

miroCRYSTAL VR 2000 miroCRYSTAL VR 4000

USER'S GUIDE

miroCRYSTAL VR 2000 / miroCRYSTAL VR 4000

User's Guide

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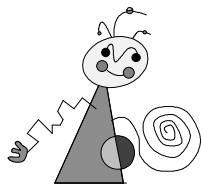
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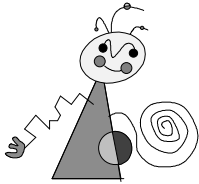
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FCC Compliance Statement

FOR YOUR OWN SAFETY

NOTE: Shielded cables should be used for a composite interface. This is to ensure continued protection against radio frequency interference.

FCC WARNING STATEMENT

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ♦ Reorient or relocate the receiving antenna.
- ♦ Increase the separation between the equipment and receiver.
- ♦ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ♦ Consult the dealer or an experienced radio/TV technician for help.

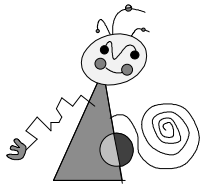
CAUTION

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

Shielded interface cable must be used in order to comply with the emission limits.

LABEL WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



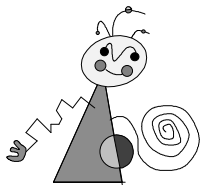
For your own safety

In the interest of your own safety and the flawless functioning of your new product and computer system please note the following:

- ♦ Before opening the computer make sure that the power plug is disconnected from the main socket.
- ♦ Computer components are sensitive to static charge. Divert any electrostatic charge from your person before touching the components with your hands or any tools.
- ♦ Make sure that the components you want to add to the computer are in compliance with the computer's characteristics.



For changes that have occurred after the manual has been printed, refer to the README file on the CD-ROM supplied with your system!



About the manual

This manual explains how to install and use the miroCRYSTAL VR 2000/ miroCRYSTAL VR 4000 hardware and software.

Subheadings

In the margins are subheadings to help you quickly find your way through this manual.



Important text passages are marked with the “notepad” and this format.

Numbers mark step by step instructions:

1. Start Windows.

Bullets mark instructions for optional steps the order of which is not important.

- Connect the miro board to the monitor.

All keyboard commands appear in this font:

install<↵>

<↵> represents the enter key.

Menus, commands, options or buttons which the user can select are written in *italics*.



FEATURES

With **miroCRYSTAL VR 2000 / miroCRYSTAL VR 4000**, miro offers 64-bit Windows graphics accelerators with an especially fast 3D accelerator. These boards enable users to play DOS- and Windows-based 3D games with impressive, high-resolution 3D graphics. However, the board also packs enough performance for use in animation studios or in the fields of presentations and advertising. **miroCRYSTAL VR 2000 / miroCRYSTAL VR 4000** offers software-supported MPEG playback.

☐ **3D acceleration**

At present, only the S3 ViRGE-Chip, which was developed especially with Windows applications in mind, fulfills the high demands placed on graphics processors by the representation of three-dimension objects including corresponding textures.

☐ **Multimedia acceleration**

For digital video applications a video processor is integrated in the graphics processor. This processor offers a digital overlay and an optimal playback: it scales video to any size up to 1024 x 768 pixels – without jerky playbacks and frame losses. When enlarging video the pixels are not just multiplied but the additional pixels are calculated, this technique achieves a very good image quality even at high resolutions.

☐ **MPEG playback**

The MPEG playback software is able to decompress and zoom video files very quickly, enabling full-screen, flicker-free, and non-jerky playback of MPEG videos. The decoder supports all video CD formats and *.MPG files.

☐ **DirectDraw/Direct3D**

The new Windows 95 DirectDraw and Direct3D interfaces permit acceleration of 3D games and also open up brand new possibilities for professional 3D rendering.

☐ **Video memory**

miroCRYSTAL VR 2000 is equipped with 2 Mbytes of VRAM, **miroCRYSTAL VR 4000** is equipped with 4 Mbytes of VRAM with 60 ns, thus achieving especially high screen refresh rates.

☐ **Drivers**

miroCRYSTAL VR 2000 / miroCRYSTAL VR 4000 includes all of the necessary drivers to achieve the maximum performance from your system. In addition, the miro tools (for Windows 95 only) are provided.

☐ **Memory upgrade for miroCRYSTAL VR 2000**

You can upgrade your **miroCRYSTAL VR 2000** board with 2 Mbytes of memory using the 2 Mbyte upgrade kit.

☐ **Video Sources and Video Formats**

The integrated video output allows to connect a TV set and/or a VCR supporting composite or S-Video signals (e. g. VHS, S-VHS).

☐ **Flicker Reduction**

This new patented technology has been developed by miro to reduce flickering when the image is output to TV or recorded using the VCR.

☐ **miroVGA2TV**

miroVGA2TV allows you to connect a TV set to your computer and use it under DOS, recording DOS applications to video and playing DOS games on the TV set.

SYSTEM REQUIREMENTS

To install miroCRYSTAL 2000 / 4000, your computer system has to meet the following requirements:

Computer	A 486 or Pentium computer or compatible with a PCI Local Bus slot.
Monitor	Standard VGA monitor. To receive all the benefits from the graphics board, you need a high-resolution multifrequency monitor. miro offers suitable monitors. To enable the data transfer between the monitor and the graphics board, you need a DDC-capable monitor cable.
Software	Windows 3.1x, Windows 95, Windows NT or OS/2 Warp.
CD-ROM Drive	You will need a double-speed CD-ROM drive that supports X/A-MODE2.
TV set, VCR	If you wish to use the TV output, you need a TV set and/or VCR supporting a composite video or an S-Video signal.

PACKAGE CONTENTS

Before beginning the miroCRYSTAL 2000 / 4000 installation, please check to make sure your miroCRYSTAL 2000 / 4000 package is complete*:

- ♦ Graphics board**,
- ♦ CD-ROM,
- ♦ Documentation on CD,
- ♦ Quick installation guide,
- ♦ *optional (for miroCRYSTAL VR 2000):*
2 Mbyte upgrade kit

You will find the complete software and documentation on CD-ROM. Diskettes are not included in the package contents. To create installation diskettes, use the miroSETUP-Manager included on the CD-ROM. Diskettes can also be obtained from the miro Support-Mailbox.

* Depending on the delivery scope, the actual package contents may be different from the package contents listed in the manual.

** For model and serial number of your miro graphics board, refer to the label on the graphics board.



Graphics boards are sensitive to static charge. To avoid damage that may occur by static charge, leave the graphics board in its antistatic packaging until installation. Keep the packaging for possible future transportation.

CONNECTORS

miroCRYSTAL VR 2000 / 4000 has one composite video output and one S-Video output. You can connect the video devices in the following ways:

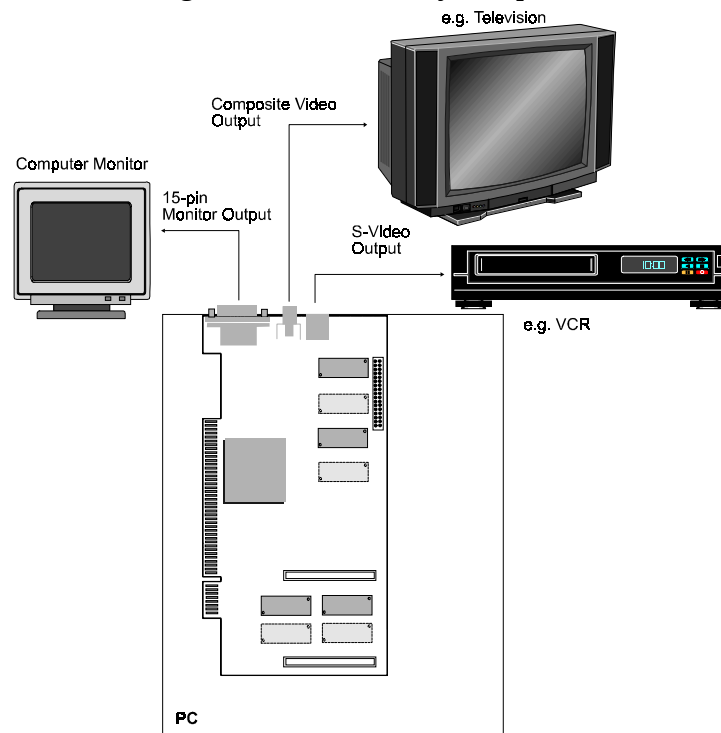
Video outputs

You can connect a TV set either to the **composite video** output or to the **S-Video** output. The supplied software enables you to switch between the output on the computer monitor and the output on the TV set. You can connect any video device to the video output which supports an S-Video signal or a composite signal in PAL or NTSC independently of the video system (e. g. VHS, S-VHS).

When choosing the video output, we recommend to use the S-Video output. This provides a much better image quality.

To connect a video device to the miroCRYSTAL VR 2000 / 4000 board, you need suitable cables (RCA or S-Video).

The following illustration shows you a possible hardware configuration:





Hardware installation

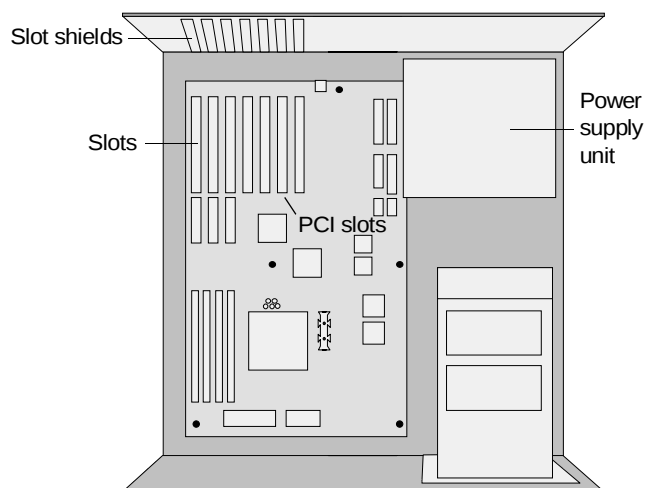
INSTALLING miroCRYSTAL 2000 / 4000

VGA The board's graphics chip has an integrated VGA component that cannot be turned off. Before the installation, however, any existing VGA board or motherboard VGA has to be removed from the computer or disabled.

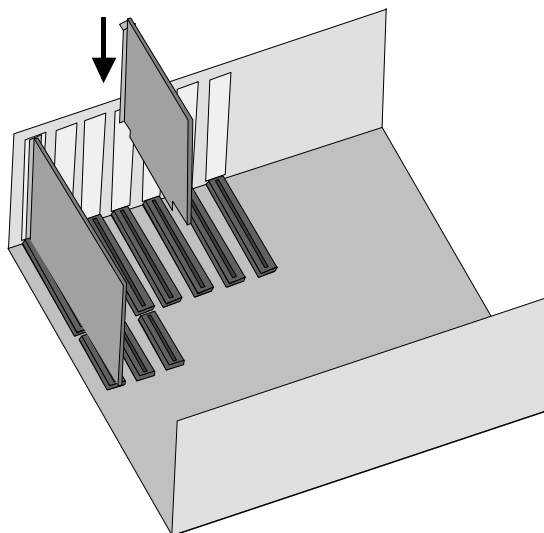
The only tool you need for the installation is a screwdriver.

Proceed as follows:

1. Turn off your computer and all peripheral devices. Disconnect the computer from the power supply and all necessary components.
2. Loosen the screws of the computer's cover and remove it.
3. Discharge yourself of static charge by touching the power unit casing.



4. If necessary, remove the VGA board from the computer or disable the motherboard VGA.
5. Select a free PCI slot. Remove the slot's cover at the back of the computer. Save the screws of the cover.
6. Carefully insert the graphics board into a PCI slot by holding the board at the top and gently pushing both ends into the slot at the same time. Press onto the upper edge of the board to make sure it is firmly seated in the slot.

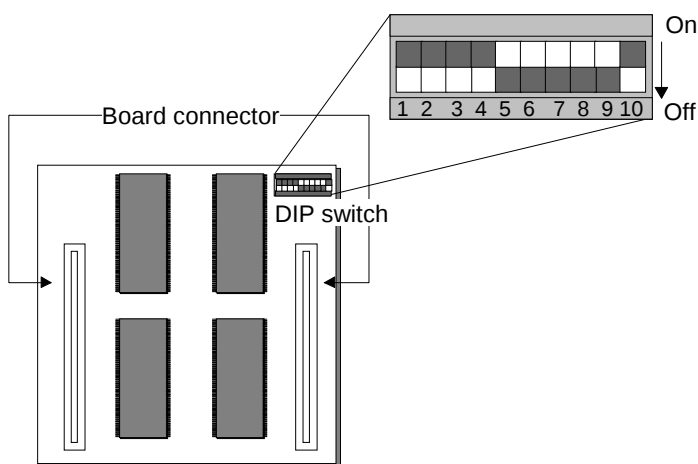


7. Don't force the board into the slot! You run the risk of bending the contacts. If the board does not fit easily, pull it back out, and try again.
8. Fasten the board's bracket at the back of the computer using the screws you saved from the shield.
9. Put the cover back on the computer and reconnect the peripheral devices.

