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Information about these instructions



Read through these instructions carefully and follow all the information given under all circumstances. You will guarantee reliable operation and a long useful life of your TFT monitor in this way. Always keep these instructions ready to hand, close to your TFT monitor. Keep the instructions safe, in order for you to be able to pass them on to a new owner, in the case of you selling the monitor.

Target group

These instructions are intended for both first times users and those with previous experience.

Service

We are here to support you in your daily use of this monitor.

Please contact us if you have questions or require assistance in operation. You will find a special chapter on the subject of Customer Service, starting on page 18 of these Operating Instructions.

The symbols and signal words used in these Instructions.

	Danger! Observe the regulation to avoid an electric shock. There will be mortal danger.
	Warning! Observe the regulation to avoid physical injury.
	Caution! Observe the regulation to avoid damage to property and devices.
	Important! Further information about the use of the device.

Use in accordance with regulations

- The TFT monitor serves exclusively to reproduce the video signals of external devices, such as computers, for example, of which the connections and image resolutions match the technical data of the TFT monitor given here. Any other use is not in accordance with regulations.
- This device is only suitable for **use in dry internal rooms**.
- This device has only been conceived for **private use**. The device is **not** designed for operation in a **heavy industry business**. Use subject to extreme environmental conditions can result in damage to your device.

Contents

Please check the items received in the box and inform us **within 14 days from purchase** if anything is missing. Your statutory rights are not affected.

You should receive the following items:

- Monitor
- Touch Pen
- DVI cable
- VGA cable
- USB cable
- Audio cable
- Power cord
- User manual
- Warranty card

Safety information

Caution! Pay attention to operational safety.

- The device is not intended to be used by individuals with restricted physical, sensory or intellectual abilities (including children), or a lack of experience and/or knowledge, unless they are supervised by an individual responsible for their safety or have received instructions about how the device is to be used from such a person. Children should be supervised to ensure that they do not play with the device.
- Keep the packaging materials, such as **plastic film, away from children**. The **danger of suffocation** could arise in the case of misuse.
- **Never open the casing** of the TFT monitor (electric shock, short circuit and the danger of fire)!
- Do not introduce **any objects** into the **inside of the TFT monitor** through the slots and openings (electric shock, short circuit and the danger of fire)!
- The slits and opening of the TFT monitor serve ventilation. **Do not cover these openings** (overheating, danger of fire).
- Do not exert any pressure on the display unit. There will be the danger of the monitor breaking.
- **Attention!** There will be the danger of injury if the display unit has been broken. Pack up the broken parts with **protective gloves** and send them to your service centre for specialist **recycling**. Then wash your hands with soap, because it cannot be excluded that **chemicals** can escape.
- Do not touch the screen with objects with points or sharp edges, in order to avoid damage.
- Use a blunt entry stylus or a finger exclusively.

Contact **Customer Service** if:

- The mains cable has been contaminated or damaged
- Liquid has penetrated the monitor
- The TFT monitor is not functioning correctly
- The TFT monitor has been dropped or the casing is damaged

Caution! Pay attention to the set-up location!

- New devices can emit a typical, unavoidable but completely **harmless smell**, which reduces increasingly in the course of time, in the initial hours of operation. We recommend that you **ventilate** the room **regularly**, in order to counter the formation of the smell. We have taken care that the applicable limits are clearly fallen below during the development of this product.
- Keep your TFT monitor and all the connected devices away from **moisture** and avoid **dust, heat** and direct **solar radiation**. Failure to comply with this information can lead to faults or damage to the TFT monitor.
- Do **not** operate your **device in the open air**, because external influences, such as rain, snow, etc. could damage the device.
- Do not subject the device to drops of water or spray and do not put any **containers filled with liquid** (vases or similar) **on the device**. Liquids penetrating can impair the electrical safety of the device.
- Do not put **any open sources of fire** (candles or similar) **on the device**.
- Pay attention to **sufficiently large clearances** in the wall unit. Maintain a **minimum clearance of 10 cm around the device** for sufficient ventilation.
- Place and operate all components on a **stable, level** and **vibration-free base**, in order to avoid the TFT monitor falling.
- **Avoid fading effects, mirror effects** and too strong **contrasts between light and dark**, to save your eyes and to guarantee comfortable workstation ergonomics.
- Take **regular breaks** when working at your TFT monitor, to prevent tension and tiredness.

Repair

- Leave the repair of your TFT monitor exclusively to qualified specialist personnel.
- Please contact our authorised **Service Partners** exclusively in the case of a necessary repair.

Caution! Pay attention to the surrounding temperature!

- The TFT monitor can be operated at a surrounding temperature from 0° C to +35° C and at a relative ambient moisture level of < 80% (non-condensing).
- The TFT monitor can be stored at -20° C to +60° C when it has been turned off.



Danger! Pay attention to the following:

Wait to bring the device into operation until it has reached the surrounding temperature, after the TFT monitor has been transported.

Moisture, which can cause an **electrical short-circuit**, can form within the TFT monitor in the case of wide **variations in temperature or moisture**.

Warning! Pay attention to safety during the connection!

Power supply



Please pay attention: Parts of the device will be subject to voltage, even if the mains switch has been switched off. **Pull the mains plug from the socket**, to interrupt the power supply to your TFT monitor or to release the device from voltage completely.

