

miroCRYSTAL 3D

USER'S GUIDE

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User's Guide

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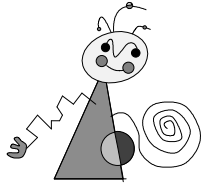
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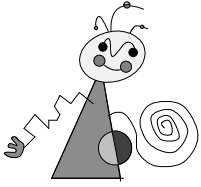
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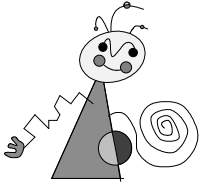
For your own safety

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.
- ♦ Avoid address conflicts!



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



About the manual

This manual explains how to install and use the miroCRYSTAL 3D 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 this “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.

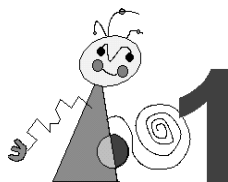
- Connect the miro board to the monitor.

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



The powerful miroCRYSTAL 3D graphics board has all capabilities regarding accelerated digital video playback.

☐ **Graphics acceleration**

The miroCRYSTAL 3D graphics board is equipped with the S3 TRIO64V+ graphics processor to improve the performance of applications running under Windows.

☐ **Multimedia acceleration**

For digital video applications a video processor is integrated in the graphics processor which enables an optimal playback of digital video. The processor can scale video continuously up to a size of 1024 x 768 pixels without producing jerky playback and losing frames.

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.

☐ **DCI**

Video for Windows 1.1e supports Microsoft's new DCI technology (**D**evice **C**ontrol **I**nterface). DCI allows the video software to directly access the miroCRYSTAL 3D hardware and to accelerate the image refresh considerably. The GDI (**G**raphics **D**evice **I**nterface), which has been responsible for the image refresh up to this time, is omitted.

☐ **Video memory**

The miroCRYSTAL 3D video memory allows you to work efficiently under Windows and in CAD applications. miroCRYSTAL 3D provides 2 MB of fast EDO-RAM version.

☐ **Drivers**

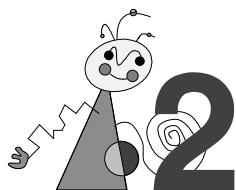
miroCRYSTAL 3D includes all of the necessary drivers to achieve the maximum performance from your system. In addition, the miro tools are provided.

☐ **Power Management**

miroCRYSTAL 3D supports VESA DPMS Power Management for today's monitors with Power Management. In this way, monitors can turn themselves off after a preset time interval to prolong their life and save energy.

☐ **Monitor plug & play support**

The miroCRYSTAL 3D graphics processor supports the VESA **D**isplay **D**ata **C**hannel (DDC). A monitor complying with this standard transmits its characteristics via this interface and starts up with an appropriate resolution.



Before you begin

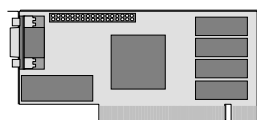
SYSTEM REQUIREMENTS

To install miroCRYSTAL 3D, your computer system has to meet the following requirements:

- Computer** A 486 or Pentium computer or compatible with a PCI Local Bus slot.
- Monitor** To be able to take full advantage of the miroCRYSTAL 3D board, you need a multifrequency monitor which supports a horizontal frequency of 64 kHz or more and is equipped with separate inputs for the horizontal and vertical sync signals. A suitable monitor can be obtained by miro.
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, or Windows NT.

PACKAGE CONTENTS

Before beginning the miroCRYSTAL 3D installation, please check to make sure your miroCRYSTAL 3D package is complete* :



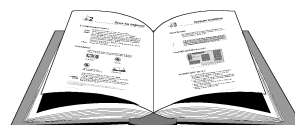
Graphics board**



CD-ROM



Driver, programs,
documentation on CD-ROM



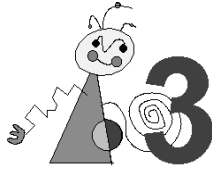
Quick installation guide

If any parts are missing, please consult your dealer. The complete software and documentation are contained on the CD-ROM: diskettes do not belong to the package contents.

- Installation disks** You can easily create installation disks using the miroSETUP-Manager included in the package contents. You can also download the disks using 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.



