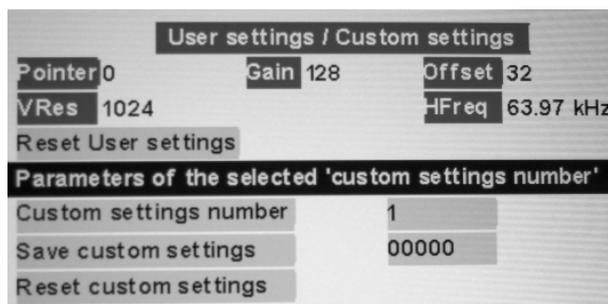
**Note**

Once all settings in Force Mode have been performed, the zoom factor can be set in the "Position / Zoom" menu.

**Saving of several timings**

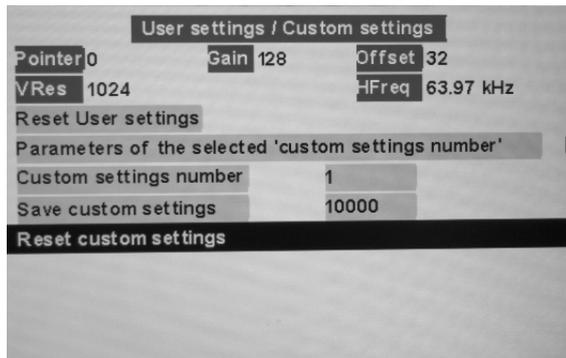
Save the timings in the OSD menu "Servicelevel 2 → User / Custom settings".

Up to five timings can be saved.



1. Select the storage number via "Custom settings number".
2. Save the timing by selecting "Save custom settings" and execute with key 2.
3. The saved timing is now identified by a "1" in "Save custom settings".

The location in the "Save custom settings" number where the 1 is set depends on the selected "Custom settings number". For example, if you have selected "1" as the "Custom settings number", the 1st position of "Save custom settings" is set to "1".