- Only operate the TFT monitor at an earthed socket with **100-240V~, 50/60 Hz**. Ask your energy supplier if you are not sure about the power supply at the set-up location.
- We recommend the use of **protection against excess voltage** for additional safety, in order to protect your TFT monitor against damage because of **voltage peaks** or **electrical flashes** on the mains network.
- Pull the mains plug from the socket, in order to **interrupt** the **power supply** to your monitor.
- The **socket** must be located close to the TFT monitor and be **easily accessible**.
- Lay the cable so that no-one can tread on it or trip over it.
- Do not place **any objects on the cable**, because it could be damaged otherwise.
- Your device has an On/Off switch. The TFT monitor can be switched on and off by means of it. **No power** will be consumed if the switch is standing at **OFF (0)**. Put the On/Off switch to **OFF** or use a master/slave power strip, in order to avoid power consumption when the device is switched off.

Norms / Electromagnetic compatibility

The TFT monitor fulfils the requirements for electromagnetic compatibility and electrical safety of the following regulations:

EN 55022:2006	Information technology equipment, interference – Limiting values and measuring procedure
EN 55024:1998 + A1:2001 + A2:2003	Information technology equipment – Characteristics resisting interference - Limiting values and test procedure
EN 61000-3-2:2006	Electromagnetic compatibility (EMV); Part 3: Limiting values; Section 2: Limiting values for harmonic currents (device input current < 16A per conductor)
EN 61000-3-3:1995 + A1:2001 + A2:2005	Electromagnetic compatibility (EMV); Part 3: Limiting values; Section 3: Limiting values for variations in voltage and flickering in low voltage networks for devices with and input current < 16A per conductor
EN 60950-1:2001 + A11:2004	Safety of information technology equipment

- Maintain at least one metre clearance from **high frequency** and **magnetic sources of interference** (television device, loudspeakers, mobile phone, cell phone, etc.), in order to avoid disruptions to function and data loss.
- The failure of individual or several scanning spots can arise in rare cases, in spite of the most modern manufacture, because of the highly complex technology.

Your device complies with the European Norm ISO 13406-2 Class II (Pixel error class) (see P. 20).

Your device complies with the basic requirements and the relevant guidelines of the 2004/108/EU EMV Guidelines [electromagnetic compatibility] and the 2006/95/EU Guideline for low voltage devices.

This device fulfils the basis requirements and the relevant regulation of the Ecodesign Guideline 2009/125/EG (Order 1275/2008).

Bringing the device into operation



Information

Please read the “**Safety information**” chapter on page 4 **under all circumstances** before bringing the device into operation.

Setting Up

- Fold the base down from the back.
- You can fold the base down continuously, so that the screen can be set up at different grades of inclination.

Preparation of your PC

You may have to make some preparations if you have been operating a tubed monitor on your computer up to now. This will be necessary if your current monitor has been operated with settings that are not supported by your new TFT screen.

The screen will represent up to **1920 x 1080** scanning elements. This resolution corresponds to the physical resolution. TFT screens achieve complete image quality with the physical resolution. The display will not appear on the whole area of the screen, under certain circumstances, if you change to a representation with deviating settings.

Distortions can also appear in the representation, particularly in the case of lettering.

Set a resolution and image frequency on the PC supported by both monitors, using the old monitor, before you connect the new monitor.

Shut down the PC and connect the new monitor.

You will be able to adjust the screen settings on the MD 20165 as described after restarting.

Supported monitor settings

This TFT monitor supports the following modes.

Resolution	Horizontal Frequency	Vertical Frequency
720 x 400	31.47 kHz	70 Hz
640 x 480	31.47 kHz	60 Hz
640 x 480	31.47 kHz	67 Hz
640 x 480	37.8 kHz	72 Hz
640 x 480	37.5 kHz	75 Hz
800 x 600	37.7 kHz	56 Hz
800 x 600	37.8 kHz	60 Hz
800 x 600	48.0 kHz	72 Hz
800 x 600	46.87 kHz	75 Hz
832 x 624	48.67 kHz	75 Hz
1024 x 768	48.36 kHz	60 Hz
1024 x 768	56.48 kHz	70 Hz
1024 x 768	60.0 kHz	75 Hz
1152 x 864	67.0 kHz	75 Hz
1152 x 870	45.0 kHz	75 Hz
1280 x 768	47.0 kHz	60 Hz
1280 x 960	60.0 kHz	60 Hz
1280 x 1024	63.98 kHz	60 Hz
1280 x 1024	80.0 kHz	75 Hz
1440 x 900	56.0 kHz	60 Hz
1440 x 900	71.0 kHz	75 Hz
1600x 1200	75.0 kHz	60 Hz
1680 x 1050	65.0 kHz	60 Hz
1920 x 1080*	67.0 kHz	60 Hz

*Recommended resolution (physical)

Supports settings in the DVI and HDMI video mode

480i/480p

576i/576p

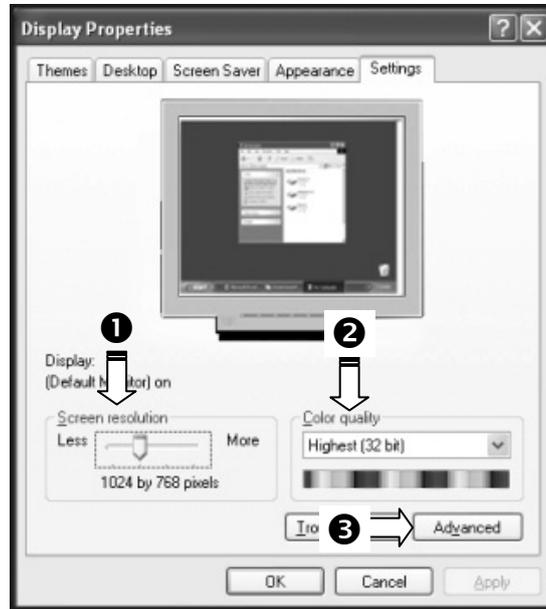
720p

1080i/1080p

Monitor settings under Windows XP*

You will make the screen setting in 'Display Properties' in the Windows program under Windows XP. The program can be started as follows:

- Right mouse-click on the Windows interface (Desktop) and left mouse-click on „Characteristics“.
- or
- Double-click on the “Display” icon in “System Control”.