INSTALLING miroCRYSTAL VR Upgrade

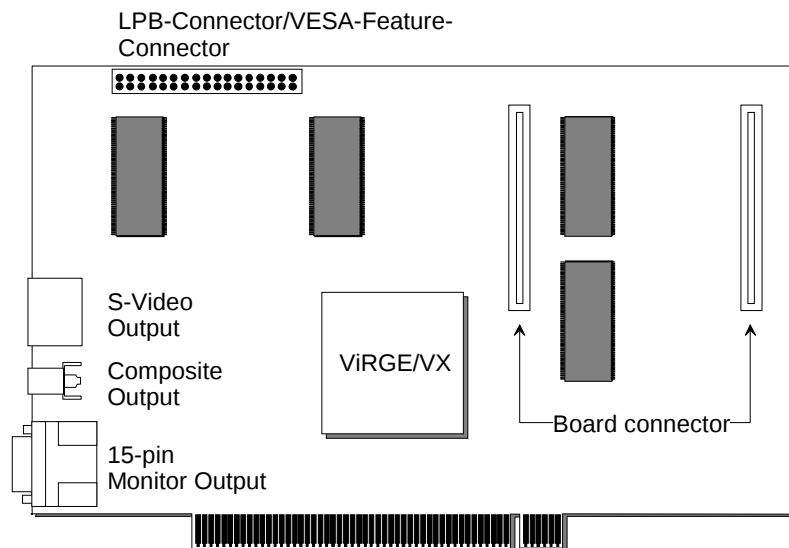
To upgrade your miroCRYSTAL 2000 board, you will first have to remove it from your computer if it is already installed.

1. Remove the miroCRYSTAL 2000 VR Upgrade from the packaging.
2. Please check the DIP switch setting on the miroCRYSTAL VR Upgrade board.



Switches „1“, „2“, „3“, „4“, and „10“ must be set to „Off“. This is also the default setting for the miroCRYSTAL VR Upgrade.

3. If necessary, change the DIP switch setting. To do so, please use a ballpoint pen with a pointed tip.
4. Locate the board connector on your miroCRYSTAL VR 2000 board (see below) onto which the Upgrade is plugged. Locate the corresponding board connector on the miroCRYSTAL VR Upgrade.



miroCRYSTAL VR 2000: Board Layout

5. Orient the miroCRYSTAL VR Upgrade so that it is above the corresponding connectors on the miroCRYSTAL VR 2000.
6. When the board connectors are positioned exactly above each other, press the plug-on module, gingerly at first, just one or two millimeters onto the miroCRYSTAL VR 2000 board.
7. If you feel no resistance and the Upgrade can be plugged on without any problems, then press it all the way onto the basic board. Otherwise, please do not attempt to force the Upgrade onto the basic board. Instead, remove the card and try again.
8. Insert the miroCRYSTAL VR 2000 in the computer. Proceed as described in the section “Installing miroCRYSTAL VR 2000 / 4000”.

CONNECTING VIDEO DEVICES AND MONITOR

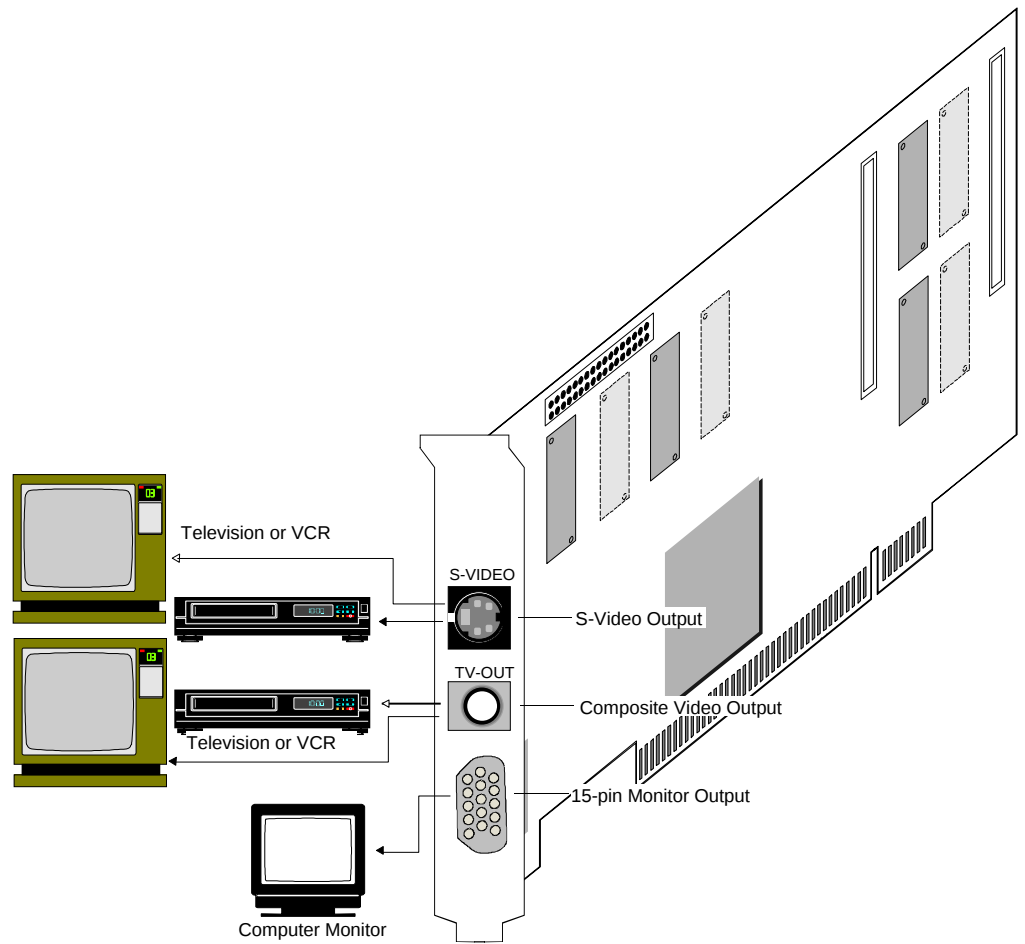
miroCRYSTAL VR 2000 / 4000 has a composite output (RCA jack) and an S-Video output (4-pin Mini-DIN).

1. Please connect the VCR and/or TV set to the video output/s using the suitable cables.



New VCRs and TV sets have composite as well as S-Video inputs. An S-Video input provides a better quality. Therefore connect the S-Video input of the device which you want to supply the better quality to the miroCRYSTAL VR 2000/ 4000 S-Video output.

2. Connect the monitor to the 15-pin monitor output. If you are unsure how to connect the monitor cable, please refer to the documentation that came with your monitor.
3. Finally, make sure that the computer and the monitor are connected to electrical power.



Connectors of miroCRYSTAL VR 2000 / 4000



Software installation (CD-ROM)

Software package

The CD-ROM includes miro drivers for Windows 95, the miroWINTOOLS (Windows 95 only) and Windows NT. Furthermore it includes S3 drivers for Windows 3.1x and OS/2 Warp. You will also find drivers for CAD applications and the miro3D-VIEWER (for DOS and Windows) you can use to display three-dimensional drawings in a 3D window.



Your miro graphics board offers new 3D acceleration technology. To be able to use the full function range of miroCRYSTAL 2000 / 4000, read the README file on the supplied CD before installing the software.

The miroSETUP-Manager

To install the miro drivers and applications under Windows 3.1x/95 from CD-ROM, you need the miroSETUP-Manager which is contained on the CD-ROM.

If other installation programs are started during the installation, the miroSETUP-Manager is minimized (Windows 3.1x) or placed into the taskbar (Windows 95). To resize the miroSETUP-Manager double-click (Windows 3.1x) / click (Windows 95) the icon. After the installation is completed, restart Windows.

You can easily create installation disks using the miroSETUP-Manager included in the package contents. You can also install the drivers using these disks. On how to do so, refer to the “Software installation (diskette)” section as of page 21.

Reading and printing the documentation

The *Documentation* menu item in the *miroSETUP-Manager Module Selection* window lets you install the Adobe Acrobat Reader, you can use to view and print the complete documentation.

1. If you have not done so already, start Windows 95.
2. Insert the miro CD-ROM into the CD-ROM drive.

The Setup program on the CD starts automatically.

3. Select the language you want to do the installation in and click *OK*.
4. In the *miroSETUP-Manager Module Selection* window, select the *Drivers and Programs* item.
5. Click *Documentation* and confirm your choice by clicking *Install... .*

The Adobe Acrobat Reader installation program is started.

1. To install Acrobat Reader, follow the instructions of the installation program.
After restarting the computer the Acrobat Reader Program Group is available which includes an icon for the detailed documentation in addition to the program icon.

	2. Double-click the icon to open the documentation.
Bookmarks	Selecting <i>View</i> and the <i>Bookmarks and Page</i> command will show you the contents for the manual. You can click the heading and you go directly to the corresponding chapter. A ➤ sign next to the heading indicates that there are further subheadings which become visible by clicking the ➤ icon.
Printing	To print a file, select the <i>File</i> menu and the <i>Print...</i> command.
Another language	If you want to View/print the documentation in another language, select the <i>File</i> menu and the <i>Open...</i> command. You recognize the languages by the letters _e (English); _d (German), _f (French). You find all files in the \MANUAL directory.
Further module	If you want to install further modules in addition to the Acrobat Reader, restart the miroSETUP-Manager.

miro DRIVERS FOR WINDOWS 95

As an alternative to the installation procedure described in the following, you can also install the miro drivers using the *Display Properties* dialog box. For more information on this procedure, refer to the README contained on the CD.

Requirements To install the software correctly, Windows has to be installed for VGA.

Installation

Once you have installed the miroCRYSTAL 2000 / 4000 board in your computer, the board will be detected as a new hardware component. After Windows 95 starts, the *New hardware found* dialog box will appear.

1. Click on the option *Select from a list of alternative drivers* in the *New hardware found* dialog box.
2. In the *Select Hardware Type* window double-click the *Display* option.
3. In the *Select device* window click *Standard display types* under *Manufacturer*; under *Models* select *Standard Display Adapters (VGA)*. Click on *Next*.

Windows will be restarted. Proceed as follows:

4. Insert the CD-ROM included in the miroCRYSTAL 2000 / 4000 package.

The miroSETUP-Manager is started automatically. Then you are in the *Language Selection* menu with the default setting *English*. By clicking *Information* you get information about the miroSETUP-Manager and its modules.

5. Click on *OK*. You are then in the *miroSETUP-Manager Module Selection*.

You have the option to install the miro drivers and programs and to view and print the documentation.

Exit/Back The *Exit* button closes the miroSETUP-Manager, with the *Back* button you go to the previous window.

6. In the *miroSETUP-Manager Module Selection* select *Drivers and Programs*.

Microsoft DirectX



Then you are in the *miroSETUP-Manager Drivers and Programs* menu. Here you can select which drivers and/or programs you want to install.

The prerequisite for the full function range of the miro drivers is that you install the DirectX driver. This contains all required software add-ons for the miro driver.

Before you install the graphics driver for Windows 95, install the Microsoft DirectX driver. For further information, refer to the README file provided on the CD.

7. Enable the *Microsoft DirectX* menu item. Follow the instructions on the screen.
8. If Windows requests you to do so, restart the system.
9. Restart the *miroSETUP-Manager*.
10. In the Taskbar select the *Start* menu and the *Run...* command.
11. Depending on your CD-ROM drive enter:
d:\miro_win<.,> where **d:** is the drive letter for your CD-ROM drive.
12. In the *miroSETUP-Manager Module Selection* select *Drivers and Programs*.
13. Enable the menu item *Drivers for Windows 95* and click *Install...* .
The miro installation program is started automatically.

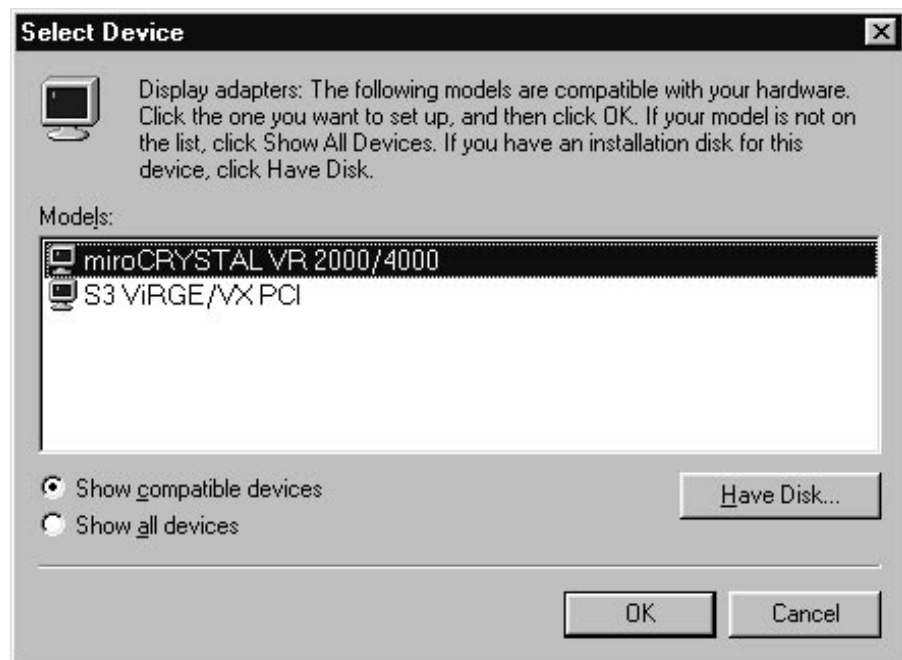
The miro installation program

First *Language selection* occurs. The default language is the language of the installed Windows 95 version.