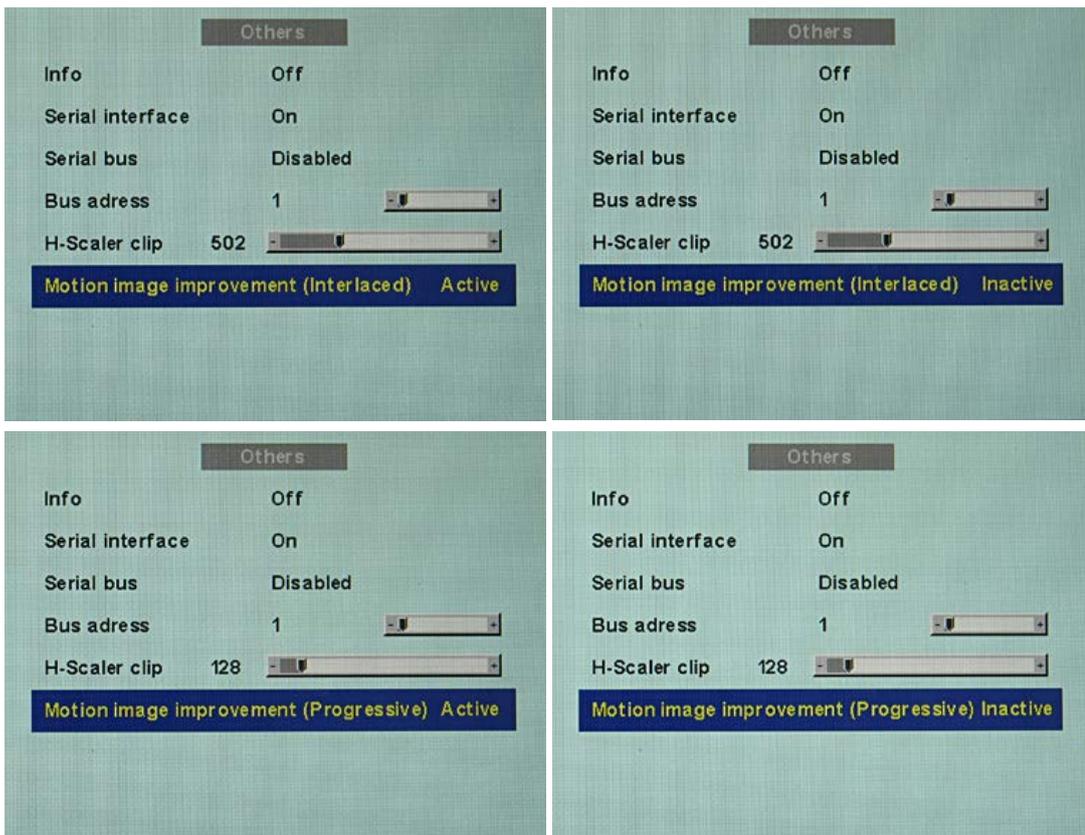


Saved timings can be overwritten at any time.

### Motion image improvement

If the setting "For motion pictures" is selected and "Force" is carried out in the menu "Blind mode" or "Live mode", the menu line "Motion image improvement" is displayed with the setting "Inactive".

If the motion image improvement is to be activated, the setting for this must be changed from "Inactive" to "Active" either in the "Servicelevel 2" → "Others" menu or in the "Blind mode" or "Live mode" of the Force Mode menu.



### **Motion image improvement with interlaced signals**

<b>Note</b>
-------------

With the setting "Motion image improvement" for interlaced signals, the sharpness settings cannot be changed in the "Others" menu.
--

Using the motion image improvement, it is possible to reduce undesirable comb effects in the case of motion images of interlaced signals with PAL and NTSC resolutions connected to the "VGA" and "DVI Analog" signal inputs.

### **Motion image improvement with non-interlaced (progressive) signals**

Using motion image improvement, it is possible to reduce undesirable staircase signals in the case of all non-interlaced signals of up to 60 Hz connected to the "VGA" and "DVI Analog" signal inputs.

<b>Note</b>
-------------

Despite motion image improvement, staircase signals can occur with PIP images of the signal sources "S-Video" and "Composite Video". The staircase signals can occur if a signal source with motion image improvement is active in the main picture.
--

## 7 Operation

### 7.1 Note for users

 <b>CAUTION</b>
<b>Settings must not be changed by users</b> None of the settings may be changed on site by the user. This also applies to settings made using the monitor keys. These are therefore locked for certain applications. Contact Service if settings have to be changed.
 <b>CAUTION</b>
<b>If keys are locked contact service</b> If the keys are locked, contact the service department to unlock them. Unlocking them yourself invalidates the warranty

### 7.2 Switch on the device

The device does not have a power switch, and is switched on and off using the power supply unit.

If the device is supplied with current, the green operation LED "Power" lights up.

## 8 Cleaning

### 8.1 Cleaning

<b>NOTICE</b>
<b>Cleaning and disinfecting</b> <ul style="list-style-type: none"><li>• Remove dust from the device using a dry cloth.</li><li>• Liquid must not penetrate the device</li></ul>

## 9 Troubleshooting

The operation LED continuously lights up green when operating normally. In the event of a fault, localize it as follows, based on the screen display and the operation LED.

1. Check the device for the possible causes listed in the following.
2. Carry out the remedial measures before contacting service personnel.

### 9.1 Troubleshooting

<b>Fault</b>	<b>Cause</b>	<b>Remedy</b>
Power LED off (power supply unit)	Power cable is not inserted or incorrectly inserted.	Connect power cord
Monitor displays no picture, Power LED flashes green	No video signal	Check video cable
	Video source is not outputting a video signal	Check video source
Fuzzy picture, interference in vertical lines	Scanning frequency or phase incorrectly set	Adjust frequency and phase
Image has no contrast	The video source is only transmitting a green signal	In the OSD menu, switch over from "RGB" to "MONO"
The image cannot be shifted horizontally with reference to the panel	Synchronization not OK	Set maximum window size and perform "Auto adjust"

#### Other LED states

<b>LED</b>	<b>Monitor status</b>
Both LEDs light up	No fault; "Power down" was switched on and is active
LED green	Video signal recognized, no fault

## 10 Technical specifications

<b>Note</b>
<b>Applicability of technical specifications</b>
All technical specifications are valid after a warm-up period of 30 minutes.