(Ill.: Display properties)

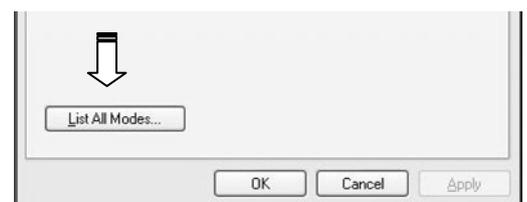
Set the resolution under “Screen resolution” (❶).

You can set the depth of colour (number of the colours represented) under “Colour quality” (❷). Your TFT monitor will support a depth of colour of a maximum of 16 million colours, which corresponds to 32 bits or ‘Real Color’.

The image refresh frequency can be set under “Expanded” (❸).

A Window with the characteristics of your graphics card will appear, according to the configuration of your computer.

You will be able to set the required value in the “List all modes” field under “Graphics card”. The optimal value lies at 60 HZ in the case of a TFT monitor. 75 Hz can be set as a maximum.



(Ill.: Detail of Display Characteristics)



Important!

You will possibly not receive any images if your setting does not correspond to the values supported by your display unit. In this case, reconnect your CRT monitor and set the applicable values in correspondence with the options specified above under “Display properties”.

* The Touch Function is not available under Windows® XP.

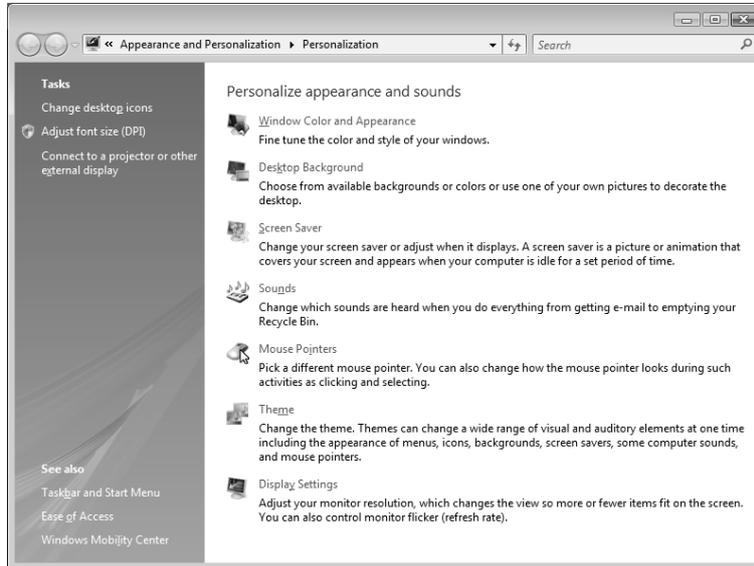
Monitor settings under Windows Vista®*

You will make the screen settings in 'Personalize appearance and sounds' Windows program under Windows Vista®. The program can be started as follows:

- Right mouse click on the Windows interface (Desktop) and left mouse click on 'Personalize'.

or

- Through Start ⇒ Control Panel ⇒ Personalize appearance and sounds by a double click with the left mouse button.



(III.: Personalize appearance and sounds)

- Open the Display Settings Menu, to adjust the resolution and the frequency.

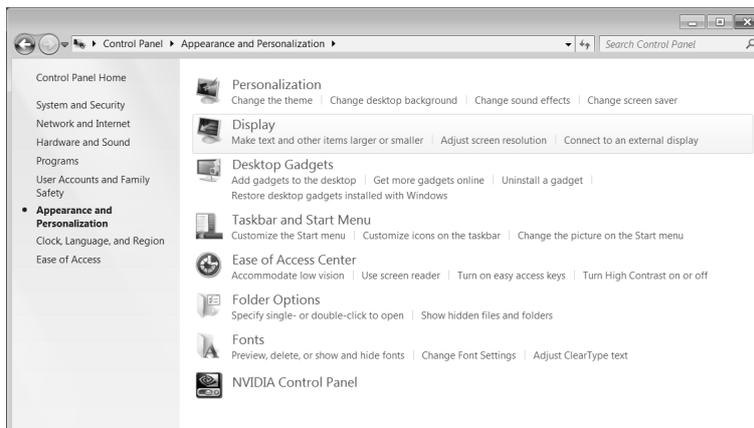
Monitor settings under Windows® 7

Make the screen settings in the 'Appearance and Personalization' Windows program under Windows® 7. The program can be started as follows:

- Right mouse click on the Windows interface (Desktop) and left mouse click on 'Personalize'

or

- Through Start ⇒ Control Panel ⇒ Appearance and Personalization by a double click with the left mouse button.