Hardware installation

INSTALLED VGA

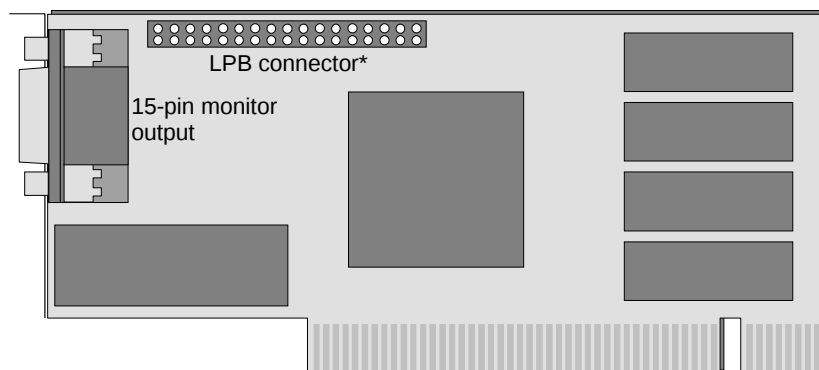


The board's graphics chip has an integrated VGA component that cannot be turned off. Before the installation, however, any existing VGA board or motherboard VGA has to be removed from the computer or disabled.



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.

miroCRYSTAL 3D BOARD LAYOUT



* The board layout may differ from the one illustrated here.

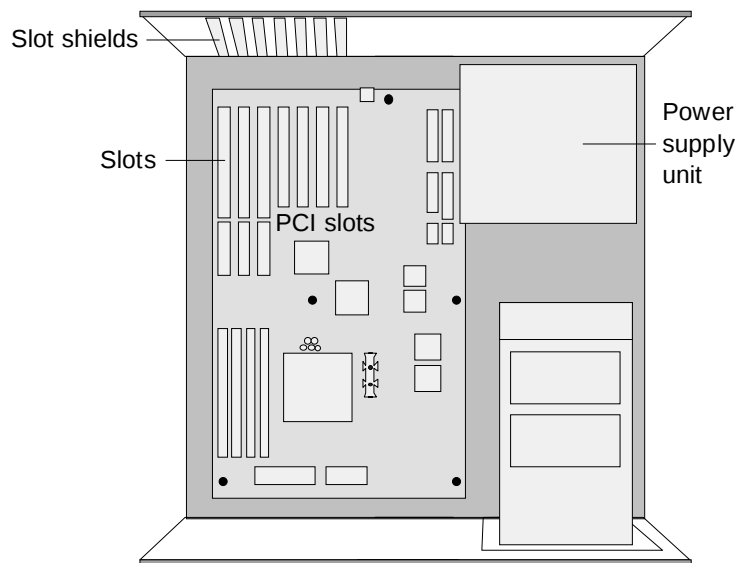
INSERTING miroCRYSTAL 3D



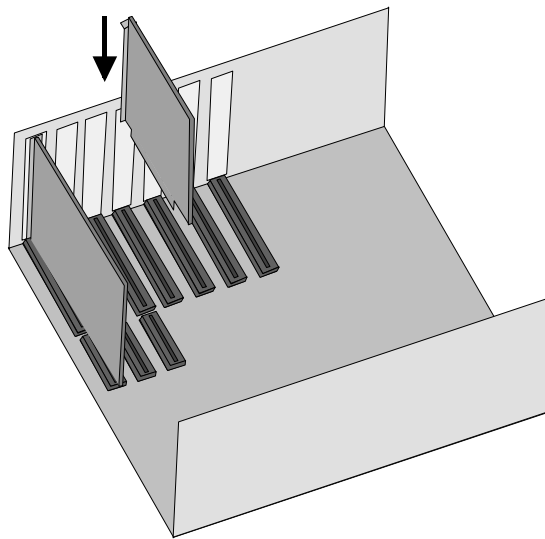
The only tool you need for the installation is a screwdriver.

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

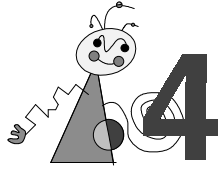


6. Carefully insert the graphics board into PCI slot by holding the board at the top and gently pushing both ends into the slot at the same time. Press onto the upper edge of the board to make sure it is firmly seated in the slot.



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.

7. Fasten the board's bracket at the back of the computer using the screws you saved from the shield.
8. Put the cover back on the computer and reconnect the peripheral devices.



Overview: Software installation

INSTALLING SOFTWARE FROM CD-ROM



miroSETUP- Manager

The CD-ROM includes drivers for Windows 3.1x, Windows 95, Windows NT, and the miroWINTOOLS.