1. Acknowledge with *Next*.
2. Now, in the *Select Components* dialog box, select the drivers and tools you want to install. Click on *Next* to copy the drivers and tools.
3. The *Setup Completed* dialog box appears. Click on *Finish*.

4. Now the *Display Properties* dialog box appears.
Choose the *Preferences* page and the *Change Display Type* button. Here you can select the graphics adapter and monitor model.
5. Click on *Change...* next to the graphics adapter.
6. Acknowledge *miroCRYSTAL 2000 / 4000* with *OK*.



7. Choose a different monitor by clicking on *Change...* next to *Monitor*.
8. In the *Select Device; Show all devices* window, select your monitor and click *OK*.



An incorrect selection can cause serious damage to your monitor. In case of doubt, please consult the documentation that came with your monitor. See the Appendix for more information on monitor selection.

9. In the *Change Display Type* dialog box click *Close*.
 10. Click *Apply* and answer *Yes* when being requested to restart the system.
- Upon completion of installation, the tools will be dropped in the *miroCRYSTAL 2000 / 4000* program group. Here you will find an option for deinstalling the tool.

DRIVERS FOR WINDOWS 3.1x

Installing Video for Windows

Video for Windows 1.1e supports the Microsoft Windows DCI technology (**D**evice **C**ontrol **I**nterface). DCI allows the video software to directly access the *miroCRYSTAL VR 2000 / 4000* hardware and to accelerate the image refresh considerably. The GDI (**G**raphics **D**evice **I**nterface) which was responsible for the image refresh up to this time is omitted.

To play back digital video AVI drivers are required. The supplied *miro* CD contains these drivers and a Setup program.

To install Video for Windows, proceed as follows:

1. If you have not done so already, start Windows.
2. Insert the miro CD in the CD-ROM drive.
3. In the Program Manager select the *File* menu and the *Run...* command.
4. Depending on your CD-ROM drive enter
d:\disksets\vwf_run<↵> where **d:** is the drive letter for your CD-ROM drive.
5. Follow the instructions on the screen.

Installation of Windows 3.1x drivers

On the CD supplied with your miro graphics board you find S3 drivers for Windows 3.1x.

To install these drivers, use the Windows Setup program.



To be able to install the software successfully, the standard VGA driver has to be installed for Windows.

If this is not the case,

1. switch to the Windows directory under DOS and call the setup program by entering **setup** <↵>.

2. From the list box located next to *Display*, select the VGA driver.

To install the drivers for Windows 3.1x, do the following:

3. If you have not done so already, start Windows 3.1x.
4. Start the *Windows Setup* program in the *Main Group* of the Program Manager.

The *Windows Setup* appears displaying the current hardware and software settings.

5. Select *Options* and the *Change System Settings* command.

The *Change System Settings* dialog box appears.

6. Select the arrow next to *Display* and go to the end of the list.
7. Select *Other*.

The Setup program requests you to insert the diskette containing the device driver.

8. Insert the CD from the miroCRYSTAL VR 2000/ 4000 package contents, overwrite the default directory with **d:\disksets\win31**, where **d:** is the drive letter of your CD-ROM drive, and select OK.

Then, the SETUP program shows you a list containing the drivers included on the CD-ROM.

9. Mark the S3 *Virge* driver offering the suitable resolution, number of colors, and font size (LF = Large Font; SF = Small Font).
10. Select OK. The corresponding files will now be copied into the Windows system directory.

Now a dialog box requesting you to restart Windows appears.

11. Confirm this question to restart Windows.

S3 Refresh DOS tool

The package contents of your board include the **S3REFRSH.EXE** program you can use to select higher refresh rates for your monitor under Windows 3.1x.



Please make sure that you only select refresh rates your monitor supports. If you are not sure about which maximum refresh rate your monitor supports, refer to your monitor's manual.

On page 44 you will find a list of maximum refresh rates the miroCRYSTAL VR 2000 / 4000 offers.

It is recommended to copy the S3REFRSH.EXE program from the miro CD to your Windows system directory (located in **d:\disksets\win31**).

1. Go to the corresponding directory in DOS and call the program by entering

s3refrsh<↵>

Then, a list appears which shows you all possible resolutions/image refresh rates the miroCRYSTAL VR 2000 / 4000 boards offer. Combinations you cannot select are marked with a **✕**.

2. Select the desired image refresh rates by clicking into the empty square.

Then a **✓** appears in the square.

3. After you have made all settings, quit the program entering *Exit*.

You will be asked if you want to save the settings in the AUTOEXEC.BAT file. If you confirm the message, the program call and additional parameters (e. g. S3REFRSH d1af) are added to your AUTOEXEC.BAT file. When clicking *Cancel*, all settings will be rejected. Clicking *No* keeps the settings until the next time you start the system.

4. Restart your system.

The new settings are now available under Windows.

miro DRIVERS FOR WINDOWS NT 3.5x

The CD-ROM also contains miro Windows NT 3.5x drivers. You cannot install these drivers using the miroSETUP-Manager.

Create installation disks using the miroSETUP-Manager. On how to create installation disks, refer to "Creating installation diskette(s)" on page 21.



For detailed information on the installation and the configuration, refer to the README.TXT file on the CD-ROM.

It is required that you have installed Windows NT 3.5x with a graphics driver for your VGA board.

If this is not the case, install Windows NT 3.5x for VGA. After you restarted the system, you can install the miro drivers.

Proceed as follows:

1. Select *Control Panel* from the *Main Group* and double-click the *Display Tool*.

2. In the *Display Settings* window click *Change Display Type*.
3. Click the *Change...* button.
4. The *Select Device* window offers you an overview over all installed drivers that are already installed. Select *Other...* .
You are now requested to insert another disk.
5. Insert the installation disk into the disk drive. Depending on the disk drive you use, enter **a:** or **b:** and click *OK*.
6. The *Select Device* window shows you the driver for your board at the end of the driver list.
7. Select the graphics board installed in your computer.
8. Confirm the following message.
9. If you had already installed the driver, you are asked whether you want to install the old or the new driver. Start the installation of a new driver by clicking the *New* button.
11. Click the *Continue* button to proceed with the installation.
12. Confirm the message telling you that the driver is only available after restarting the computer.
13. Also confirm the question requesting you to restart Windows NT.

After the restart the driver which has just been installed is active with the lowest resolution.

You can use the miroMONITOR SELECT tool to select a monitor (page 15) and then select a resolution (page 16).

miro DRIVERS FOR WINDOWS NT 4.0

The miro drivers for Windows NT 4.0 cannot be installed with the miroSETUP-Manager.



For more details on the installation and configuration, refer to the README.TXT file on the CD-ROM in the WINNT40 directory.

For a successful installation of the drivers it is vital that Windows NT 4.0 has been installed on your computer with a Standard VGA driver.

If this is not the case, install Windows NT 4.0 in the VGA mode after the hardware installation. After restarting the system, install the miro drivers.

Proceed as follows:

1. Click the *My Computer* icon to open the *My Computer* window to start the *Control Panel* program.
2. Start the *Display* tool to adjust/select the video display and switch to the *Settings* section.
3. In the *Display Properties* window, select the *Change Display Type* button.
4. The *Display Type* window offers an overview of the currently active display driver. Please activate the *Change...* button.

5. The *Select Device* window offers you an overview of all display drivers supplied with your Windows NT 4.0 Installation. Please select the *Have Disk...* button.
6. In the *Install from Disk* window overwrite the default setting with **d:\disksets\winnt40**, where **d:** is the letter of your disk drive containing your installation software. You can search your drivers by using the *Browse* button. Only files with the file name extension **.inf** are displayed. The file you have to look for is named **mirosing.inf**.
7. After selecting the proper file you choose the installed graphics board from the *Change Display* window. Select your board and press OK or double-click the appropriate entry in the list.
8. Select *YES* in the *Third-party Drivers* message box. The driver files are now being copied to your hard disk.
9. Close the *Display Type* and the *Display Properties* windows and reboot the computer.

After the restart the driver which has just been installed is active with the lowest resolution. You can now select a monitor and change the resolution.

miro Monitor Select - Control Panel extension

Proceed as follows:

1. By using the *Icon My Computer*, you can start the *Control Panel* program..
2. To select a monitor, start the *miro Monitor Select* tool.
The title is the name of your graphics board.
3. Select your monitor from the *Monitor* list. If your monitor is not listed, select the monitor from the *Multi Frequency* monitors with the frequency which comes close to the frequency of your monitor.
4. After a short while you see the *Available Resolutions* list which gives you an overview of all resolutions supported by your monitor and the horizontal and vertical refresh rates. Please make sure that you do not select a horizontal scan frequency which is higher than the horizontal scan frequency of your monitor.
5. To confirm your selection, click *OK* or click *Cancel* to keep the selected monitor.
6. In the *Monitor Settings Change* window you can restart your computer immediately by pressing the *Restart Now* button. You can also click the *Don't Restart Now* button to get back to the *Control Panel* program.
7. Restart the system using the taskbar.
8. After the restart the selected monitor is active. If the resolutions and refresh rates differ from the settings of the previous monitor, the system will notify you.



PLEASE NOTE: The *miro Monitor Select* icon is only available in the *Control Panel* program, if a driver installed from this disk is currently active.

Changing the resolutions

To change the resolution, proceed as follows:

1. By using the *My Computer* icon, you can start the *Control Panel* program..
2. Start the *Display* tool to select/change the video display.
3. The *List All Modes* button lists the resolutions your board and your monitor support and the number of colours and frequencies. Double-click to select a resolution.
4. You can also use the *Desktop area* slider, the *Color Palette* and the *Refresh Frequency* windows to select a resolution. Keep in mind that the settings are interdependent. If you select an invalid setting, the other options change so that a valid setting is restored.
5. To check the selected resolution in a testscreen, click the *Test* button and confirm.
 - ♦ Is the selected resolution/frequency displayed on the monitor?
 - ♦ Is the correct resolution specified?
 - ♦ Are the arrows in the testscreen margins visible?
 - ♦ Are the coloured and the hatched areas displayed correctly?After five seconds the testscreen disappears and you see the workspace again.
6. If the resolution on the testscreen is *OK*, confirm the *Testing Mode* window with *Yes*.
7. *Windows NT 3.5x*:
Restart the system.

Windows NT 4.0:

The new graphics mode will be displayed immediately.

DRIVERS FOR OS/2 WARP

The CD-ROM also contains OS/2 Warp drivers. You cannot install these drivers using the miroSETUP-Manager.

Create installation disks using the miroSETUP-Manager. On how to do so, refer to the “Creating installation diskette(s)” section on page 21.



The installation disk must have the disk name **S3 DRV1**. To assign a name to your disk, use the DOS or the OS/2 command LABEL.
The diskette must not be write-protected.

To install the miro drivers for OS/2,

1. Start OS/2 in the VGA mode and open the OS/2 prompt.
 2. Insert the installation disk into your disk drive.
 3. At the OS/2 prompt enter **a:setup<↵>** or **b:setup<↵>**, depending on the disk drive you use.
 4. Click the <Y> key to confirm your choice.
- The system files are now being copied.

For detailed information on the installation and the configuration, refer to the README.TXT file on the CD-ROM in the OS2 directory.

DRIVERS FOR CAD

The CD-ROM includes the following drivers:*

Application	Driver
AutoCAD 10/386 (DOS)	ADI driver
AutoCAD 11/386 (DOS)	ADI driver
AutoCAD 12/13 (DOS)	ADI driver
AutoCAD 13/Windows 3.1x	miroGTI 13 Win
AutoCAD 13/Windows NT	miroGTI 13 Win
AutoCAD 13/Windows 95	miroGTI 13 Win

In addition, the miro3D-VIEWER belongs to the package contents of the miro board. For a detailed description of this 3D-CAD application, refer to chapter 6.

CAD drivers for Windows	To install the CAD drivers for Windows 95/3.1x/NT , start the appropriate Windows version. You can install the drivers from CD-ROM or (with exceptions) from disk.
CAD drivers for DOS	You can install the CAD driver for DOS under DOS or under Windows 95 using the miroSETUP-Manager.

Configuring the CAD drivers

After installing the miro CAD drivers, you may have to configure these.

miroGTI 13 Win	You will find general information on miroGTI 13 Win in this manual (page 25). For detailed instructions on the configuration and a detailed description of the functions, refer to the online help supplied for this driver.
ADI driver	To configure the ADI driver, read the “ADI driver” section (page 27).

CAD driver for Windows 95 (miroGTI 13 Win)

To be able to use miroGTI 13 for Windows NT, install the windows extension WinG first from the miro CD. WinG is located in the \WinG directory and is installed by calling **Setup**.