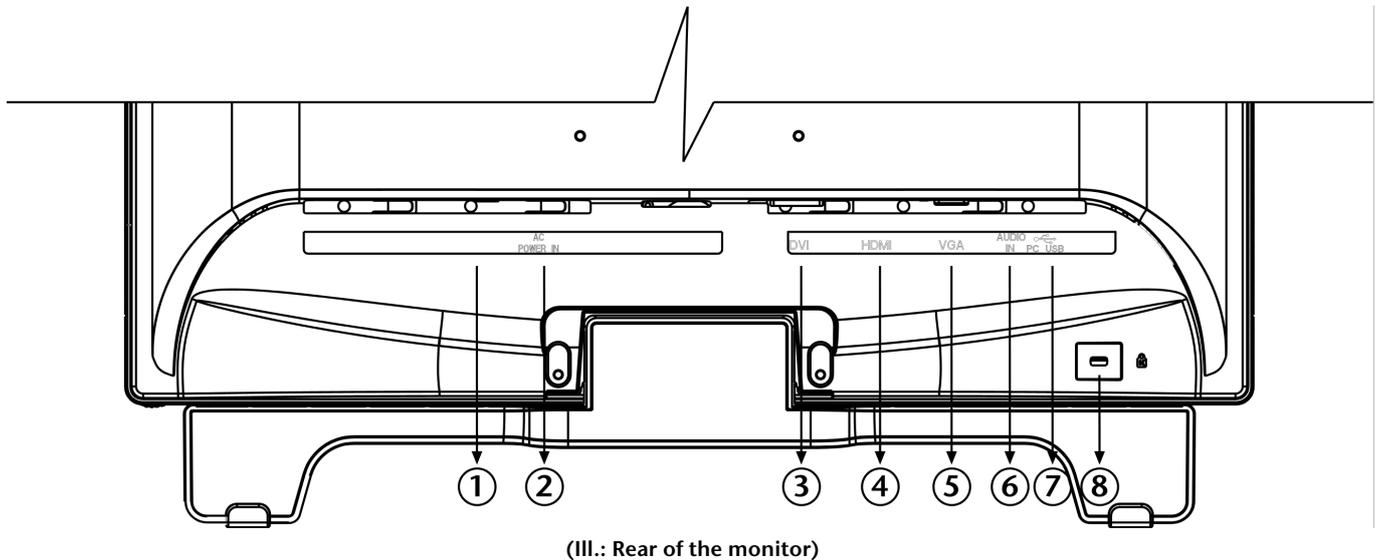


(III.: Appearance and Personalization)

- Select the Display ⇒ Adjust screen resolution Menu, to adjust the resolution and the frequency.

* The Touch Function is only available as a single touch (only with one finger) under Windows Vista®.

Connections on the back



1. Power Switch
2. Power supply (POWER IN)
3. DVI-D 24-Pin connection (DVI)
4. HDMI connection (HDMI)
5. Mini 15-pin D-sub connection (VGA)
6. 3.5 mm stereo jack audio connection (AUDIO IN)
7. USB connection for the Touch Function* (PC USB)
8. Intake device for protection against theft (Kensington lock)

Connecting the monitor

- Ensure that the TFT monitor has not yet been connected to the electricity supply (mains plug not yet plugged in) and that neither the TFT monitor nor the computer has been switched on.
- Prepare your computer for the TFT monitor if necessary, so that the correct settings for it will be present.

1 Connect signal cable

- Plug the signal cable into the appropriate VGA, HDMI or DVI connections on the computer and the TFT monitor.

2 Connect audio cable

- Plug the audio cable into the appropriate audio sockets on the computer and the TFT monitor.

3 Connecting the USB cable for the Touch Function*

- Plug the USB cable into the USB connections on the computer and the TFT screen.

4 Connect the power supply

- Now connect one end of the mains cable supplied with the device to TFT power supply connection and then the other end to an appropriate socket. The mains socket must be in the vicinity of the TFT monitor and be easily accessible (use the same electricity circuit as for the PC).

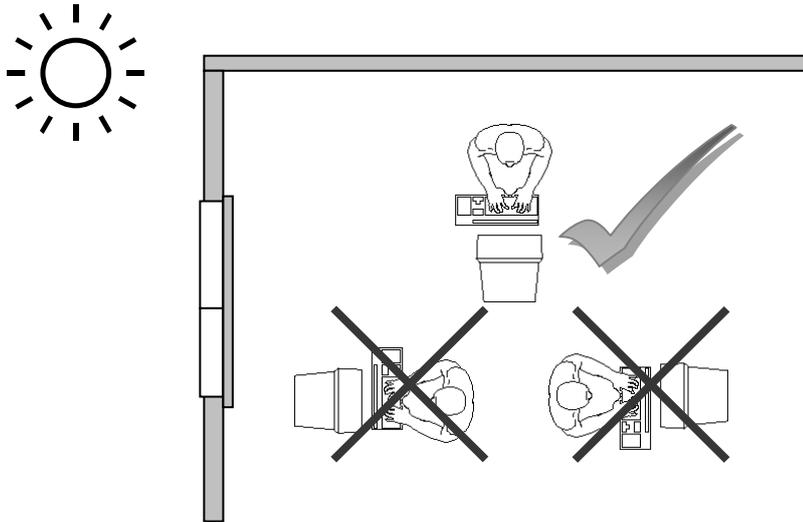
5 Switch on the power supply

- Your TFT monitor has a mains switch on the back, by means of which you will be able to switch it on and off. No power will be consumed if the switch is positioned at **0**. First, put the mains switch at **I** and then switch your monitor on at the On/Off switch on the front of the device. Finally, switch your computer on.