For a description of the tools, refer to the miroWINTOOLS online help.

To install the miro drivers and programs from CD-ROM under Windows, you need the miroSETUP-Manager contained on the CD-ROM. If further installation programs are started during the installation, the miroSETUP-Manager will be minimized (Windows 3.1) or located in the task bar (Windows 95). To resize the miroSETUP-Manager double-click (Windows 3.1x) / click (Windows 95) the icon. After the installation is complete, restart Windows.

INSTALLING THE SOFTWARE FROM DISKETTE



Installation disk(s)

The CD-ROM includes drivers for Windows 3.1x, Windows 95, Windows NT, and the miroWINTOOLS.

You can easily create installation disks using the miroSETUP-Manager included in the package contents. You can also download the disks using the miro support mailbox.

Windows 95

The miro driver for Windows 95 can only be installed from the CD-ROM. There is **no possibility** to create installation disks for Windows 95.

Creating installation disk(s)

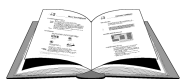
To create installation disks, you need a formatted 3,5" disk. Proceed as follows:

1. If you have not done so already, start Windows 95.
2. Insert the miro CD-ROM into the CD-ROM drive.
3. In the task bar, select the *Start* menu and the *Run...* command.
4. Depending on the CD-ROM drive you use, enter:
d:\miro_win<↵>, where **d:** is the drive letter of your CD-ROM drive.
5. Select the language you want to do the installation in and click *OK*.
6. In the *miroSETUP-Manager Module Selection* window, select the *Drivers and Programs* item.

In the *miroSETUP-Manager Drivers and Programs* window you can choose for which drivers and/or programs you want to create installation disks.

7. Select the driver you want to install and click *Disk(s)*.
8. Insert the required disk(s) into the disk drive: the installation disk(s) will be created.
9. If necessary, create further installation disks.
Use the *Quit* button to quit the miroSETUP-Manager.

READING AND PRINTING THE DOCUMENTATION



The *Documentation* menu item *miroSETUP-Manager Module Selection* lets you install the Adobe Acrobat Reader, you can use to view and print the complete documentation. For information on how to start the miroSETUP-Manager and to go to the *Module Selection* window, refer to the previous section “Creating installation disk(s)”.

When you clicked *Documentation* in the miroSETUP-Manager *Module Selection* and confirmed by clicking *Install...*, the Adobe Acrobat Reader installation program is started.

1. To install the Acrobat Reader, follow the instructions of the installation programs.

After restarting the computer, the Acrobat Reader program group will be available. This program group contains the Acrobat Reader program as well as the icons for the detailed documentation.

2. Double-click the icon to open the documentation you want to read.

Bookmarks

Selecting *View* and the *Bookmarks and Page* 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 the file, select the *Print...* command in the *File* menu and print the documentation.

Another language

If you want to view/print the documentation in another language, select the *File* menu and the *Open...* command. You will recognize the language by the extension: *_d* (German), *_e* (English), *_f* (French). You will find all files on the CD in the \MANUAL directory.

Other modules

If you want to install other modules after you have installed the Acrobat Reader, restart the miroSETUP-Manager.



Installing Windows 95 drivers



Before you can install the miro **drivers** for Windows 95, you have to configure your system for **VGA**. On how to do this, refer to the documentation of your system.

WINDOWS 95 DRIVERS (CD-ROM)

Alternatively to the installation procedure outlined in the following, you can also install the miro drivers using the *Display Properties* dialog box (Windows-like). This installation procedure is described in detail in the README file on the CD.



If you want to install the miroCRYSTAL 3D board under Windows 95 using the *Display Properties* dialog box, please read first the README file from the supplied CD-ROM.



To install the miro drivers and the miroWINTOOLS for Windows 95, 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.
3. In the task bar, select the *Start* menu and the *Run...* command.
4. Depending on the CD-ROM drive you use, enter:
d:\miro_win<↵>, where **d:** is the drive letter of your CD-ROM drive.
5. You are now in the *Language Selection* menu with the default setting *English*. The *Information...* button gives you information on the miroSETUP-Manager and its modules.

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

6. Click OK to go to the *miroSETUP-Manager Module Selection* window. Here you can select the *Drivers and Programs* item.

Information... The *Information...* button shows you all required instructions on the installation of the driver/program you selected.