To install the miro CAD driver for Windows 95 (miroGTI 13 Win) and the miro3D-VIEWER, proceed as follows:

1. If you have not done so already, start Windows.
2. Insert the CD-ROM included in the miroCRYSTAL 2000 / 4000 package.

The miroSETUP-Manager is started automatically. Then you are in the *Language Selection* menu with the default setting *English*.

3. Click on *OK*. You are then in the *miroSETUP-Manager Module Selection*.

* Depending on the delivery scope, the actual disk contents may be different from the disk contents listed in the manual.

4. In the *miroSETUP-Manager Module Selection* select *Drivers and Programs*.
- Then you are in the *miroSETUP-Manager Drivers and Programs* menu.
5. Enable the menu item *Drivers for CAD (Windows)* and click *Install...* .
- After starting the installation program the Language Selection menu appears in *English*.
6. Click on *Install*.
 7. Select the driver you want to install.
 8. Accept or overwrite the directory to which you want to copy the driver.
 9. Click *OK* to confirm.
- The driver is now being copied to the hard disk.

CAD driver for Windows 3.1x (miroGTI 13 Win)

To be able to use miroGTI 13 for Windows NT, install the windows extension WinG first from the miro CD. WinG is located in the \WinG directory and is installed by calling **Setup**.

To install the miro CAD drivers for Windows 3.1x (miroGTI 13 Win), proceed as follows:

1. If you have not done so already, start Windows.
2. Insert the CD-ROM included in the miroCRYSTAL 2000 / 4000 package in the CD-ROM drive.
3. In the Program Manager select the *File* menu and the *Run...* command.
4. Depending on your CD-ROM drive enter:
d:\mirowin<↵>
 where **d:** \ is the drive letter of your CD-ROM drive.

You are then in the *miroSETUP-Manager Module Selection*.

5. In the *miroSETUP-Manager Module Selection* select *Drivers and Programs*.
- Then you are in the *miroSETUP-Manager Drivers and Programs* menu.
6. Enable the menu item *Drivers for CAD (Windows)* and click *Install...* .
- After starting the installation program the Language Selection menu appears in *English*.
6. Click on *Install*.
 7. Select the desired driver.
 8. Accept or overwrite the directory to which you want to copy the driver.
 9. Click *OK* to confirm.
- The driver will be copied to your hard disk.

CAD drivers for Windows NT (miroGTI 13 Win)

To be able to use miroGTI 13 for Windows NT, install the windows extension WinG first from the miro CD. WinG is located in the \WinG directory and is installed by calling **Setup**.

Windows NT 3.5x

To install CAD drivers for Windows NT 3.5x, perform the same installation steps under Windows NT as for CAD under Windows 3.1x (“CAD driver for Windows 3.1x” section, page 18).

Windows NT 4.0

To install CAD drivers for Windows NT 4.0, perform the same installation steps under Windows NT as for CAD under Windows 95 (“CAD driver for Windows 95” section, p. 17).

CAD under DOS

The driver for CAD under DOS supports AutoCAD versions 10/386, 11/386, 12 and 13.

You can install the CAD driver for DOS under DOS or under Windows 95 using the miroSETUP-Manager.

Installation under DOS

To install the drive under DOS, proceed as follows:

1. Insert the CD-ROM in the CD-ROM drive.
2. Depending on your CD-ROM drive enter:
d:\disksets\cad\install.exe<↵>,
where **d:** is the drive letter of your CD-ROM drive.

The installation program is started.

Installation under Windows 95

1. If you have not done so already, start Windows 95.
2. Insert the CD-ROM included in the miroCRYSTAL VR 2000 / 4000 package contents.

The miroSETUP-Manager is automatically started. You go to the *Language Selection* menu which has *English* as a default setting.

3. Click *OK*. Now you are in the *miroSETUP-Manager Module Selection* window.
 4. In the *miroSETUP-Manager Module Selection* window select the *Drivers and programs* menu item.
 5. Enable *Drivers for CAD (DOS)* and click *Install...* .
- The installation program is started.

The installation program

The installation program is operated via the keyboard.

To mark a menu item, move the cursor bar to the menu item using the arrow keys and press the space key. To perform the action, press <↵>.

<↵>/<ESC> Press <↵> to proceed in the installation program, press <ESC> to end the program.

AutoCAD 10/11 386

1. Enter the drive where you have installed AutoCAD.
2. Use the arrow keys to select the AutoCAD version which is installed on your computer and for which you want to install the drivers.
3. Enter the drive to which you want to copy the drivers. Default is the \TURBODLD subdirectory.
The installation program will also create a new subdirectory which does not exist yet.
4. Confirm the path you selected again by clicking *Yes; Continue*.
The driver will be installed.

The installed driver will not be configured by the installation program but by AutoCAD. To go on with the configuration, proceed as described in the “CAD drivers” section under “ADI driver” (page 27).

- AutoCAD 12/13**
3. Enter your AutoCAD\DRV directory to which you want to copy the driver.
Default is \ACAD\DRV.
The installation program will also create a new subdirectory which does not exist yet.
It is, however recommendable to accept the default \DRV.
 4. Confirm the path you selected again by clicking *Yes*; *Continue*.
The driver will be installed.
The installed driver will not be configured by the installation program but by AutoCAD. To go on with the configuration, proceed as described in the “CAD drivers” section under “ADI driver” (page 27).



Software installation (diskette)

To create installation disks, use the *miroSETUP-Manager* included on the CD-ROM. Disks can also be obtained from the *miro Support-Mailbox*.

Creating installation diskette(s)

To create installation diskettes, you need a formatted 3,5" diskette. Proceed as follows:

1. If you have not done so already, start Windows 95.
2. Insert the *miro* CD-ROM into the CD-ROM drive.

The Setup program starts automatically.

3. Select the language you want to do the installation in and click *OK*.
4. In the *miroSETUP-Manager Module Selection* window, select the *Drivers and Programs* item.
5. Select the driver you want to install and click *Disk(s)*.
8. Insert the required diskette(s) into the disk drive: the installation diskette(s) will be created.

Use the *Quit* button to quit the *miroSETUP-Manager*.

WINDOWS 95 (HARD DISK)

It is not possible to copy the driver software for Windows 95 to diskettes. You can also install the *miro* drivers by doing the following:

1. If you have not done so already, start Windows 95.
2. Create a directory on your hard disk.
3. Copy the Windows 95 directory contents from the CD-ROM (located in the `\disksets` directory) into this directory.
4. In the Windows 95 *Explorer* double-click the **SETUP . EXE** file in the directory you created.

The *miro* installation program is started automatically.

For a detailed description of the installation program refer to chapter "Software installation (CD-ROM)" and to the section "The *miro* installation program" as of page 10.

DRIVERS FOR WINDOWS 3.1X

Create installation disks using the *miroSETUP-Manager*. On how to create installation disks, refer to the "Creating installation diskette(s)" section (see above).

To install the drivers for Windows 3.1x, proceed as described in the „Installation of Windows 3.1x drivers“ section in steps 3. to 7. on page 12.

8. Insert the first diskette from the installation diskette set into the disk drive. Overwrite the default with **a:\install**<↵> or **b:\install**<↵> and click on *OK*.

The SETUP program will show you a list with the drivers located on the CD-ROM.

9. Select the *S3 Virge* driver with the suitable resolution, number of colors, and font size in the list (LF = Large Font; SF = Small Font).
10. Select *OK*. The corresponding files will now be copied to the Windows system directory.

Now, a dialog box which requests you to restart Windows appears.

11. Confirm this message.

The S3 Refresh DOS tool (see also page 13) lets you select higher refresh rates for your monitor.

DRIVERS FOR OS/2 WARP

Create installation disks using the miroSETUP-Manager for OS/2 Warp. On how to create installation disks, refer to “Software installation (diskettes)” on page 21.



The installation diskette must have the diskette name **S3 DRV1**. To assign a name to your diskette, use the DOS or the OS/2 command LABEL. The diskette must not be write-protected.

- To install miro drivers for OS/2, proceed as described on page 16 in the “Drivers for OS/2 Warp” section.

For detailed information on the installation and configuration, refer to the README.TXT file on the CD-ROM in the OS/2 Warp directory.

DRIVERS FOR CAD

For general information on the CAD drivers, refer to the “Software installation (CD-ROM)” in the “Drivers for CAD” section as of page 17.

CAD driver for Windows 95

To install the driver, proceed as follows:

1. If you have not done so already, start Windows 95.
2. Create a directory on your hard disk.
3. Copy the disk contents to this directory.
4. In the *Explorer* double-click the INSTALL.EXE file from the corresponding directory.

After starting the installation program the Language Selection menu appears in *English*.

5. Click on *Install*.
6. Select the desired driver.

7. Accept or change the directory to which you want to copy the driver.
8. Click *OK* to confirm.

The driver will be copied to your hard disk.

CAD driver for Windows 3.1x

If you created installation disks for Windows 3.1x using the *miroSETUP-Manager*, you can start the installation from diskette.

On how to create installation disks, refer to the “Software installation (diskette)” section on page 21.

To install the CAD drivers for Windows 3.1x, proceed as follows:

1. If you have not done so already, start Windows 3.1x.
2. Insert the installation diskette into the disk drive.
3. In the Program Manager select the *File* menu and the *Run...* command.
4. Depending on your disk drive, enter **a:\install<↵>** or **b:\install<↵>** and click on *OK*.

The installation program is started.

After starting the installation program the Language Selection menu appears in *English*.

5. Click on *Install*.
6. .Select the desired driver.
7. Accept or change the directory to which you want to copy the driver.
8. Click *OK* to confirm.

The driver will be copied to your hard disk.

CAD drivers for Windows NT

To be able to use *miroGTI 13* for Windows NT, install the windows extension *WinG* first from the *miro* CD. *WinG* is located in the *\WinG* directory and is installed by calling **Setup**.

Windows NT 3.5x

To install CAD drivers for Windows NT 3.5x, perform the same installation steps under Windows NT as for CAD under Windows 3.1x (“CAD driver for Windows 3.1x” section, see above).

Windows NT 4.0

To install CAD drivers for Windows NT 4.0 zu installieren, perform the same installation steps under Windows NT as for CAD under Windows 95 (“CAD driver for Windows 95” section, p. 22).

CAD for DOS

1. Insert the first diskette from the installation diskette set into the disk drive.
2. Depending on your disk drive, enter **a:\install<↵>** or **b:\install<↵>**.

The *miro* installation program is started automatically.

For a detailed description of the installation program refer to section “CAD under DOS” on page 19.



miroGTI 13 Win

Overview

miroGTI 13 Win is a powerful display and rendering driver compatible with the Autodesk **D**evice **I**nterface (ADI) 4.2. miroGTI 13 Win operates as a displaylist driver that stores the picture sent by AutoCAD in a displaylist. miroGTI 13 Win supports AutoCAD 13, miroGTI 13 Win supports AutoCAD 13. miroGTI 13 Win runs in the Protected Mode of the 80386/80486 processors, offering maximum speed. Some enhanced features contributes to even more user-friendliness:

- ♦ 32-bit support in the displaylist
- ♦ miroBIRDEYE
- ♦ miroSPOTVIEW

miroGTI 13 Win adds more speed to working with AutoCAD for Windows by using 32 Bit code for all drawing operations, regens etc. Windows processes displays menus, dialog boxes etc. with 16 bit. This provides miroGTI 13 Win a PC with Workstation processing speed.

miroGTI 13 Win supports AutoCAD 13 for Windows, including the **A**dvanced **M**odelling **E**xtension (AME) and **A**dvanced **V**isualization **E**xtension **R**ender (AVE).

System requirements

To take full advantage of all features the miroGTI 13 Win has to offer, you need a 386/486 computer with at least 8 Mbyte RAM. We recommend 16 Mbyte RAM or more. You have to install Windows 3.1 and the Windows 3.1 drivers delivered by miro.

Special features

Here an overview of the features of miroGTI 13 Win:

32-bit support

The miroGTI 13 Win displaylist use 32-bit entries to perform zoom operation with factors up to 1.5 million without regenerating the drawing.

miroBIRDEYE

miroBIRDEYE is a powerful tool for users to zoom a drawing or to enlarge details. It makes it easier to keep a clear overview of large drawings with easy panning for any viewport.

miroSPOTVIEW

miroSPOTVIEW is a kind of magnifying glass. Due to miroSPOTVIEW the part of a drawing where the cursor is located can be enlarged in a split second.

Configuring AutoCAD and miroGTI 13 Win

Before using miroGTI 13 Win with your AutoCAD program, you have to reconfigure AutoCAD to recognize the driver. Proceed as follows:

1. Start Windows.
2. Start AutoCAD. Now you see the Drawing Editor.
3. From the *FILE* menu select *configure*.
4. Switch to the *configuration* menu and select from the video displays *miroGTI 13 Win*.

The miroGTI 13 Win tool bar appears.

For a detailed description of all miroGTI 13 Win functions refer to the online help.

ADI DRIVER

Before you use the driver for the first time with your AutoCAD program, it is required that you reconfigured AutoCAD.

AutoCAD 10/11 386

In the **\TURBODLD** directory you will find the FASTACAD.BAT file.

1. Start the FASTACAD.BAT file.

In doing so, the environment variables are set. We recommend to enter the call of this batch file into your AutoCAD start batch file.