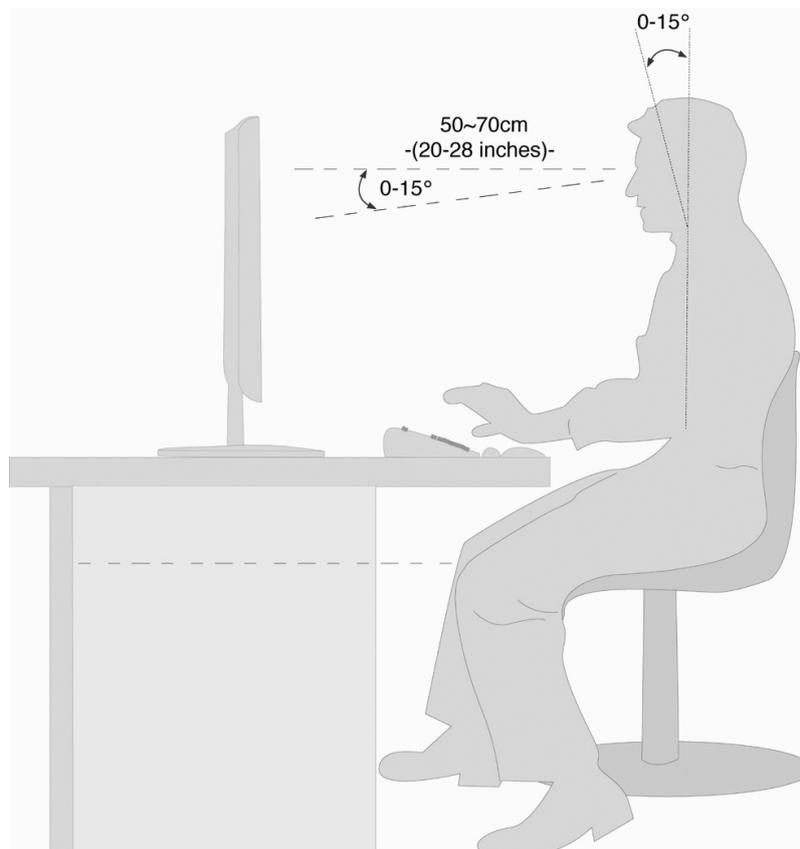
* Can only be used in connection with Windows® 7

The video workstation

Please pay attention to the following: The monitor device should be set up so that mirror effects, fading and strong contrasts between light and dark are avoided (even if the view from the window is still so attractive!)



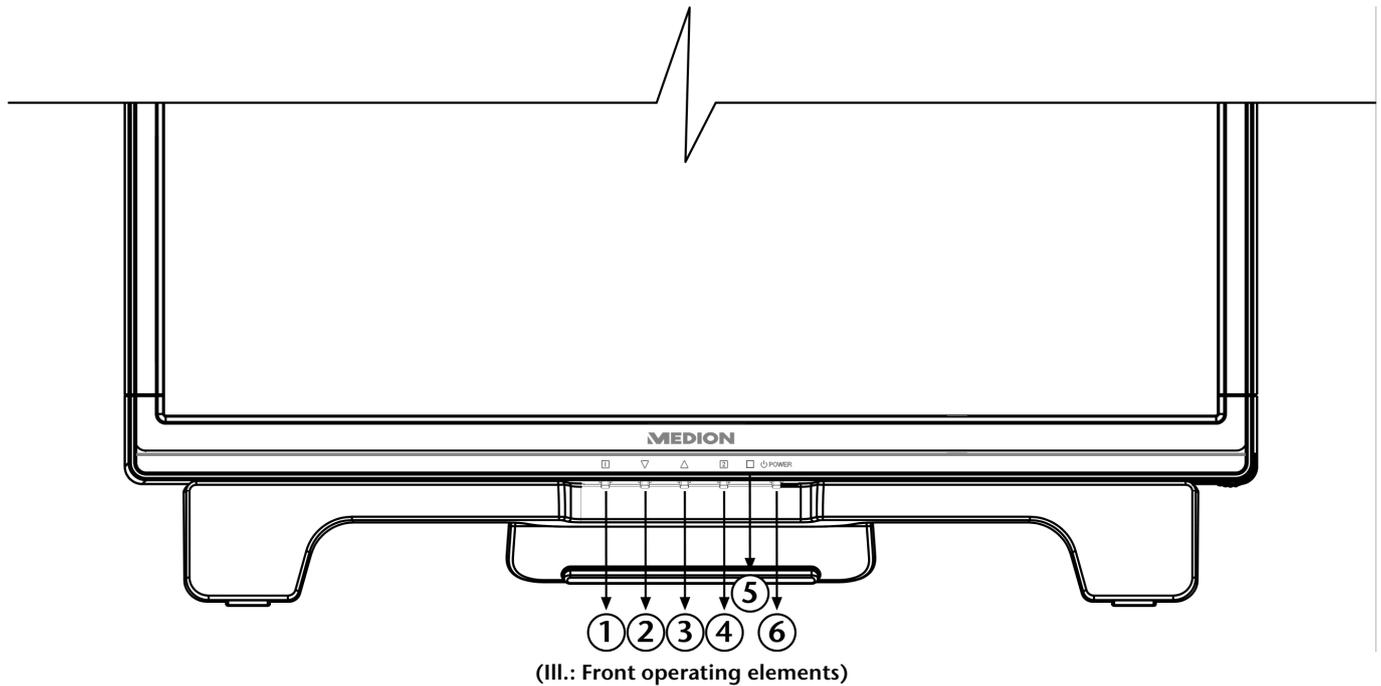
(III.: Setting up of the monitor)



(III.: Video workstation)

- Surface supporting the hands: 5 - 10 cm
- Highest monitor line at eye level or somewhat below it
- Viewing distance: 40 to 70 cm
- Leg-room (vertical): At least 65 cm
- Leg-room (horizontal): At least 60 cm

Operating elements



Ref.	Button	Description
❶		<p>You will start the OSD (On Screen Display) with this button. Press this button again if you wish to leave the OSD.</p> <p> + Power block, when the OSD is not activated</p> <p> + OSD block, when the OSD is not activated</p> <p>Hold the key combination until the bar displayed has moved from left to right completely, to activate/de-activate the block. A corresponding message will appear on the screen.</p>
❷		<p>Select a parameter and reduce its value with this button, when the OSD is switched on.</p> <p>If you are not in the OSD: Direct call-up of the Contrast/Brightness menu.</p>
❸		<p>Select a parameter and increase its value with this button, when the OSD is switched on.</p> <p>If you are not in the OSD: Direct call-up of the OptiColor Mode menu.</p>
❹		<p>Confirm the selection of the parameter to be changed with this button.</p> <p>If you are not in OSD: Select the VGA, DVI or HDMI signal input</p> <p> + DDC*/CI ON/Off (ON:DDC/CI ; Off:DDC/2B), in the case of non-activated OSD</p>
❺	Operational display	Shows the operational state.
❻		You can switch the TFT monitor on or to the Standby mode with this button.