Install... The *Install...* button starts the installation of the highlighted driver/program.

Diskette(s)... The *Diskette(s)...* button lets you create installation diskettes.

Microsoft DirectX

It is vital for the functionality of the miro drivers under Windows 95 that you installed the Microsoft **DirectX** driver. This contains all required software additions for the miro driver.



Before installing the graphics drivers for Windows 95, please install the Microsoft DirectX driver. For further information refer to the README file supplied on the CD.

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

miro drivers for Windows 95

The miro installation program

At the beginning of the installation program the *Language Selection* menu appears where you can first select the language. The default language is the language from the installed Windows 95 version.



1. Click *Next* to confirm.
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. Click on *Finish*. The *Setup Completed* dialog box appears. Click again 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. In the *Select model* window, choose *miroCRYSTAL 3D* and click *OK* to confirm.
Now, the drivers are being copied.
7. Choose a different monitor by clicking on *Change...* next to *Monitor*.
8. In the *Models* window, select your monitor. In the *Select model* window; select *Show all devices*, 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. Please also read the “Monitor selection” section, which you will find on page IV in the Appendix.

9. In the *Change Display Type* dialog box click *Close*.
10. Click *Apply* and answer *Yes* when being requested to restart the system.

miro WINTOOLS

During the installation of the miro drivers the miroWINTOOLS will be copied to your hard disk and the miroWINTOOLS program group will be created. The miroWINTOOLS offer a detailed online help.

Deinstallation

The miroWINTOOLS program group also offers an option which deinstalls the tools.

Further settings

After restarting Windows, go on to make the other settings (resolution, number of colors, etc.).

1. Open the *Display Properties* dialog box (click with the right mouse key on the Windows 95 desktop and the *Properties* menu item or the *Start* menu and *Settings*, *Control Panel*, *Display* and *Settings*).
2. In the *Settings* tab, change the desired settings (resolution, number of colors, ...).
If you selected a high resolution, it is recommended to select *Large Fonts*.
3. Click *OK* to accept the settings.
4. If you want the settings to take effect immediately, restart the system when Windows 95 requests you to do so.

WINDOWS 95 DRIVERS (HARD DISK)



You can also install the miro installation program for Windows 95 in 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 CD-ROM contents into this directory.
4. To start the miro installation program, you have different possibilities:
 - ♦ In the Windows 95 *Explorer* double-click the **SETUP . EXE** file in the directory you created.
 - ♦ Select *Run...* in the *Start* menu and enter the drive, the directory and the **setup** command:
e.g.: **c:\install\setup.**
 - ♦ Select the *Start* menu and the *Run ...* command and click on *Browse...*, then change to the drive and the directory where you find the copied files and double-click the **SETUP . EXE** file.

The miro installation program is started automatically.



For a detailed description of the miro installation program and of further settings, refer to the “The miro installation program” and “Further settings” sections (page 8) in the “Windows 95 drivers (CD-ROM)” section (as of page 7).

6

Installing Windows 3.1x drivers



Before beginning the miro software installation, make sure Video for Windows has been installed. If this is not the case, the installation program will notify you.

INSTALLING VIDEO FOR WINDOWS

To install Video for Windows, proceed as follows:

1. If you have not done so already, start Windows.
2. Insert the miro CD-ROM into the CD-ROM drive.
3. In the Program Manager, select the *File* menu and the *Run...* command.
4. Depending on the CD-ROM drive you use, enter:
d:\miro_win<,>, where **d:** is the drive letter of your CD-ROM drive.

You are now in the *Language Selection* menu with the default setting *English*. The *Information...* button gives you information on the miroSETUP-Manager and its modules.

5. Click *OK* to go to the *miroSETUP-Manager Module Selection* window.
6. In the *miroSETUP-Manager Module Selection* window select the *Drivers and Programs* item.
7. Enable the *Video for Windows* menu item and click *Install*.

Follow the instructions of the installation program.

Video for Windows is now being copied to your hard disk and the corresponding program group is created.

WINDOWS 3.1X DRIVERS (CD-ROM)



Before installing the miro **drivers** for Windows 3.1x, your system has to be configured for **VGA**. On information of how to install your system for VGA, refer to your system's documentation.



To install the miro drivers for Windows 3.1x and the miroWINTOOLS, proceed as follows:

1. If you have not done so already, start Windows.
2. Insert the miro CD-ROM into the CD-ROM drive.
3. In the Program Manager, select the *File* menu and the *Run...* command.