### 10.1 Power supply

Mains connection	External 12 VDC power supply unit
Line voltage	100 V ... 240 V AC
Line frequency	50 ... 60 Hz ( $\pm 5\%$ )
Power consumption	< 10 W

### 10.2 Electronics

Timing recognition	H frequency, V frequency, interlaced, number of horizontal lines
--------------------	--

### 10.3 Inputs/outputs

#### Analog signal input

RGB input, H/C-Sync input and V-Sync input	Via 15-pin Sub-D connector (female), any polarity
DVI input	Via DVI-I socket (analog pins are used)
RGB signal	Video level: 0,5 ... 1.0 Vpp Sync level: TTL-compatible
SoG signal	Video level: 0,5 ... 1.0 Vpp Sync level: 0,2 ... 0.3 Vpp

#### Video input

S-Video	Via 4-pin mini-DIN socket
Composite	Over 1x BNC socket
Composite & S-Video	Video level: 0,5 ... 1.4 Vpp Sync level: 0,2 ... 0.3 Vpp
Standards	PAL (625 Z / 50 Hz) NTSC (525 Z / 60 Hz)

### Digital output

DVI output	DVI – socket (digital), single link
Resolution	640 x 480, 800 x 600; 1024 x 768, 1280 x 1024
V frequency	60 Hz, 75 Hz
Color depth	32 bit

### Keypad connection

Remote control cable	RJ45 socket on analog DVI converter and keypad to connect these together. Optional settings on the analog DVI converter can be made via this socket.
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### Serial interface

RS 232	Via RJ 11 socket
--------	------------------

## 10.4 Controls and connectors

Front	12 V connection Operation LED 1x RJ45 socket for connection of keypad 1x DVI socket (only digital)
Rear	1x DVI socket 1x 15-pin 3-row Sub-D socket 1x BNC socket 1x 4-pin mini-DIN socket 2x RS 232 sockets (RJ11) Voltage source for connection of external devices (5 V/1 A)
Keypad	1x RJ45 socket for connection of keypad

## 10.5 Mechanical design

Housing components	Powder-coated metal parts
Ventilation openings	In rear panel
Degree of protection	IP20 in accordance with DIN 40050
Connector panel	At front and rear
Weight	<ul style="list-style-type: none"> <li>• Analog DVI converter: 850 g</li> <li>• Keypad: 90 g</li> </ul>
Dimensions (W x H x D) in mm	<ul style="list-style-type: none"> <li>• Analog DVI converter: 220 x 43 x 170</li> <li>• Keypad: 100 x 24.5 x 43</li> </ul>

## 10.6 Climatic conditions

### Operation

Temperature range	5 °C ... 40 °C ambient temperature
Temperature gradient	5°C/h max., no condensation
Air pressure	700 ... 1060 hPa

### Transport and storage (packed)

Temperature range	-20°C ... +70°C ambient temperature
Temperature gradient	5°C/h max., no condensation
Air pressure	500 ... 1060 hPa

## 10.7 Sicherheitsbestimmungen



This product has been assigned a CE marking in compliance with the stipulations of EU directives 2014/30/EU, 2014/35/EU, and 2011/65/EU.

Safety standards	EN 62368, UL 60950
Approval	CSA C22.2 No. 60950-1, cMETus mark
Protection class	Degree of protection II
Degree of protection according to DIN 40050	IP20