2. Start AutoCAD with the **-r** parameter (only for the first-time configuration).
3. Select the item for the video configuration in the configuration menu.
4. Under the listed video displays, select *ADI P386 v4.0/4.1 display*.

Now the Configuration Utility is started.

5. Answer the questions.
6. Then answer the AutoCAD standard questions on the driver configuration.

AutoCAD 12/13

If you selected another AutoCAD subdirectory than **\DRV**, adapt the ACADDRV environment variable so that it points to this directory.

1. Start AutoCAD with the **-r** parameter (only for the first-time configuration).
2. Select the item for the video configuration in the configuration menu.
3. Under the listed video displays, select *TurboDLD-Classic*.

Now the Configuration Utility is started.

4. Answer the questions.
5. Then answer the AutoCAD standard questions on the driver configuration.



miro3D-VIEWER for AutoCAD under Windows

INTRODUCTION

The miro3D-VIEWER is a software expansion developed by miro for miroGTI 13 Win (driver for AutoCAD 13 under Windows) allowing the AutoCAD user to view three-dimensional drawings in a 3D window. The drawings can be displayed in perspective as a wireframe or using different shading methods. The miro3D-VIEWER is suited for simulating technical processes, visualizing architectural plans, and presentations.

The miro3D-VIEWER is an ADS (AutoCAD Development System) application; the drawing data is read directly from the AutoCAD data base.

Hardware requirements

To work with the miro3D-VIEWER, you need a **386 PC** at least with **8 Mbytes of memory** (16 Mbytes are recommended). In addition, you need a **mouse**.

Software requirements

Windows 3.1x, Windows 95 or Windows 95;
AutoCAD 13 for Windows 3.1x/95/NT has to be installed.

Features

To manipulate AutoCAD drawings, the 3D-VIEWER offers a number of powerful features:

Display types

AutoCAD drawings can be shown in a window in perspective as a wireframe, with or without hidden lines, or using Flat shading or Gouraud shading. To achieve smoother color transitions, shading is supported by color dithering.

Positioning the camera/the object

The camera functions allow to set the camera's angle of vision and to adjust parameters such as the focal length (zoom factor) and the distance between the camera and the object interactively and dynamically. You can also move the object in space. Rotations around the object or the camera can be performed directly using the mouse.

Zoom/Pan

The mouse allows to zoom and pan in real time.

More speed

The miro3D-VIEWER computes Gouraud shading or hidden lines faster than AutoCAD's "Render" function.

Clipping planes

The miro3D-VIEWER has a number of functions to activate and move clipping planes (right, left, above, below, in front of, behind the object). In doing so, parts can be cut off the object so the inner parts become visible.

Projections

There are two projection types for three-dimensional representations: the

parallel projection and the *perspective projection*. The simpler projection type is the *parallel projection*. The parallel projection is not as computation-intensive and is therefore suited to provide quick overviews. The *perspective projection* where the lines meet at vanishing points is closer to reality since it simulates a person's natural way to see things.

Layer Control

This sub-menu switches off all or individual layers which then are not displayed.

Light

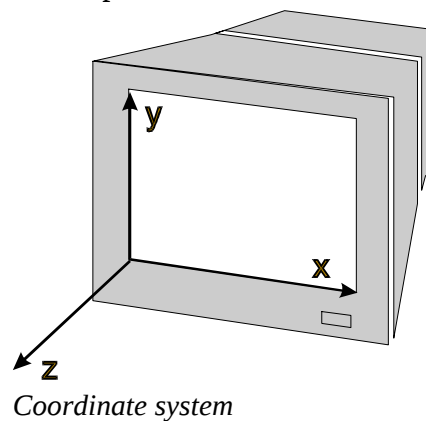
This sub-menu allows you to specify the position of a light source, to fix the light source or to illuminate the backface in addition to the front of an object.

Displaying Objects in 3D

Polygons (surfaces which are flat and bounded by straight lines) play an important role when creating 3D drawings. A polygon is the most common element to form a surface. Every object can be defined by polygons. In this way, round objects such as spheres can be reproduced using a mesh of polygons.

Depending on the amount of stored information about an object there are three main categories: the wireframe, the surface model and the volume model. The last one is the most complex one to compute.

For representing objects in the computer a three-dimensional coordinate system consisting of an x, a y and a z axis serves as reference model. The screen forms the xy plane, the z axis is located vertically relative to the screen plane.



LOADING THE miro3D-VIEWER

Before calling the miro3D-VIEWER an AutoCAD drawing should be loaded.

1. Start AutoCAD.
2. Load a drawing with the **Open** command.
3. Enter **ami_miro3d** in the AutoCAD command line.

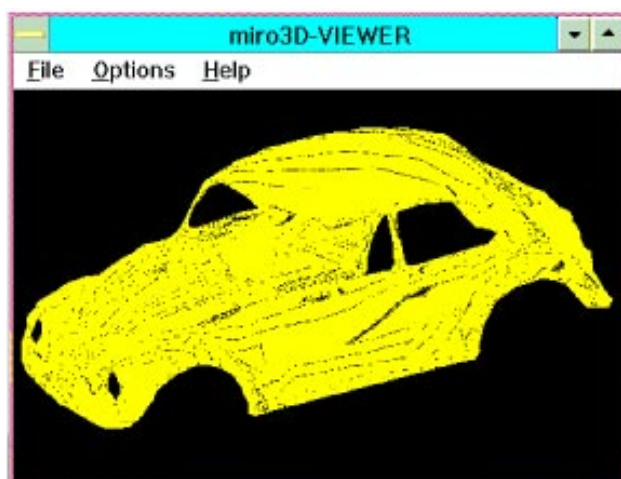
After loading the miro3D-VIEWER, the miro3D-VIEWER window appears and contains the drawing loaded under AutoCAD.



AutoCAD can be loaded several times, the miro3D-VIEWER can only be loaded once.

miro3D-VIEWER WINDOW

The miro3D-VIEWER window remains open together with the AutoCAD window and can be maximized, minimized and shrunk to an icon as is usual for Windows.



This window contains three menus: **File**, **Options** and **Help**.

File:

This menu contains the **Copy** command, which copies the miro3D-VIEWER window content to the Clipboard. When doing so it is important that the complete miro3D-VIEWER window is visible. The **Exit** command ends the miro3D-VIEWER.

Options:

This menu contains the **Settings** command, which calls the miro3D-VIEWER dialog box. This dialog box can also be called using the <> key.

Help:

This menu contains the **Info...** command giving information about the miro3D-VIEWER version.

miro3D-VIEWER DIALOG BOX

Calling the dialog box

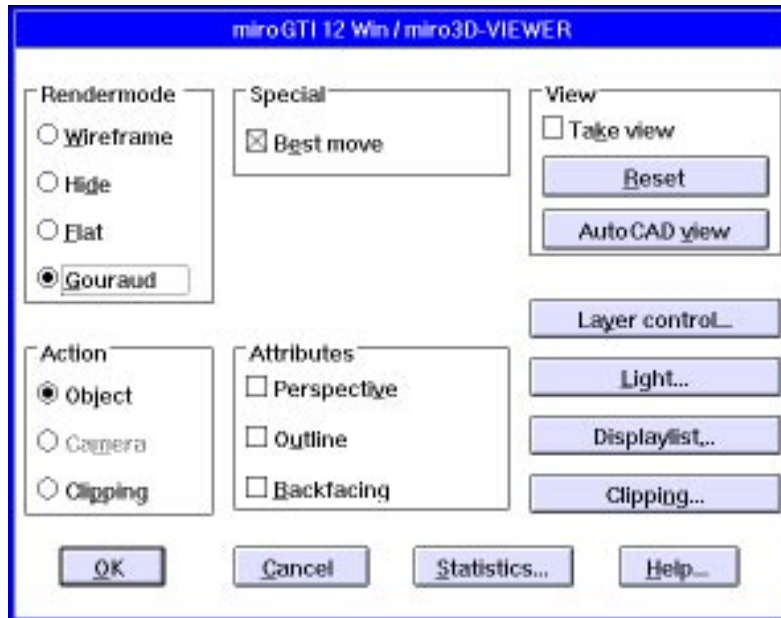
The dialog box can be called in different ways depending on whether the - AutoCAD or the miro-3D-VIEWER window is active:

a) AutoCAD window:

Enter **ami_3dmenu** in the AutoCAD command line.

b) miro3D-VIEWER window:

Under **Options** select **Settings** or press the <F3> key.



The miro3D-VIEWER dialog box is divided into the **Rendermode**, **Special**, **View**, **Action** and **Attributes** column. Besides the option buttons **Layer Control**, **Light**, **Displaylist** and **Clipping** are available. The columns contain option buttons, check boxes and command buttons. As usual under Windows, option buttons represent mutually exclusive items, in contrast, as many check boxes as are appropriate can be selected.

The following sections explain the miro3D-VIEWER functions. To become familiar with the program as quickly as possible, we recommend that you perform the steps described as you read the manual.

If no appropriate drawing is available load the standard drawing delivered by miro. To do so, select **Displaylist** in the Control column and click **Demo** in the submenu.

Rendermode

In this column different display methods for your drawing can be activated. The choices are: wireframe, surface with hidden lines, and volume model.

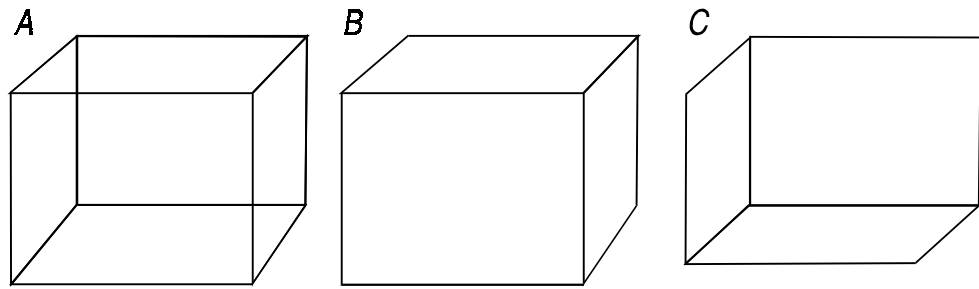
Wireframe

It is the simplest display method: all outlines of the polygons are drawn without allowing for light and shadow. It is the quickest method and well suited for swiftly rotating models around a given angle.

Hide (surface model with hidden lines)

This 3D model is also a wireframe model. The hidden lines are, however, not shown which makes this model clearer than a wireframe model where all lines are shown.

It is a general problem with the wireframe model that it is not always easy to distinguish the front view from the rear view. As an explanation: Is the following model A seen from the top or from the bottom? The illustrations of the wireframe model with “hidden lines” (B and C) make things more clear.



Wireframe

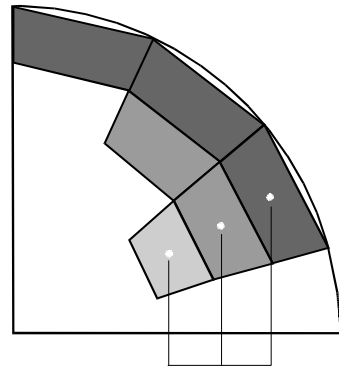
Surface

Surface

The shading methods represent the transition from the surface model to the volume model:

Flat

With the flat shading method the color transitions which correspond to the facets of the objects are abrupt. The object appears faceted since for each surface polygon the mean intensity is calculated and each polygon is filled with one color. Flat shading is the fastest shading algorithm and is well suited for checking design drawings.



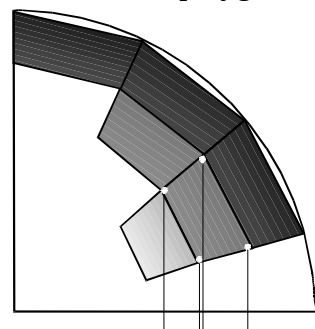
Mean intensity

Flat shading

Gouraud

If an object is shaded using the Gouraud method, its surface is represented more realistically than with the flat shading method.

There are smooth color transitions, round edges appear round and not angular. With Gouraud shading the intensity is calculated at the vertices of the polygon and interpolated for the points between these vertices. Thus, each surface polygon has varying intensities creating smooth transitions.



Intensity of the vertices

Gouraud shading

Attributes

Perspective

Here you can switch the perspective projection on and off. If you have selected *Camera* in the **Action** column, the perspective projection is automatically switched on.

Outline

The outlines of the individual object surfaces are shown independently of the render mode.

Backfacing

This technique omits drawing the surfaces at the back of objects. This technique not only eliminates elements which are not visible but also accelerates the rendering process considerably. Objects that are shaded using the Flat or the Gouraud shading technique can thus rotate smoother.

Special

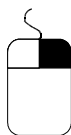
Best Move

As long as you press any mouse key, the objects in the drawing are always drawn as wireframe model to achieve the best performance possible. By releasing the mouse key the shading method selected before is enabled.

Action

Object

This button enables rotating the object and zooming and panning operations with reference to the object. You can enable the functions by clicking a mouse key or clicking two mouse keys simultaneously. After clicking this option key and the *OK* button you get back to the *miro3D-VIEWER* window.