4. Depending on the CD-ROM drive you use, enter:
d:\miro_win<↵>, where **d:** is the drive letter of your CD-ROM drive.

You are now in the *Language Selection* menu with the default setting *English*. The *Information...* button gives you information on the miroSETUP-Manager and its modules.

5. Click *OK* to go to the *miroSETUP-Manager Module Selection* window. Here you can select the *Drivers and Programs* item and view and print the *Documentation*.

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

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

Now you are in the *miroSETUP-Manager Drivers and Programs* window. Here you can choose which drivers and/or programs you want to install.

Information... The *Information...* button shows you all required instructions on the installation of the driver/program you selected.

Install... The *Install...* button starts the installation of the highlighted driver/program.

Diskette(s)... The *Diskette(s)...* button lets you create installation diskettes.

7. Enable the *Driver for Windows 3.1x* menu item and click *Install...* .
The miro installation program is automatically started.

The miro installation program

At the beginning of the installation program the *Language Selection* menu appears with the default setting *English*.

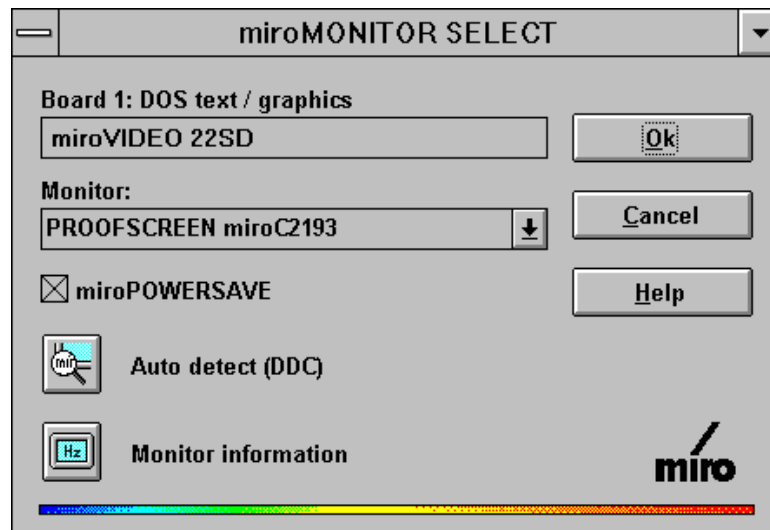
8. Click *Install*.

9. Select the components you want to install.

After the installation is complete, the miroMONITOR SELECT tool will be started you can use to select your monitor.

miroMONITOR SELECT (Windows)

The miroMONITOR SELECT window lets you select your monitor.



Board 1: DOS text/graphics

Here the installed graphics board is displayed.

Monitor:

miroCRYSTAL 3D supports VESA Display Data Channel (DDC). If your monitor also supports the DDC specification, you will find your monitor in the *Monitor* list box during a first-time installation.

If this is not the case or if there is a wrong entry in the *Monitor* list box, proceed as follows:

- Open the *Monitor* list box and select your monitor. If your monitor is not named in the list, select the monitor with the next lower horizontal frequency.



An incorrect selection can seriously damage your monitor. If you are in doubt, refer to your monitor documentation.

miroPOWERSAVE:

miroCRYSTAL 3D supports VESA DPMS Power Management. A monitor which also supports Power Management reduces its power consumption when it is not being used until it switches itself off.

- Enable the *miroPOWERSAVE* check box, if your monitor supports this tool.



Only use *miroPOWERSAVE*, if your monitor has a power saving function complying with the VESA specification!



Auto detect:

If you click this button and if your monitor supports the VESA DDC standard, miroCRYSTAL 3D tries to detect the monitor connected to the board.



Monitor information:

If you click this button, you get a list with all resolutions and frequencies available.