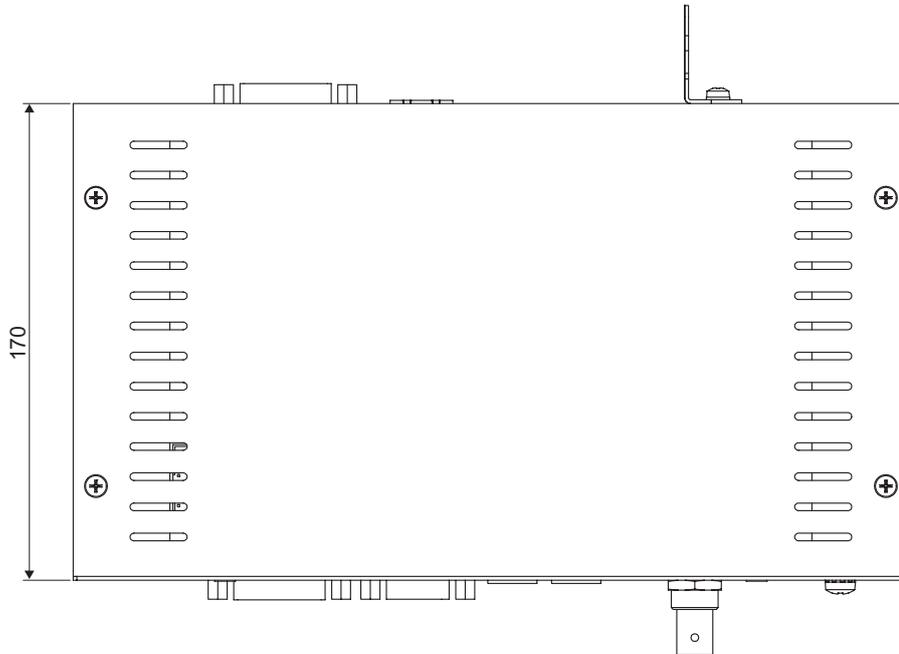
## 10.8 Electromagnetic compatibility

CE conformity	EMC guideline 2014/30/EU
Interference voltage/interference noise	EN 55032, CISPR 32
Voltage fluctuations	EN 610004-11
Burst on power cables	EN 61000-4-4 1 kV
Surge on power cables	EN 61000-4-5 1 kV symmetrical, 2 kV unsymmetrical
Static discharge on casing parts (ESD)	EN 61000-4-2 8 kV air, 4 kV contact
RFI	EN 61000-4-3 80 MHz ... 2.5 GHz, 3 V/m 80 % AM 1 kHz
Noise immunity	EN 61000-4-6 150 kHz ... 80 MHz 3 V/m 80 % AM 1 kHz
Magnetic constant fields	EN 61000-4-8 Max. 4000 A/m
Magnetic alternating fields	EN 61000-4-8 30 A/m