Rotating

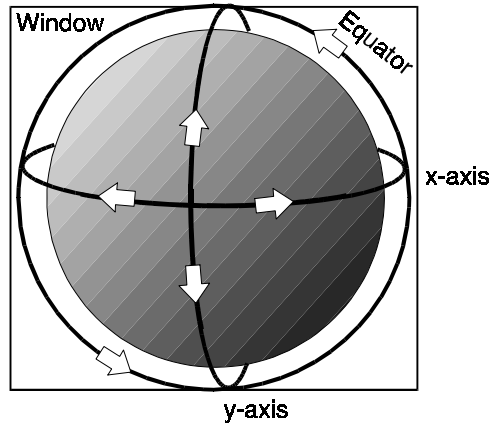
This function rotates the object in space. The mouse guides the movement of the object. The object always rotates around its rotation centre (usually this is the object's centre). To enable this function hold down the right mouse key.

The *miro3D-VIEWER* rotates in two steps:

1. It calculates the rotation axis and the angle around which the object shall be rotated.
2. It applies the calculated rotation axis and angle to the object.

As to 1.:

The following model shows the principle behind the calculation of the rotation axis: Imagine the window is surrounded by a sphere the centre of which is the window's centre. The rotation axis and the angle is calculated on the basis of the cursor movement.



Rotating object

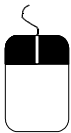
As to 2.:

The calculated axis and the angle are displaced in parallel into the rotation centre of the object. The object is rotated around the calculated angle and the axis.

This becomes especially clear if the rotation centre of the object is the same as the centre of the window. In this case the rotation movement of the object follows the mouse cursor. Rotating around the three main axis is achieved in the following way:

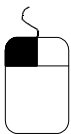
- ♦ Moving the cursor vertically through the centre of the window causes a rotation around the **x axis**.
- ♦ Accordingly, moving the cursor horizontally through the centre causes a rotation around the **y axis**.
- ♦ Moving the cursor along the “equator” that is along the boundaries of the window causes a rotation around the **z axis**.

Moving the cursor in any other direction rotates the object around another axis (see model).



Zoom

This zoom function has the same effect as changing the focal length of a camera. To zoom press the left and the right mouse key simultaneously and move the mouse. By moving the mouse upward the object becomes larger, moving the mouse downward makes the object smaller.



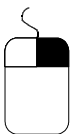
Pan

When you press the left mouse key and move the mouse, the object follows the movement of the mouse. The object moves in x or y direction.

Camera

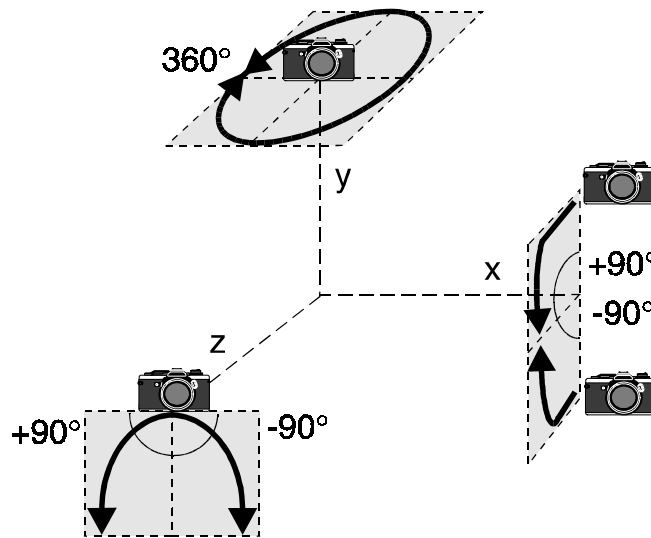
This option rotates the camera, and performs zoom and pan operations with reference to the camera.

You can perform these functions by pressing one mouse key or by pressing two mouse keys simultaneously. After clicking this option and the OK button you get back to the miro3D-VIEWER window.



Rotating

With this operation the camera is the center of rotation. This function is comparable to a camera located at a fixed position which rotates, tilts or swivels around its axis. You can use this function by holding down the right mouse key. The following illustration shows the rotation, tilt and swivel movements the camera can perform:



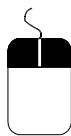
Rotating the camera

The rotating movements around the axes equal the following camera movements:

y axis: the camera rotates around its own axis

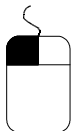
x axis: the camera tilts up and down

z axis: the camera tilts to the side



Changing the distance between camera and object

This function allows to increase and to decrease the distance between the camera and the object. To do so, press the right and the left mouse key simultaneously and move the mouse. Moving the mouse upward moves the camera towards the object. Moving the mouse downward increases the distance between the camera and the object. This function makes it possible to “walk through” objects.

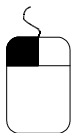


Pan

By pressing the left mouse key and moving the mouse the camera follows the movement of the mouse.

Clipping

In clipping mode you can select and move a clipping plane that is colored. After clicking this radio button and clicking the OK button in the main menu the object enclosed by a clipping box appears on the screen. One clipping plane is colored. This means, that it has been selected and can be moved.

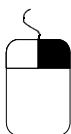


Selecting another clipping plane:

If you want to select another clipping plane, click with the right mouse key into its centre. If the centre is covered up, it is enough to click the mouse as closely to the desired plane as possible.

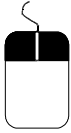
Moving of the clipping plane:

By pressing the left mouse key you can move the clipping plane, that is always towards or away from the opposite plane.



Rotating:

To facilitate selecting the clipping planes (in case the desired plane is covered), the object can be rotated using the right mouse key.



Zoom:

To zoom press the left and the right mouse key simultaneously. Moving the mouse upwards enlarges the object, moving the mouse downward decreases the object.

View

Take View

After selecting this button and quitting the miro3D-VIEWER main menu with the *OK* button the current 3D-VIEWER view is given to AutoCAD.

Reset

Displays a top view of the drawing.

AutoCAD View

If you got lost once in 3D space this function also helps you to find your way again: you will see the view you saw when the drawing was loaded. In doing so, the render mode which has been switched on remains the same. The perspective is taken from AutoCAD.

Following up the option buttons *Layer Control*, *Light*, *Displaylist* and *Clipping* are described. When pressing these buttons submenus appear.

Layer Control

The **Layer Control** submenu allows to control the drawing layers defined in AutoCAD.

Layer name/State

In the *Layer name* column, the layer names given by AutoCAD are listed. The *State* column shows, whether the elements of a layer will be displayed in a drawing (= ON) or not (= OFF). In a complex drawing switching off layers you don't want, considerably increases the redraw speed. When starting the miro3D-VIEWER the current layer state is taken from AutoCAD, when quitting the miro3D-VIEWER the layer state is given back to AutoCAD (*Take View* has to be switched on).

Control

ALL Layer on Select this option to display all layers on the screen.

ALL Layer off Select this option to display no layers on the screen.

Switching individual layers on/off

When double-clicking a layer name with the left mouse key, the corresponding layer is switched on/off.

Reset Layer This option restores the layer state that has originally been created in AutoCAD.

Layer Pattern All layers which match the input made in the *Layer Search Pattern* edit box are toggled on in the *Layer* column. Here you can enter wildcard characters (?, *, [], !), which can be combined freely. The names can contain upper and lower case characters.

Input	Meaning
*	...matches any number of characters
?	...matches any single character
[abc]	...matches the characters 'a', 'b' or 'c' in a string
[a - z]	...matches any character from 'a' to 'z' in a string
[a - fx]	...matches the characters from 'a' to 'f' and 'x' in a string
[0 - 9a - f]	...matches the characters from '0' to '9' and 'a' to 'f' in a string
[!abc]	...matches a character that is not 'a', 'b' or 'c'

Example:

Entering **?[abc]*[!y]** lists all layer names fulfilling the following conditions: The first character can be any character, the second character is an 'a', 'b', or 'c', then, a free number of characters follows, the last character is not a 'y'.

Light

This submenu allows to position and to fix a light source and to illuminate the backface of an object.

XYZ

The radio buttons in the X, Y, Z columns specify the rough direction of the light source.

Light Attributes

Fix light

This check box fixes the light source. The light does not rotate with the object but remains in its position. A camera move is more realistic when *Fix light* is turned off.

Backface Light

When this function is on, the back of the object is illuminated as well.

Default

When clicking the *Default* button, the light comes from the lower left front corner.

Displaylist

This sub-menu allows to load and delete the displaylist.

Synchronize DL

Here the AutoCAD data base is loaded. After quitting the miro3D-VIEWER the data is preserved. In addition, the layers switched on in AutoCAD are taken over by the miro3D-VIEWER.

Clean DL

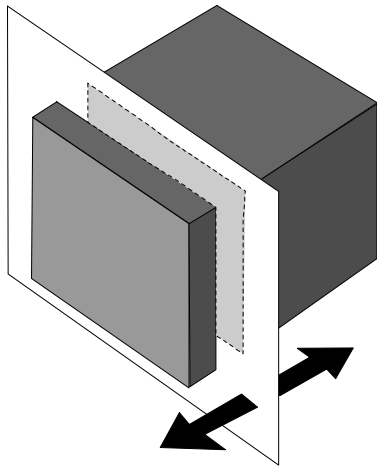
All 3D data in the display list is deleted, the memory is released.

Demo

By selecting this option a default drawing is loaded.

Clipping

The clipping function allows you to select and to move six clipping planes. The image information outside the planes can be cut off. In this way, it is possible to look at certain parts of the object.



Clipping

Plane

Here you can select the clipping planes where the object shall be cut. If the clipping function is disabled for one plane, the object is not cut at this side.

Visible

With a check box you can switch between visible and invisible clipping planes.

Transparency

Here you can specify the degree of transparency with which the clipping planes are to be shown.

All planes on/off

With this button all clipping planes can be activated/deactivated.

All visible/invisible

This button sets all clipping planes to be visible/invisible.

All 93.75 %/75 %/0 %

These buttons set the transparency for all clipping planes to 93.75 % (maximum transparency), to 75 % or to 0 % (no transparency).

Clipping

This check box enables the settings which have been set in the column *Plane*.





DOS tools

The package contents of your miro board includes DOS tools which help you to adjust and optimize the monitor image.

Windows and DOS tools

Call the DOS tools only in the MS-DOS mode, using the MS-DOS prompt under Windows does not work.

miroVGA2TV

miroVGA2TV allows you to connect a TV set to your computer and use it as a graphics display also under DOS. In this way, you can record the operation of DOS programs to video or you can play DOS games using the TV set (which is larger than the computer monitor in most cases). You can also select the graphics modes listed below.

Windows 95

To be able to install miroVGA2TV on the DOS level after having left Windows 95, select *Shut-down* in the *Start* menu and the *Restart the computer in MS DOS mode* option.

VGA2TV was copied to the Windows subdirectory \MIRO\COMMON during installation of the DOS tools.

Among others, this directory includes a README file containing the newest information on miroVGA2TV.

Using miroVGA2TV Configuring

After you start miroVGA2TV, all supported miroVGA2TV graphics modes are routed to the RCA socket of the connected TV set.

In most cases, miroVGA2TV does not have to be configured and works automatically. You can, however, make special settings using command line parameters.

Starting

To start miroVGA2TV, you have two options:

- ♦ Change to the directory to which you copied miroVGA2TV and enter **vga2tv <↵>** (PAL) oder **vga2tv /nn <↵>** (NTSC) to start the tool.
- ♦ Enter the PATH command in your AUTOEXEC.BAT file to be able to call miroVGA2TV from everywhere:
Path=%Path%;c:\vga2TV;
where **c:\vga2TV** is the drive and the directory to which you copied the VGA2TV files.

Command line parameters

When calling miroVGA2TV you can enter different options after the file name. If you call miroVGA2TV for the first time, the TSR is loaded into the memory and a part of the program stays resident (about 4k). If you call miroVGA2TV again, you can change some parameters. The following parameters are available:

General options:

/? Gives you brief help instructions.

/?? Gives you detailed help instructions.

/Q Messages do not appear on the screen
(except for error messages).

Options which are only available when loading miroVGA2TV (first call):

/N[P/N]

selects the video standard (P for PAL, N for NTSC). Without this parameter PAL is the default.

Options which are only available when loading miroVGA2TV (first call):

/U Removes miroVGA2TV from the memory.

/A Enables miroVGA2TV when it is in the memory but has been disabled with the \D parameter.

/D Disables resident miroVGA2TV. (This option makes it possible to switch miroVGA2TV off temporarily without removing it from the memory).

/M[<mode>[+/-]]

Use this option to switch the graphics modes supported by miroVGA2TV on/off. Without entering +/- the available modes and their present state are output.

/O[+/-]

Use this parameter to switch the *TVOnly* mode on/off. If the *TVOnly* mode is switched on, the VESA BIOS makes only modes available which are supported by miroVGA2TV.

/C[+/-]

This switch automatically distinguishes between video modes 13(320x200x8) and 13X(320x240x8). If this feature is disabled, the timing or the video mode 13X will not be adapted.

/F<special>[+/-]

Use this option to force some timing parameters (You should only use this option with together with the /C+ option). This option can be useful if the application changes the default video timing.

/FX Force alternative timing for modes 12 and 13

/FI Force interlaced timings

/FS Force default timings for modes 12 and 13

FT Enable continuous monitoring of registers

/FD Force delayed mode initialisation

/FL Mode locking

/FC Modified Line Compare for Interlaced images

Limitations miroVGA2TV supports the following graphics modes for the PAL and the NTSC video standards.