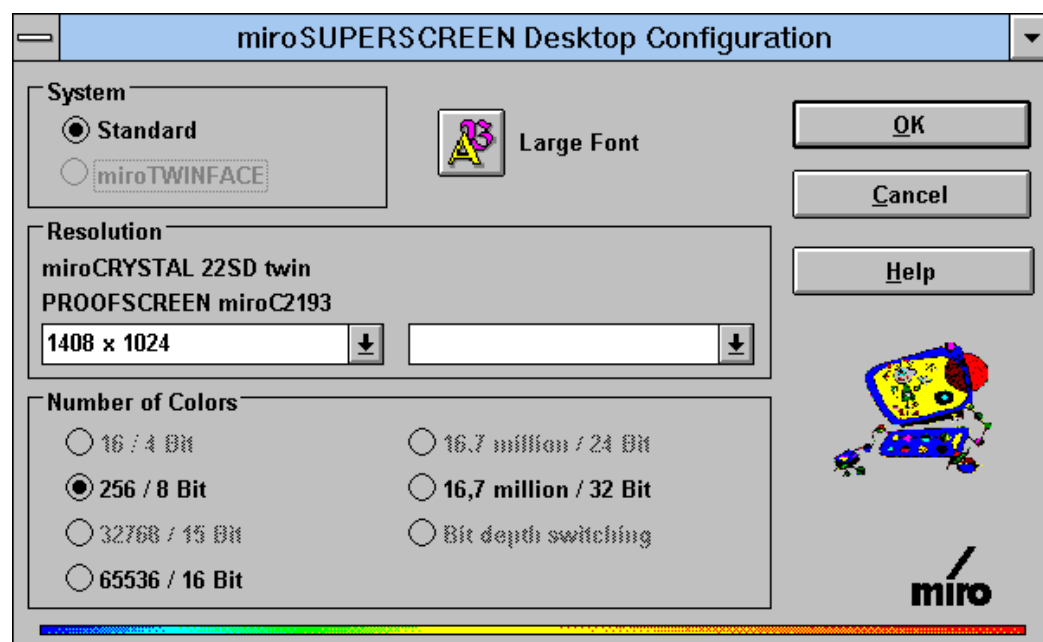
For detailed information on miroPOWERSAVE, refer to the online help.

- Click **OK**, to accept the settings.

The miroSUPERSCREEN tool starts automatically.

miroSUPERSCREEN

A detailed online help gives you detailed information on **all** miroSUPERSCREEN functions.



- The *Large Font* button lets you select large fonts. The *Large Font* setting is recommended if you use high resolutions.
- Select the correct resolution in the *Resolution* list box.
- Select the desired *Number of colors*. Color depths which cannot be selected are dimmed. If you enabled the *Bit depth switching* option, use the button in the miroPINBOARD.
If you want to change the resolution and the number of colors, always select the resolution and then the number of colors.
- After you specified all resolutions, click **OK** to quit miroSUPERSCREEN and start Windows.

miroWINTOOLS

During the installation of the miro drivers the miroWINTOOLS have been copied to your hard disk and the program group has been created.

A detailed online help gives you more information on the miroWINTOOLS.

WINDOWS 3.1X DRIVERS (DISKETTE)



If you created installation disks for Windows 3.1x using the miroSETUP-Manager, you can install the installation from disk. On information on how to create installation disks, refer to “Overview: Software installation” section in the “Creating installation diskette(s)” as of page 5.

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

1. Start Windows.
2. Insert the first disk from the installation disk set into the disk drive.
3. In the Program Manager, select the *File* item and the *Run...* command.
4. Depending on the disk drive you use, enter:
a:install or **b:install** and click *OK*.

The miro installation program is started automatically.



For a detailed description, refer to the “Windows 3.1x drivers (CD-ROM)” chapter in the “The miro installation program” section as of page 12.



Installing Windows NT drivers

WINDOWS NT 3.5X (DISKETTE)



The CD-ROM also includes drivers for Windows NT. These cannot be installed using the miroSETUP-Manager.

Create installation disks using the miroSETUP-Manager. On how to create installation disks, refer to “Creating installation disk(s)” in the “Overview: Software installation” section page 5.

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

To install the miro drivers for Windows NT,

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 18) and then select a resolution (page 18).

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. Only Windows NT 3.5: 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 the system immediately clicking *Restart Now*. You can also click the *Don't Restart Now* button to get back to the *Control Panel* program.
7. Restart the system using the task bar.
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 RESOLUTION

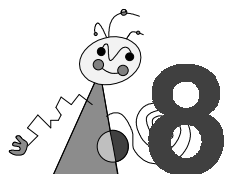
To change the resolution, proceed as follows:

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. Change to *Settings*.
3. The *List All Modes* button lists the resolutions your board and your monitor support and the number of colors 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 colored 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*.

Windows NT 3.5x 7. Restart the system.

Windows NT 4.0 7. The new graphics mode will be displayed immediately.