*DDC = Display Data Channel: The communications interface between the screen and the PC. This permits the operating system to install and configure the monitor driver automatically.

Commands for the Touch Function

You will no longer have to tap or click on a Menu command or a strip of symbols to carry out frequently used tasks such as copying, entering, reversing changes or deleting. You will be able to carry out the task with a movement instead. For example, you will be able to move a displayed page up or down with a respective movement of your finger up or down.

Your screen will recognize two finger input pointers. You will be able to use the Windows finger entries for this reason.

The different Windows finger movements are described in the following Table.

Movement	Execution	Description
Moving	Touch the respective page with one or two fingers and move it by dragging it.	Use the move to display a different section of a page that has scroll bars. For example, you will be able to carry out a move to display the part of a long document or a calculation table that can not be seen in the Window. The page will be moved if you carry out the move with one finger and move the finger vertically at the same time. In contrast, text will be marked on the respective page if you drag your finger horizontally.
Zoom	Touch two points on the respective subject and then move your fingers towards each other, as if you were pressing them together, to reduce it in size. Touch two points on the respective subject and then move your fingers away from each other, as if you were pulling them apart, to enlarge it.	Use the zoom to enlarge or reduce a subject on the screen in size. A smaller section will be displayed in detail during the enlargement of an image. A larger section will be displayed during the reduction of an image in size.
Rotating	Touch two points on the respective subject and then move the subject in the required direction of rotation.	Use the direction of rotation to move an image or a subject on the screen circularly (clockwise or anti-clockwise).
Pressing and tapping	Press on the subject with one finger and keep the finger pressed down, then tap quickly with another finger.	Use the pressing and tapping movement to access the Context Menu. The same action as with holding pressed down or right clicking on a subject will be carried out with pressing and tapping.

Changing the parameters of the TFT monitor

The **On Screen Display** (abbreviation: OSD) is a menu that is briefly faded in across the TFT monitor. You will be able to set certain parameters of the TFT monitor through the OSD menu.

Operating the OSD menu

1. Press the **1** button, in order to activate the OSD.
2. Select the options from the Main Menu with the **▽/△** function selection buttons.
3. Confirm your selection with the **2** button.
4. Press the **1** button, in order to leave the OSD.

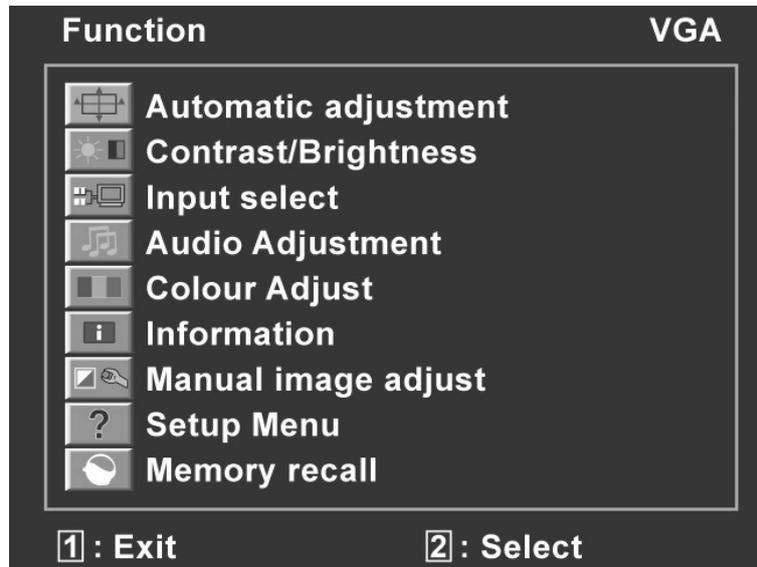


Important!

The OSD will be faded out automatically if you have not operated any button on the TFT monitor for the pre-set time.

The OSD menu

The main functions or possible settings through the OSD are explained in the following.



(III.: OSD menu)



Important!

The menus described here can differ from those on your monitor because of possible technical changes.

Menu point	Function / sub-menu
	Automatic adjustment: Sets the horizontal and vertical position, phase (fine tune) and clock cycle (H size) automatically.
	<p>Contrast: Sets the white value of the monitor foreground.</p> <p>Brightness: To adjust the brightness of the video.</p> <p>DCR: You can switch the DCR function (dynamic contrast) on and off here.</p> <p>ECO: Switch ECO on and off. Contrast and brightness adjustments are de-activated in the ECO Mode.</p>
	<p>Important!</p> <p>The Standard setting must have been selected in the OptiColor Mode to be able to make Contrast and Brightness settings.</p>
	Input Select: The signal input will be switched
	<p>Audio Adjustment: For setting the audio function.</p>
	<p>Volume: Sets the sound output of the loudspeakers.</p> <p>Mute switch: Enables the selection between Mute On/Off.</p>
	<p>Colour Adjust (Color Adjust): For the selection of the colours, in order to improve the brightness and the colour saturation. Selection can be made between: Cool, Normal, Warm and user-defined colours.</p>
	<p>Cool: Adds blue to the monitor, creating a cooler white.</p> <p>Normal: Adds red to the monitor, creating a warmer white and a brighter red.</p> <p>Warm: Adds green to the monitor, creating a darker colour tone.</p> <p>User colour: Individual settings for red(R), green(G) and blue(B).</p>
	Information: Displays information about the current input signal of the graphics card of your computer.
	Manual Image Adjust: Horizontal size. H./v. position, fine tune, sharpness, video mode adjust and optical colour mode.
	Horizontal size: Sets the width of the monitor.
	H./V. Position: Sets the horizontal and vertical position of the video image.
	Fine Tune: Fine tune to improve the display of the TFT monitor.
	Sharpness: For the adjustment of the clarity in the case of a signal that does not correspond to the physical resolution of the screen.
	Video Mode Adjust: An image size from options Full Screen and Over Screen .
	<p>OptiColor Mode: This mode offers an optimum display environment according to the content displayed.</p>
	<p>User is suitable for all the general Windows environments and standard monitor settings.</p> <p>Game is optimum for PC or TV games.</p> <p>Video is optimum for replaying feature films and moving images.</p> <p>Landscape is optimum for displaying pictures of landscapes.</p> <p>Text is optimum for processing texts and text displays in a text processing environment.</p>
	Setup Menu: Set the language, OSD position and OSD time out.
	Language: Enables the user to select between the available languages.
	OSD Position: Horizontal and vertical setting of the OSD position.
	<p>H. Position: For the horizontal setting of the OSD position.</p> <p>V. Position: For the vertical setting of the OSD position.</p>