Mode	Resolution	Type	Default
1	40x25x4	Text	enabled
3	80x25x4	Text	disabled
D	320x200x4	Graphics	enabled
12	640x480x4	Graphics	enabled
13	320x200x	Graphics	enabled
13X	320x240x8	Graphics	enabled
100	640x400x8	Graphics	enabled
101	640x480x8	Graphics	enabled
10D	320x200x15	Graphics	enabled
10E	320x200x16	Graphics	enabled
10F	320x200x32	Graphics	enabled
110	640x480x15	Graphics	enabled
111	640x480x16	Graphics	enabled
112	640x480x32	Graphics	enabled

Windows 3.1x:

miroVGA2TV does not work under Windows 3.1x or in the Windows 3.1x DOS box. Please avoid starting Windows 3.1x while miroVGA2TV is active (remove the program entering [**vgatv -u**]).

Windows 95:

If you start your computer in MS-DOS mode and then start miroVGA2TV, the Windows desktop and the DOS boxes will also be displayed on the TV set.

Graphics modes larger than 640x480 pixels cannot be displayed completely on the TV screen and thus are not supported.

Graphics modes larger than 640x480 pixels cannot be displayed on the TV screen completely and are not supported.

miroVGA2TV does not work with programs, which cannot initialize the screen via the BIOS or which modify the graphics register afterwards. In this case the TV monitor shows no image.

miroTEST

CAD drivers under DOS, which do not allow you to select the resolution, can be configured using the miroMODE function of miroTEST. You can also view a test picture which helps you to adjust some image parameters. miroTEST will be copied to the \MIRO\COMMON directory during the installation and can be called up using additional suffix parameters.

miroMODE To get an overview over the possible parameters, change to the \MIRO\COMMON directory and enter **mirotest**<↵>. The options depend on the board/s you installed.

Example:

MIROMODE	MODE	XRES x YRES x BPP	H. frequ.	V. frequ.
0	-PC0	640 x 480 x 8	51.9 kHz	100.9 Hz
1	-HC0	640 x 480 x 15	51.9 kHz	100.9 Hz
2	-RC0	640 x 480 x 16	51.9 kHz	100.9 Hz
3	-TC0	640 x 480 x 24	51.9 kHz	100.9 Hz
4	-PC2	800 x 600 x 8	63.5 kHz	100.1 Hz
5	-HC2	800 x 600 x 15	63.5 kHz	100.1 Hz
6	-RC2	800 x 600 x 16	63.5 kHz	100.1 Hz
7	-TC2	800 x 600 x 24	46.9 kHz	75.0 Hz
8	-PC3	1024 x 768 x 8	60.0 kHz	75.0 Hz
9	-HC3	1024 x 768 x 15	60.0 kHz	75.0 Hz
10	-RC3	1024 x 768 x 16	60.0 kHz	75.0 Hz
11	-PC4	1152 x 864 x 8	67.8 kHz	75.0 Hz
12	-HC4	1152 x 864 x 15	67.8 kHz	75.0 Hz
13	-RC4	1152 x 864 x 16	67.8 kHz	75.0 Hz
14	-PC5	1280 x 1024 x 8	70.0 kHz	66.0 Hz
15	-PC6	1408 x 1024 x 8	70.0 kHz	66.0 Hz

Syntax:

To select a resolution, enter the following:

mirotest -miromode [mode1]<↵>

Options:

mode1 is the desired mode for board 1.

Example:

If your miro graphics system operates at a resolution of 640 x 480 with a color depth of 8 bit, enter: **mirotest -miromode 0<↵>**. When calling miroTEST again, the resolution you selected is marked as the current resolution.

Test picture

Maybe you want to or you have to change some parameters concerning the image geometry (e. g. image position or image size).

Call a test picture for this purpose. Enter:

mirotest [XRES][YRES][BPP]<↵>

XRES/YRES are the selected resolution modes, BPP is the bit depth (s. table above).

Ex.: **mirotest 1024 768**

(The 1024 x 768 resolution is selected; the default bit depth is 8);

mirotest 1024 16

(The 1024 x 768 resolution is selected; the default bit depth is 16).

Use the following keys:

<←>, <→>, <↑>, <↓>: change the image position,

<Ctrl> and <←>, <→>, <↑>, <↓>: change the image size,

<F3>: save settings,

: delete settings,

<Esc>, space bar: reject settings.



The horizontal frequency and the vertical scan rate only increase by making the image wider or higher.

You can enlarge the image until the maximum horizontal frequency of the monitor you selected has been reached. If you selected the right monitor, the maximum permissible horizontal frequency cannot be exceeded.

miroDETECT

miroDETECT is a DOS tool which offers a graphics board detection. If you need help from the miro support, you can use this tool to gather all information concerning your board.

miroDETECT is copied to the \MIRO\COMMON directory and is called by entering **detect** <↵>.

The following data appear on the screen (example: miroCRYSTAL 22SD twin in the dual-screen operation):

① miroCRYSTAL 22SD twin

② Booting CARD 1: ③ CARD0810.INI = miroTWIN 22SD (V) 20

④ Rev.4

⑤ RAM: 2

⑥ Graphics Controller: 765

① Non-boot CARD 2: ③ CARD0411.INI = miroCRYSTAL 22SD twin

④ Rev. 4

⑤ RAM: 2

⑥ Graphics Controller: 765

Explanation:

①: Board type

②: The PC boots on the base board (board 1)/board 2 is the daughterboard

③: Name of the initialization file

④: RAM on the graphics board

⑤: Graphics processor



Technical Data

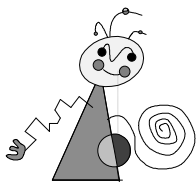
Bus system	PCI
Compatibility	VGA register-compatible
Graphics processor	S3 ViRGE/VX
Video memory	2 Mbyte EDO VRAMs 256 Kbit x 16 with 40 ns
Outputs	S-Video output, Composite output, 15-pin D-type video output
Power supply	+5 V, max. 1 A +12 V, max. 0.01 A
Video timings	Horizontal scan frequency: 31 kHz - 110 kHz, depending on operating mode Vertical scan frequency: 56 Hz - 100 Hz, non-interlaced, depending on operating mode Pixel frequency: 25 MHz - 220 MHz, depending on operating mode
TV timings	50 Hz PAL, 60 Hz NTSC, interlaced
Video modes	

Résolution	Bits par pixel	Fréquence de balayage d'image (Hz)										RAM [MO]	
		TV	35 kHz	48 kHz	58 kHz	64 kHz	78 kHz	85 kHz	93 kHz	100 kHz	107 kHz		
1600 x 1280	16	---	---	---	---	---	---	64	70	75	75	4	
1600 x 1280	8	---	---	---	---	---	---	64	70	75	75	4	2
1600 x 1200	16	---	---	---	---	---	---	68	75	80	80	4	
1600 x 1200	8	---	---	---	---	---	---	68	75	80	80	4	2
1408 x 1024	16	---	---	---	---	60	70	75	75	90	100	4	
1408 x 1024	8	---	---	---	---	60	70	75	75	90	100	4	2
1280 x 1024	24	---	---	---	---	60	70	75	75	75	75	4	
1280 x 1024	16	---	---	---	---	60	70	75	75	90	100	4	
1280 x 1024	8	---	---	---	---	60	70	75	75	90	100	4	2
1152 x 864	24	---	---	---	---	70	75	90	100	100	100	4	
1152 x 864	16	---	---	---	---	70	75	90	100	100	100	4	2
1152 x 864	8	---	---	---	---	70	75	90	100	100	100	4	2
1024 x 768	24	---	---	60	70	75	75	100	100	100	100	4	
1024 x 768	16	---	---	60	70	75	75	100	100	100	100	4	2
1024 x 768	8	---	---	60	70	75	75	100	100	100	100	4	2
800 x 600	24	---	56	75	75	100	100	100	100	100	100	4	2
800 x 600	16	---	56	75	75	100	100	100	100	100	100	4	2
800 x 600	8	---	56	75	75	100	100	100	100	100	100	4	2
704 x 576	24	X	---	---	---	---	---	---	---	---	---	4	2
704 x 576	16	X	---	---	---	---	---	---	---	---	---	4	2
704 x 576	8	X	---	---	---	---	---	---	---	---	---	4	2
640 x 480	24	X	60	75	100	100	100	100	100	100	100	4	2
640 x 480	16	X	60	75	100	100	100	100	100	100	100	4	2
640 x 480	8	X	60	75	100	100	100	100	100	100	100	4	2

„X“: TV Timings for an external TV encoder

Options miroCRYSTAL VR Upgrade kit, Monitor, shielded monitor cable

Other VESA DDC (DDC2B)

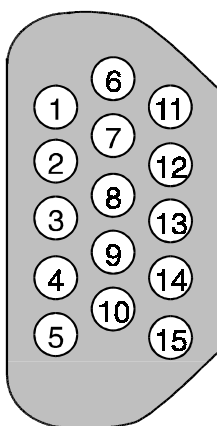


Appendix

15-PIN D-TYPE VIDEO PORT

The miroCRYSTAL 2000 / 4000 graphics boards are equipped with a 15-pin D-type connector to which the video cable attaches. The other end of the video cable connects to the monitor.

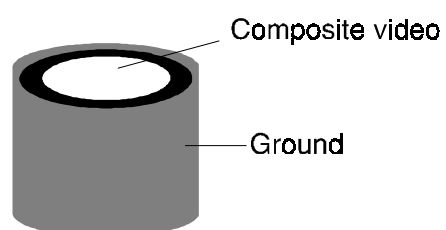
The following illustration and the table show the video output and the pin allocation of the video output, which is designed for data exchange with the monitor:



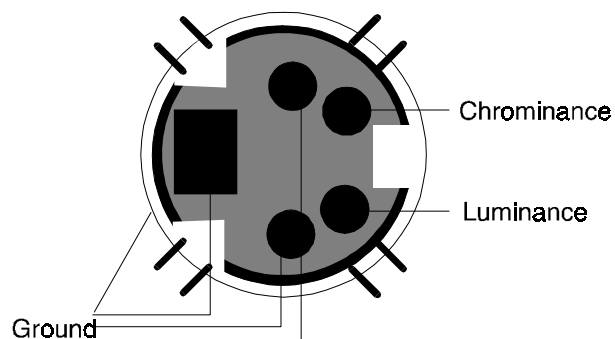
15-pin D-type connector

Pin No.	Pin Allocation
1	Red
2	Green
3	Blue
4	Free
5	Ground (analog)
6	Ground (red)
7	Ground (green)
8	Ground (blue)
9	+5V, 10 mA
10	Ground (sync.)
11	Free
12	DDC data
13	HSync
14	VSync
15	DDC clock

RCA JACK (TV-OUT)



S-VHS OUTPUT (S-VIDEO)



miroCRYSTAL VR 2000 / 4000 ADDRESS RANGE

For the miroCRYSTAL VR 2000 / 4000 graphics board to run without problems you have to avoid address conflicts. Make sure that the addresses used by miroCRYSTAL VR 2000 / 4000 are not also assigned to other components of your computer system.

I/O address range

The following table shows the I/O address areas that can be selected and used by miroMEDIA 3D.

I/O Address area (h)
3D4/3D5 or 3B4/3B5
3C4/3C5
3C0/3C1
3C6-3C9
3CE/3CF
3C2/3CC
3BA/3DA
3CA

In addition the I/O address 3C3 h is used.

Additional VGA addresses

In addition the following addresses are used:

VGA video memory	VGA BIOS
0A0000h - 0BFFFFh	0C0000h - 0C7FFFh

GLOSSARY

This glossary contains the most important concepts from the field of computer hardware, software and video. Cross-references are marked by this symbol .

- Address** All memory positions in a computer have numbers (addresses). Through these addresses each memory position can be addressed. Some addresses are reserved for certain  hardware components and must not be used. If two hardware components use the same address, there is an address conflict.
- ANSI** **American National Standards Institute.** ANSI character set ( Font): used by Microsoft Windows and Windows applications. The character assignation only differs slightly from the assignation of the  ASCII character set.
- ASCII** **American Standards Committee of Information Interchange.** ASCII character set ( Font): standard character set used by IBM and compatible computers. The ASCII character set consists of 256 characters, the first 128 of which are standardized.
- AUTOEXEC.BAT** A special DOS  batch file which is processed automatically after the computer has been started. The file contains among other things commands which load the country-specific keyboard driver ( Driver) or load programs automatically.
- AVI** Abbreviation for **Audio Video Interleaved**, standard format for digital video ( Video for Windows).
- Batch file** A  DOS file where a sequence of commands is processed one after the other.
- BIOS** **Basic Input Output System.** Number of basic input and output commands stored in a  ROM, PROM or EPROM. The  operating system uses these commands. The basic task of the BIOS is to control the data input and output. After starting the system the ROM BIOS performs some tests (checking the  interfaces, the disk drives, etc.).
- Bit** **Binary Digit.** Smallest information unit in a computer. One bit can take on two states: “0” and “1”, two bits can take on $2^2=4$ states and three bits $2^3=8$, etc. In a computer those states are realized by “0 V” (no current = 0) and “5 V” (current = 1). To display a character (letter, number etc.), 8 bits = 1  byte are required.
- Bus** In a computer, the bus provides for the communication between the  processor and the installed hardware (hard disk, graphics board, etc.). Depending on the bus width, the bus transfers a different amount of information. An 8-bit bus can transfer 8  bits (=  byte = one character) at a time.
- Byte** One byte consists of eight  bits. One byte represents exactly one character (letter, number etc.). The characters are binary-coded with “zero” (0) and “one” (1). The character “E” has the  ASCII code “01000101” or “45h” (hexadecimal).
- CD-I** A  CD-ROM standard designed for the field of entertainment which is independent of and not compatible with the conventional CD-ROM standard. Interactive components (e.g. for games) can only be played back with an original CD-I playback device.