Technical data

Bus system	PCI
Compatibility	VGA register-compatible
Graphics processor	S3 ViRGE
Video memory	2 MB EDO (Extended Data Out)
Power supply	+5 V, max. 1 A +12 V, max. 0.01 A

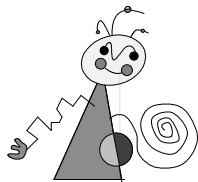
Video modes

Resolution	Bit/Pixel	Maximale Bildwiederholfrequenzen						
		TV	64 kHz	78 kHz	85 kHz	93 kHz	100 kHz	107 kHz
1408 x 1024	8	-	60 Hz	70 Hz	70 Hz	70 Hz	70 Hz	70 Hz
1280 x 1024	8	-	60 Hz	70 Hz	75 Hz	75 Hz	75 Hz	75 Hz
1152 x 864	16	-	70 Hz	75 Hz	75 Hz	75 Hz	75 Hz	75 Hz
1152 x 864	8	-	70 Hz	75 Hz	90 Hz	90 Hz	90 Hz	90 Hz
1024 x 768	16	-	75 Hz	75 Hz	75 Hz	75 Hz	75 Hz	75 Hz
1024 x 768	8	-	75 Hz	75 Hz	100 Hz	100 Hz	100 Hz	100 Hz
800 x 600	24	-	75 Hz	75 Hz	75 Hz	75 Hz	75 Hz	75 Hz
800 x 600	16	-	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
800 x 600	8	-	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
768 x 576	24	x	-	-	-	-	-	-
640 x 480	24	x	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
640 x 480	16	x	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
640 x 480	8	x	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz

Video Timing	♦ Horizontal frequency: 31 kHz to 83 kHz, depending on the operation mode ♦ image refresh rate: 60 Hz to 100 Hz, non-interlaced, ♦ pixel frequency: 25 MHz to 135 MHz, depending on the operation mode
---------------------	--

Options Monitor, shielded monitor cable, upgrade kit

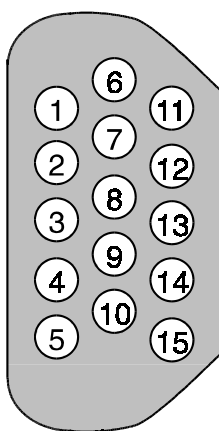
Other Vesa DDC



15-PIN D-TYPE VIDEO PORT

The miroCRYSTAL 3D 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 corresponding pin allocation:



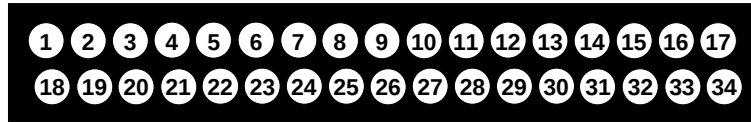
15-pin D-type connector

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	Free
10	Ground (sync.)
11	Free
12	Free
13	HSync
14	VSynC
15	Free

LPB FEATURE CONNECTOR

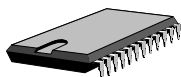
The miroCRYSTAL 3D graphics boards can be used together with a video overlay board. For this purpose you need the LPB feature connector.

The following table provides a pin allocation overview.



Pin No.	Pin Allocation
1	Pixel data P0
2	Pixel data P1
3	Pixel data P2
4	Pixel data P3
5	Pixel data P4
6	Pixel data P5
7	Pixel data P6
8	Pixel data P7
9	Clock
10	Reserved
11	HSync
12	VSynC
13	Ground
14	Ground
15	Ground
16	Ground
17	Enabling signal
18	Enabling signal
19	Enabling signal
20	Free
21	Ground
22	Ground
23	Ground
24	Ground
25	Free
26	Free
27	Free
28	Free
29	I ² C clock
30	Ground
31	I ² C Data
32	Free
33	Select 0
34	Select 1

miroCRYSTAL 3D ADDRESS RANGE



For the miroCRYSTAL 3D graphics board to run without problems you have to avoid address conflicts. Make sure that the addresses used by miroCRYSTAL 3D 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 miroCRYSTAL 3D.

0E2E8h	
042E8h	04AE8h
082E8h	08AE8h
092E8h	09AE8h
0A2E8h	0AAE8h
0B2E8h	0BAE8h
046E8h	04EE8h
086E8h	08EE8h
096E8h	09EE8h
0A6E8h	0AEE8h
0B6E8h	0BEE8h

Additional VGA addresses

In addition the following addresses are used:

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

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.