		OSD time out: For switching off the On Screen Display (OSD) automatically after the expiry of a preset period of time.
		OSD background: Enables the OSD background to be switched on and off.
	Memory Recall): To recreate the factory settings for controlling video and audio.	

Energy-saving properties

This monitor will switch to various energy-saving statuses set in advance by the respective computer / operating system. This complies with the current requirements to reduce energy consumption.

The monitor supports the following types of energy-saving mode:

Status	Power (nominal value)	Colour of the LED	Readiness (approx.)
ON	< 45 Watts	Blue	-
STAND-BY	< 1 Watt	Orange	2 seconds

The monitor will remain in the energy-saving status until you press a key on the keyboard or move the mouse, depending on the operating system.

The monitor will need about 2 seconds to switch from the **STAND-BY** status to the **ON** operating mode.

Customer Service

Solving problems

Make sure that the TFT monitor has been installed correctly (read the “**Bringing into operation**” chapter from Page 6), if problems with your TFT monitor arise. Read the information in this chapter about possible solutions if the problems continue to exist.

Localisation of the cause

Problems with functionality sometimes have commonplace causes but can also arise from defective components. We cannot provide every solution possible in this manual but would be more than happy to help you by telephone. Please call us if you need support.

Check the connections and cables

Start with a careful visual check of all cable connections. Ensure that the TFT monitor and the computer are correctly supplied with electricity, if the indicator lights are not functioning.

Faults and possible causes

The monitor does not display any image:

Check:

- **Mains supply:** The power supply cord must be sitting firmly in the socket and the mains switch must be switched on.
- **Signal input:** Please check whether the signal input (computer or other device) is switched on and the connection cables are sitting firmly in the sockets.
- **Image refresh frequencies:** The current image refresh frequency must be suitable for the TFT monitor.
- **Energy-saving mode:** Press any button or move the mouse to deactivate the mode.
- **Screen saver:** Press a button on the keyboard or move the mouse if the screen saver of the computer is activated.
- **Signal plugs:** Please contact your respective customer service if pins are bent.
- Set the applicable values for your TFT monitor (see “**Preparations on your PC**”, Page 7).

The image slips or is erratic:

Check:

- **Signal plugs:** Please contact your respective customer service if pins are bent.
- **Signal plugs:** The plugs of the signal cable must be sitting firmly in the sockets.
- **Graphics card:** Check whether the settings are correct (see Page 8).
- **Image refresh frequencies:** Select the permissible values in your graphics settings.
- **Monitor output signal.** The monitor output signal of the computer must agree with the technical data of the monitor.
- Remove disruptive devices (mobile telephones, cell phones, loudspeakers, etc.) from the vicinity of your TFT monitor.
- Avoid the use of monitor extension cables.

Symbols are displayed darkly, the image is too small or not centered, etc.:

- Readjust the respective settings (Setting the TFT monitor, Page 14)

Colours are not displayed cleanly:

- Check the signal cable pins. Contact your respective customer service if pins are bent.
- Readjust the colour settings in the OSD menu.
- Avoid the use of monitor extension cables.

The display is too light or too dark:

- Check whether the video output level of the computer agrees with the technical data of the monitor.
- Select automatic control, to optimise the settings for brightness and contrast. The display unit should show a text page (e.g. Explorer, Word, etc.) for its optimisation.

The image flutters:

- Check whether the operational voltage agrees with the technical data of the monitor.
- Select automatic control, to optimise the settings for the synchronisation of pixels and phases. The display unit should show a text page (e.g. Explorer, Word, etc.) for its optimisation.

Driver information

No driver installation is necessary for the functioning of your monitor.

You will be able to download the driver program file from the internet website listed below if the operating system nevertheless requests the installation of a monitor driver.

The installation of a driver can differ according to the operating system. Follow the specific instructions for your operating system.

www.medion.com

Do you need further support?

Please contact us if the suggestions in the above sections have not solved your problem. It would help us very much if you make the following information available to us:

- What is your computer's configuration?
- What peripheral devices are you using?
- What messages appear on the monitor?
- What software were you using when the fault arose?
- What steps have you already taken to solve the problem?
- Give us your customer number if you have already received one.

Cleaning

You will be able to extend the useful life of the TFT monitor by the following measures:



Important!

No **parts to be maintained** or cleaned are located within the monitor casing.