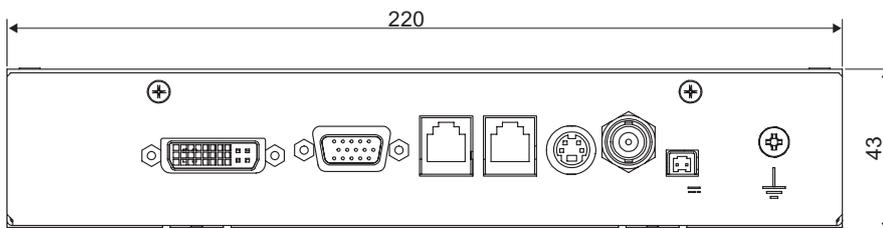
## 11 Dimension drawings

All dimensions in mm

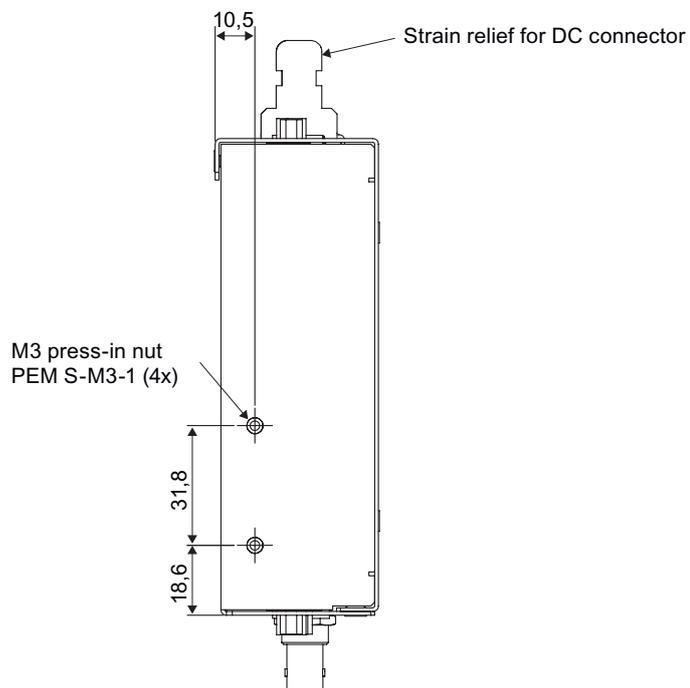
### 11.1 View from above



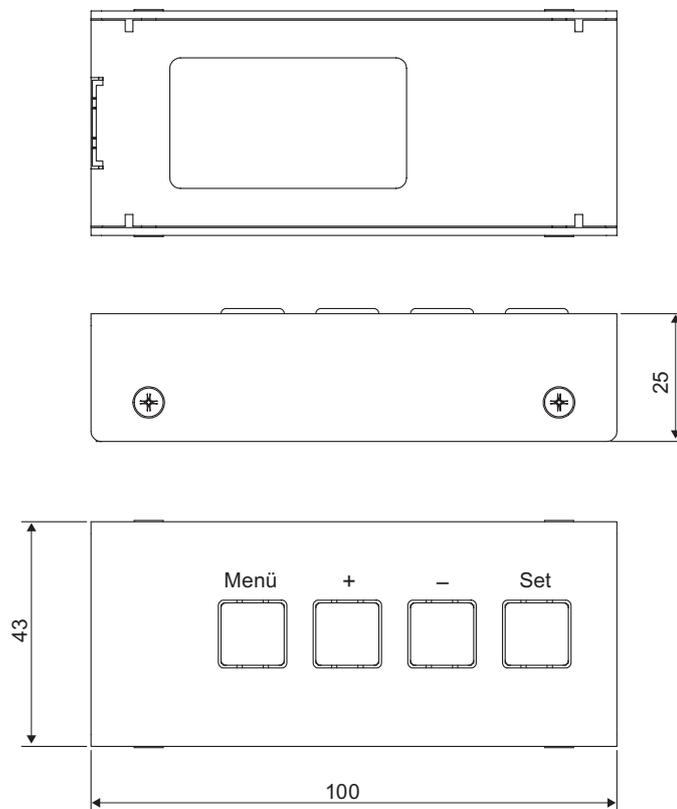
### 11.2 Rear view



### 11.3 View from right



### 11.4 View of keypad



## 12 Spare parts / accessories

### 12.1 Power supply units and Keypad

Product	Order no.
<b>Power supply unit for 1x PDC0100</b> SINPRO Power Supply; Model: MPU15A-105, EU power cable	6GF60100BA030AA0
<b>Power supply unit for 1-4x PDC0100</b> SL POWER™ and AULT®; Model: MW153KB1203F01, EU power cable	6GF60100BA030AA1
<b>Power supply unit for 1x PDC0100</b> SINPRO Power Supply; Modell: MPU15A-105, US power cable	6GF60100BA031AA0
<b>Power supply unit für 1-4x PDC0100</b> SL POWER™ and AULT®; Modell: MW153KB1203F01, US power cable	6GF60100BA031AA1
<b>Keypad with cable</b>	6GF60100BA000AB0

### 12.2 DVI transmission link

#### Note

If the monitor is not designed for a 5 V/1 A power supply, a power supply unit is required for the DVI transmission link.

Digital graphics connection supports the transmission of high-quality video data. Using the TDL DVI link set from EIZO, this data can be transmitted over a distance of up to 36 m without any reduction in quality.

The transmission set comprises a receiver and a transmitter that are connected over the CAT cable. This medium is widely implemented, rugged in use and the cables are easy to connect. The plugs at each end are small enough to pass through narrow pipes.

Product	Order No.
TDL3600 DVI transmission link, 36 m without power supply unit	6GF60100DA36
TDL3600 DVI transmission link, 36 m with power supply unit	6GF60101DA36
TDL2300 DVI transmission link, 23 m with power supply unit	6GF60101DA23

## 12.3 Cables and adapters

### Cables and adapters

Different cables and adapters allow problem-free integration of our monitors, even in extremely complex systems.

Product	Order No.
DVI-HDMI-Kabel, 5 m	6GF69801HA00
BNC to VGA cable	6GF69801TB04
UMC-201, USB serial converter	6GF69808WG15

## 13 Appendix

### 13.1 Markings and symbols

The markings and symbols on the device indicate the following:

Marking/symbol	Description
	Symbol for "Caution, observe accompanying documents".
	CE marking (EU conformity mark).
Electrical Safety 	MET marking, in accordance with U.S. and Canadian national regulations.
	RCM marking for conformity with Australian and New Zealand EMC standards.
	Symbol for date of production for medical products.
	WEEE marking: Product must be disposed of separately; materials may be recycled.
	Marking according to ACPEIP (China-RoHS).
	Symbol for "Comply with the instructions for use".
	Symbol for "Authorized service personnel only".