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), set the time or load programs automatically.

AVI Abbreviation for **A**udio **V**ideo **I**nterleaved, 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 **B**asic **I**nterface **O**utput **S**ystem. 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 **B**inary **D**igit. 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, busses provide 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).

CGA **C**olor **G**raphics **A**dapter (IBM). Graphics board which displays four colors in the graphics mode.

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.
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.
Digital video	Digital video stores information bit by bit in a file (in contrast to analog storage media).
DIP switch	D ual I ndline P ackage switch. A row of small switches designed to make certain hardware presettings.
Dithering	Method to avoid extreme color contrasts, which occur with a reduced number of colors.
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.
EGA	E nhanced G raphics A dapter (IBM), graphics board which displays 16 colors in the graphics mode.
EISA bus	E xtended I ndustry S tandard A rchitecture. 32-bit bus: The EISA bus can transfer an amount of data of 33  MB per second at a  clock frequency of 8.33 Mhz.
Fixed-frequency monitor	Monitor operating at a very small frequency range ( multifrequency monitor).
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.
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 are 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	H ercules G raphics C ard, monochrome (black and white) graphics board.
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 MB 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”.
MB	1 MB (Megabyte) equals 1024 KB.
MDA	Monochrome Display Adapter. Monochrome (black and white) graphics board.
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).
PCI Local Bus	Peripheral Component Interconnect. Local Bus concept by Intel: 32-bit bus, a PCI bus can transfer 132 MB per second (max.) at a clock frequency of 33 MHz.
Pixel	Picture element. Pixels are the smallest elements of a monitor image (resolution).
Pixel frequency	Rate at which the pixels appear on the screen.
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.
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 **R**ed, **G**reen and **B**lue, 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 **R**ead **O**nly **M**emory. 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 (**E**rasable **P**ROM) and EEPROMs (**E**lectric **E**PROM).

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 8 parallel interface but it is less susceptible to interference. Serial interfaces are designated by COM and a number (e.g. COM1).

Software General term for all programs a computer can run (system programs, application programs, drivers etc.) and files.

TrueColor 16.7 million colors can be displayed at a time (24 color depth).

Vertical scan rate Refresh rate.

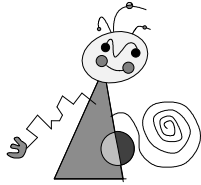
VESA **V**ideo **E**lectronic **S**tandards **A**ssociation. Committee founded in 1988 in the USA which establishes common standards for the computer technology.

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 MB per second (max.).

VGA **V**ideo **G**raphics **A**rray (IBM), graphics board which displays 256 colors in the graphics mode.

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).

YUV Color model where **Y** delivers the brightness information and **U** and **V** the color information.



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:

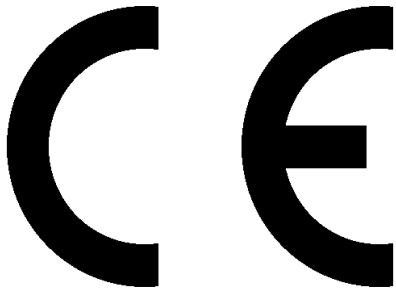
- ♦ Reorient or relocate the receiving antenna.
- ♦ Increase the separation between the equipment and receiver.
- ♦ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ♦ Consult the dealer or an experienced radio/TV technician for help.

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.



KONFORMITÄTSERKLÄRUNG DECLARATION OF CONFORMITY

Geräteart: Grafik-Board
Type of equipment: Graphics board

Produkt / Product : **miroCRYSTAL 3D**

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

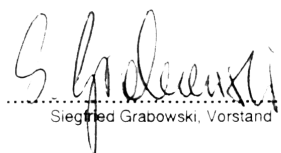
Zur vollständigen Einhaltung dieser Richtlinie(n) wurden folgende Normen herangezogen:
To fully comply with this(these) Directive(s), the following standards have been used:

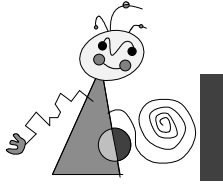
EN 55022 Class B: 1987
EN 50082-1: 1992 (ICE 801-2,-4 / ENV50140 / ENV 50141)

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, 14.08.1996
(Ort / Place) (Datum / Date)


.....
Siegfried Grabowski, Vorstand



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