- Always pull out the mains plug and all connecting cables before cleaning.
- Do not use any solvents, corrosive or gaseous cleaning substances.
- Clean the screen with a soft, fluff-free cloth.
- Pay attention that **no drops of water** remain on the TFT monitor. Water can cause long-lasting discolouring.
- Do not subject the screen to either dazzling sunlight or to ultra-violet radiation.
- Only use suitable cleaning substances, such as glass cleaner or screen cleaner (available in specialist shops), to clean the screen.
- Please keep the packaging material and use this exclusively to transport the TFT monitor.

Disposal



Packaging

Your device is in packaging for protection against transport damage. Packaging is made from materials that can be disposed off in an environmentally friendly way and taken to correct recycling.



Device

Do not throw the device into the normal domestic refuse after the end of its useful life under any circumstances. Obtain information about the possibilities of environmentally friendly and correct disposal.

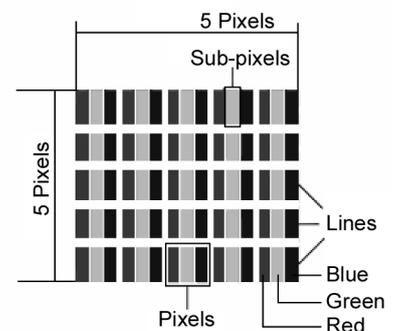


Pixel errors in the TFT monitor

A total of **approx. 6.2 m** control transistors are used in the case of Active Matrix TFTs with a resolution of **1920 x 1080 pixels**, each composed of three sub-pixels (red, green, blue). A failure or incorrect control of pixels or individual sub-pixels can arise occasionally, because of this very high number of transistors and the extremely complex manufacturing process associated with it.

There have been continuous approaches to define the number of permitted pixel errors in the past. However, these attempts have for the most part been very complicated and completely different from manufacturer to manufacturer. MEDION follows the strict and transparent requirement of the **ISO 13406-2, Class II Norm**, which are summarised in brief in the following, in the handling of guarantees for all TFT display products for this reason.

Among other matters, the 13406-2 ISO Standard defines generally applicable guidelines in relation to pixel errors. The pixel errors are categorised into four error classes and three types of error. Each individual pixel is composed in its turn of three sub-pixels each with a basic colour (red, green, blue).



Types of pixel error:

- Type 1:
Pixels shining for a long time (bright, white point), although **not** activated.
A white pixel arises because of the illumination of all three sub-pixels.
- Type 2:
Pixels not shining (dark, black point), although activated
- Type 3:
Abnormal or defective sub-pixels coloured red, green or blue (e.g. shining for a long time with half brightness, not lighting one colour, flashing or flickering, but not Type 1 or 2)

Addition: Cluster of Type 3 (= failure of two or more sub-pixels in a block of 5 x 5 pixels. A cluster is a field of 5 x 5 pixels (15 x 5 sub-pixels).

Classes of pixel error:

Error Class	Type 1	Type 2	Type 3	Cluster of Type 3
I	0	0	0	- 0
II	2	2	5	- 2
III	5	15	50	5
IV	50	150	500	50

The permitted number of errors of the types specified above in each class of error relates to a million pixels and must be converted in accordance with the physical resolution of the display.

A maximum **permitted** number in **Error Class II** follows from this:

For a resolution of	M. pixel	Sub-pixels	(Type, see above)
1024 x 768 (15")	0.786432	2.359296	2 2 4 - 2
1280 x 1024 (17,18, 19")	1.310720	3.932160	3 3 7 - 3
1600 x 1200 (19")	1.920000	5.760000	4 4 10 - 4
1440 x 900 (19" wide)	1.296000	3.888000	3 3 7 - 3
1600 x 900 (20" wide)	1.440000	4.320000	3 3 7 - 3
1680 x 1050 (20" wide, 22" wide)	1.764000	5.292000	4 4 10 - 4
1920 x 1080 (23" wide)	2.073600	6.220800	4 4 10 - 4
1920 x 1200 (25" wide)	2.304000	6.912000	4 4 10 - 4

Error Class I is only used in the case of special applications, e.g. in the medical sector, and is associated with corresponding supplementary costs. Error Class II has become established as the standard for manufacturers conscious of quality and with very good display units.

Example:

A 22" display unit consists of 1920 horizontal and 1080 vertical scanning elements (pixels), that is 2,073,600 pixels in total. This gives a factor of about 2.07 in relation to one million pixels.

Error Class II therefore allows 4 errors of both Type 1 and Type 2, 10 Type 3 errors and 4 Type 3 clusters.

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Technical data

• Model	MD 20165
• Monitor size	21,5" (approx. 55 cm), TFT
• Size ratio	16:9
• Nominal voltage	AC 100-240 V ~ 50/60 Hz
• Nominal electricity	1.8 A
• Resolution	1920 x 1080
• Brightness	300 cd/m ² (typical)
• Contrast	1,000:1 (typical)
• Dynamic contrast	60,000:1
• Reaction time	2 ms (grey to grey, typical)
• Viewing angle h/v	170°/160° (typical) CR>10
• RGB input, analog	15-terminal D-SUB connection
• RGB input, digital	DVI-D with HDCP decoding
• HDMI Eingang	HDMI with HDCP decoding
• Audio Input	1 Vrms max. 100Hz~8KHz 3.5 mm stereo jack
• Audio Output	2 x 1.5 W max.
• User control	Power ON/OFF, OSD
• Temperatures	In operation 0 C ~ +35°C Not in operation -20° C ~ +60°C
• Moisture (Non-condensing)	In operation < 80% Not in operation < 90%
• Weight (net/gross)	5.4 kg / 7.0 kg
• Dimensions (WxHxD)	516 x 383 x 120 mm
• Power consumption (Stand-by)	Less than 1 Watt
• Power consumption (operation)	Less than 45 Watt

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