## 13.2 China RoHS (Restriction of Hazardous Substances)

### Model: PDC0100

根据SJ/T11364-2014《电子电气产品有害物质限制使用标识要求》特提供如下有关污染控制方面的信息。

The following product pollution control information is provided according to SJ/T11364-2014 Marking for the restriction of the use of hazardous substances in electrical and electronic product.

### 电子电气产品有害物质限制使用标志说明

#### Explanation of Marking for Restriction of Hazardous Substances



该标志表明本产品不含有超过中国标准GB/T26572-2011《电子电气产品中限用物质的限量要求》中限量的有毒有害物质。该标志还表示本产品废弃后可以回收利用，不应随意丢弃。

This symbol indicates the product does not contain hazardous materials in excess of the limits established by the Chinese standard GB/T26572-2011 Requirements of concentration limits for certain restricted substances in electrical and electronic products. The symbol also signifies that the product can be recycled after being discarded, and should not be casually discarded.

**产品中有害物质的名称及含量****Name and Concentration of Hazardous Substances**

部件名称 Component Name	有毒有害物质或元素 Hazardous substances' name					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电源 Power Supply	○	○	○	○	○	○
其他 电路板 Other Circuit Boards	○	○	○	○	○	○
其他 ( 电缆等 ) Others (cables, etc.)	○	○	○	○	○	○
机架、底盘 Housing, Chassis	○	○	○	○	○	○
附件 ( 信号电缆、输电线等 ) Accessories (signal cable, power line, etc.)	○	○	○	○	○	○

本表格依据SJ/T 11364 的规定编制。  
 ○: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572 标准规定的限量要求以下  
 X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572 标准规定的限量要求

- 此表所列数据为发布时所能获得的最佳信息。
- 由于缺少经济上或技术上合理可行的替代物质或方案，此医疗设备运用以上一些有害物质来实现设备的预期临床功能，或给人员或环境提供更好的保护效果。

This list is based on SJ/T 11364.  
 O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.  
 X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.

- Data listed in the table represents best information available at the time of publication.
- Applications of hazardous substances in this medical device are required to achieve its intended clinical uses, and/or to provide better protection to human beings and/or to environment, due to lack of reasonably (economically or technically) available substitutes.

产品中有害物质的名称及含量 Table of hazardous substances' name and concentration.

**13.3 Environmental protection**

Comply with all local requirements and laws pertaining to the disposal of devices.

The device is in compliance with directive 2011/65/EU for limiting the use of specific hazardous materials in electric and electronic devices.

**13.4 Additional devices**

Connected devices such as PCs must meet the relevant safety standards.

## 13.5 Warranty

Opening of the housing, or electrical or mechanical changes on or in the device, result in cancellation of the warranty. For warranty details, please contact the sales partner from whom you purchased the product. These warranty conditions are neither extended nor limited by the contents of this instruction manual.

## 13.6 Repairs

Please contact the sales partner from whom you purchased the product.

## 13.7 Contact

### Support during installation and for technical questions

[www.eizo-or.com](http://www.eizo-or.com)

## 13.8 Trademarks

The EIZO Logo is a registered trademark of EIZO Corporation in Japan and other countries.

EIZO is a registered trademark of EIZO Corporation in Japan and other countries.

RadiForce is a registered trademark of EIZO Corporation in Japan and other countries.

CuratOR is a registered trademark of the EIZO Corporation.

RadiCS is a registered trademark of EIZO Corporation in Japan and other countries.

RadiNET is a registered trademark of EIZO Corporation in Japan and other countries.

ScreenManager is a registered trademark of EIZO Corporation in Japan and other countries.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

Apple is a registered trademark of Apple Inc.

Macintosh is a registered trademark of Apple Inc.

Mac is a registered trademark of Apple Inc.

VESA is a registered trademark of the Video Electronics Standards Association in the United States and other countries.

HDMI is a trademark or registered trademark of HDMI Licensing, LLC in the United States and other countries.

DICOM is a registered trademark of the National Electrical Manufacturers Association for the publication of standards in the area of digital communication of medical information.

TORX is a registered trademark of Acument Intellectual Properties, LLC.

All other company and product names are trademarks or registered trademarks of their respective owners.

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Instructions for Use, 01/2020  
PDC0100  
1012298-005