CD-ROM	CD-ROMs are mass storage media for digital data, such as  digital video. CD-ROMs can only be read.
CGA	C olor G raphics A dapter (IBM). Graphics board which displays four colors in the graphics mode.
Clipping	Cutting off image information to make parts within an object visible.
Clock frequency	Rate at which individual commands are processed in a processor. The higher the  clock frequency, the quicker the commands are processed.
CLUT	C olor L ook U p T able. Color table which contains all indexed color values.
CODEC	Acronym for C ompressor/ D ecompressor, compresses (packs) and decompresses (unpacks) image data.
Color depth	Number of  bits containing color information for each  pixel. A color depth of 1 bit displays only black and white ($2^1=2$ colors). At a color depth of 8 bits $2^8=256$ colors are available and at 24 bits $2^{24}=16,777,216$ ( TrueColor) colors are available.
Composite video	Composite video encodes all image information in one signal.
CONFIG.SYS	A  DOS configuration file which is processed automatically when the system starts. The CONFIG.SYS file includes  drivers which control the output to the monitor and the keyboard and the mouse.
Data rate	Data per second, e.g. amount of data which a mass storage medium (hard disk or CD-ROM) saves/plays back per second or the amount of data of a video sequence per second.
DCI	Windows 3.1x features the DCI (D isplay C ontrol I nterface) which has been developed by Intel and Microsoft. DCI allows video software to directly access the graphics hardware and ensures a full-screen, jerk-free video playback. DCI needs at least the Video for Windows 1.1d version.
Digital video	Digital video stores information bit by bit in a file (in contrast to analog storage media).
DIP switch	D ual I nterline P ackage switch. A row of small switches designed to make certain hardware presettings.
Direct3D	A software interface developed by Microsoft for 3D games and other 3D applications under Windows 95. Enables Direct3D-capable applications to access 3D hardware efficiently.
DirectDraw	Software interface developed by Microsoft for Windows 95 which enables applications to access the graphics hardware.
DirectVideo	Successor of Video for Windows for Windows95. Has been expanded by Microsoft and will be designated by ActiveMovie in future.
DirectX	Direct (X) Extensions is a collection of several system extensions developed by Microsoft for Windows 95 (among others  DirectDraw,  Direct3D), to enable video and games acceleration.
Dithering	By using color patterns the number of the colors to be perceived by the eye is artificially increased. In this way, smoother color transitions are provided for the volume model.
DOS	D isk O perating S ystem. The most common  operating system for PCs (P ersonal C omputer). MS DOS is the M icrosoft version of DOS.
Driver	Programs which integrate the hardware (e.g. driver for a CD-ROM drive) in the computer and which adapt the software to the hardware (e.g. driver for a graphical user interface, such as Microsoft Windows). The software then

uses the features of the graphics board.

EDO-DRAM	E (xtended) D (ata) O (ut)-DRAM is a new, significantly faster variant of DRAM.
EGA	Enhanced Graphics Adapter (IBM), graphics board which displays 16 colors in the graphics mode.
EISA bus	Extended Industry Standard Architecture . 32-bit bus: The EISA bus can transfer an amount of data of 33 Mbyte per second at a clock frequency of 8.33 Mhz.
Fixed-frequency monitor	Monitor operating at a very small frequency range (multifrequency monitor).
Flat Shading	With this shading method all points of a polygon have only one color. The objects appear faceted.
Font	Character set in a certain type, size and style, e.g. Times New Roman 11, normal; Times New Roman 11, italics; Times New Roman 11, bold; Times New Roman 11, bold, italics.
Gouraud Shading	For each vertex of a polygon one color is used; the color for the pixels in between the vertices are interpolated resulting in smooth color transitions.
Graphics board	Graphics boards are the “link” between the computer and the monitor. Without a graphics board no image appears on the screen. Graphics boards operate in two modes: the text mode and the graphics mode. In the text mode only ASCII characters are displayed. The ASCII character set includes some simple “graphical” characters to display simple graphics. The graphics mode uses individual pixels. The more pixels available (the higher the resolution) the more detailed characters and graphics can be displayed.
Hardware	The hardware includes all computer components which are “hard”, such as the monitor, the hard disk, the keyboard, the mouse and the printer.
HGC	Hercules Graphics Card , monochrome (black and white) graphics board.
Hidden Lines	Displaying a 3D model as a surface model; only the lines which are covered are not shown.
Horizontal scan rate	Number of horizontal scans of the electron beam per second required to create a new line. The higher the resolution the higher the required horizontal scan rate.
Interface	Link between two parts of a system or between two systems where information, pulses and signals are adapted in a way that the receiving part can understand the sending part. For example, signals which the computer sends to the printer have to be adapted by an interface so that the printer “understands” what it has to print.
Interlaced	Image refreshing technique: the screen is subdivided into lines. When refreshing the image first all even lines and then all odd lines are refreshed.
ISA bus	International Standard Architecture . 16-bit bus which transfers 8 Mbyte of data per second at a clock frequency of 8 MHz.
Jumper	Jumpers can set up or interrupt electrical leads. To establish electrical leads with a jumper, the jumper has to be mounted, to interrupt the lead the jumper has to be removed.
KB	1 KB (Kilobyte) is equal to 1024 bytes. Here “K” (kilo) is always equal to “1024”.

Mbyte	1 Mbyte (Megabyte) equals 1024  KB.
MDA	Monochrome Display Adapter. Monochrome (black and white) graphics board.
MPEG	Abbreviation for Motion Pictures Experts Group. Standard for the compression of moving images.
Multifrequency monitor	A multifrequency monitor adapts itself automatically to different frequencies supplied by the graphics board ( fixed-frequency monitor) and can display different  resolutions.
Non-interlaced	Image refresh method, where the complete image is generated without skipping lines. A non-interlaced image flickers much less than an  interlaced image.
Operating system	The operating system provides for the communication between  hardware,  software and the user. The tasks of the operating system are among others the file and the program management.
Parallel interface	The parallel or Centronics  interface transfers data through an 8-bit data line. This means that 8  bits (1  byte) can be transferred at a time. The transfer through the parallel interface is considerably faster than the transfer through the  serial interface, over long distances the parallel data transfer is, however, more susceptible to interference. Parallel interfaces are designated by LPT and a number (e.g. LPT1).
Parallel Projection	With this type of representation the vanishing point for parallel edges of an object is located in the infinity.
PCI Local Bus	Peripheral Component Interconnect. Local Bus concept by Intel: 32-bit bus, a PCI bus can transfer 132 Mbyte per second (max.) at a  clock frequency of 33 Mhz.
Perspective Projection	With this type of representation parallel lines of an object meet at one point (vanishing point) in the distance. Objects near the viewer appear larger than objects of the same size that are farther away.
Pixel	Picture element. Pixels are the smallest elements of a monitor image ( resolution).
Pixel frequency	Rate at which the pixels appear on the screen.
Projection	Displaying an object of a higher dimension (e. g. three-dimensional) using a lower dimension (two dimensions).
RAM	Random Access Memory. A RAM is a read-write memory component from which data can be read and to which data can be written any time. The computer memory is equipped with RAM components. The memory is a so-called “volatile” memory meaning that the memory contents are removed as soon as the computer is switched off.
Refresh rate	Also vertical scan rate. Number of image refreshes per second measured in Hertz (Hz). The higher the vertical scan rate the less flicker.
Rendering	Calculating and displaying a realistic surface of a volume model.
Resolution	Number of  horizontal and vertical pixels. 1408 x 1024 means that 1408 pixels are displayed horizontally and 1024 pixels are displayed on the monitor vertically. The higher the resolution the more details the monitor can display.
RGB	Abbreviation for Red, Green and Blue, the basic colors of additive color mixing. RGB describes the method used in computer technology where image information is transferred by dividing it into the three basic colors.

ROM	Read Only Memory. A ROM is a memory component which can only be read but which cannot be modified. The ROM's contents remain in the component also after the computer has been switched off. All functions which have to be available immediately after switching the computer on, e.g. the data for the system test, the character output on the screen, etc. are stored in ROM components. There are also PROMs (P rogrammable R OM) EPROMs (Erasable P ROM) and EEPROMs (Electric E PROM).
Rotation	The objects rotates around an axis.
Scaling	Adaptation of an image to a different size.
Serial interface	Also RS232. The serial interface transfers data through a data line bit by bit (all 8 bits of a byte one after the other). The serial data transfer is considerably slower than the transfer through the parallel interface but it is less susceptible to interference. Serial interfaces are designated by COM and a number (e.g. COM1).
Shading	Transition from the wireframe representation to the volume representation.
Software	General term for all programs a computer can run (system programs, application programs, drivers etc.) and files.
S-Video	With S-Video signals the brightness (luminance) and the color information (chrominance) are transferred separately.
TrueColor	16.7 million colors can be displayed at a time (24 color depth).
Vertical scan rate	Refresh rate.
VESA	V ideo E lectronic S tandards A ssociation. Committee founded in 1988 in the USA which establishes common standards for the computer technology.
VESA Local Bus	Bus concept defined by the VESA committee: 32-bit bus operating at a clock frequency of up to 50 MHz. At a clock frequency of 33 MHz the VL bus transfers up to 132 Mbyte per second (max.).
VGA	V ideo G raphics A rray (IBM), graphics board which displays 256 colors in the graphics mode.
Video-CD	CD-ROM standard with MPEG videos you can play back using a CD-ROM drive and an MPEG decoder board.
Video decoder	Converts analog signals into digital information.
Video encoder	Converts digital information into analog signals.
Video for Windows	Video for Windows is a Microsoft Windows system extension which allows to record, to store and to play back video sequences from hard disk (digital video).
Volume Model	Surfaces are displayed with filled interiors.
Wireframe Model	Display of a three-dimensional object where only the edges are visible.
YUV	Color model where Y delivers the brightness information and U and V the color information.
Z-Buffer	This memory allows the 3D hardware to identify covered 3D objects more easily.

MONITOR SELECTION

The following instructions will help you to select the right monitor during the software installation.

**If you use a
miro monitor**

If you use a miro monitor, you will find the monitor name in the monitor selection list. For miro monitors, always the maximum vertical scan rate is selected (=100 Hz).

If you use a monitor that is listed twice, with the addition of *Microsoft* or *miro Computer Products AG*, choose the later of the two listings. This will ensure that the system uses the latest monitor timings.

**If you do not
use a miro
monitor**

If you do not use a miro monitor and therefore you do not find your monitor in the list, you can select a monitor from the monitor classes *xx kHz multifrequency monitor* or *xx kHz VESA multi frequency monitor*.

xx kHz multifrequency monitor:

Monitors belonging to this monitor class include timings with the maximum possible horizontal frequency and a maximum vertical scan rate of 100 Hz.

xx kHz VESA multi frequency monitor:

These monitors only include VESA-compatible timings which do not always use the monitor's capabilities to the fullest but which, however, offer the correct synchronization.

Select the VESA timings, if your monitor image is not synchronized correctly, the image position is wrong, etc.



Operating your monitor at a refresh rate which is too high may lead to serious damage. If you do not know which horizontal frequency your monitor supports, please refer to your monitor's documentation.



KONFORMITÄTSERKLÄRUNG DECLARATION OF CONFORMITY

Geräteart: Grafikkarte
Type of equipment: Graphics board

Produkt / Product : **miroCRYSTAL VR 2000**
miroCRYSTAL VR 4000

Das bezeichnete Produkt stimmt mit den Vorschriften folgender EU- Richtlinie(n) überein:
The aforementioned product complies with the following European Council Directive(s):

89/336/EWG Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die
elektromagnetische Verträglichkeit
Council Directive 89/336/EEC on the approximation of the laws of the Member States relating
to electromagnetic compatibility

Zur vollständigen Einhaltung dieser Richtlinie(n) wurden folgende Normen herangezogen:
To fully comply with this(these) Directive(s), the following standards have been used:

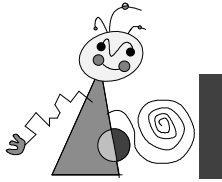
EN 55022:1987
EN 50082-1:1992

Dieser Erklärung liegt zugrunde: Prüfbericht(e) des EMV-Prüflabors
This certification is based on: Test report(s) generated by EMI-test laboratory

Aussteller / Holder of certificate : **miro Computer Products AG**
Carl-Miele-Str. 4
D - 38112 Braunschweig

Braunschweig, 18.07.1996
(Ort / Place) (Datum / Date)

.....
Siegfried Grabowski, Vorstand



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