

miroCRYSTAL DIP20/miroCRYSTAL DIP40

User's Guide

miroCRYSTAL DIP20 **miroCRYSTAL DIP40**

User's Guide





miroCRYSTAL DIP20/DIP40

User's Guide

Version 1.0/E. July 1995

VDOK-DIP2-100

© miro Computer Products AG 1995

All rights reserved.

No part of this manual may be reproduced or transferred to other media without explicit written permission from miro Computer Products AG, Braunschweig, Germany.

IBM AT® is a trademark of International Business Machines Corp., VGA™ is a trademark of International Business Machines Corp.

miro™ is a trademark of miro Computer Products AG.

Pentium™ is a trademark of Intel Corp.

Windows™ and Windows for Workgroups™ are trademarks of Microsoft Corp.

VESA™ is a trademark of Video Electronics Standards Association.

PCI® and PCI Local Bus® are registered trademarks of PCI Special Interest Group.

miro Computer Products AG has written this manual to the best of its knowledge, but does not guarantee that the programs/systems will fulfill the desires of the user.

No warranty is made as to the specifications of features.

miro retains the right to make alterations to the content of the manual without the obligation to inform third parties.

All tenders, sales, supply and manufacturing contracts from miro, including consultancy, installation and other contractual performance are subject exclusively to the General Sales and Delivery Terms of miro.

Contents

For your own safety	ii
About the manual	iii
Quick installation chart	iv

1. Overview 1

Features	1
System requirements	2
Package contents	2

2. Installation 3

Installing hardware	3
Installing miro software	4
General	4
Installation	4
miroMONITOR SELECT	5
miroSUPERSCREEN	6
miroSCALE-Control	6
miroCOLOR2GRAY	8
miroZOOM-Hotkey	9

3. Technical data 10

15-pin D-type video port	I
VESA Standard Feature Connector	II
miroCRYSTAL address range	III
Glossary	VI

Index

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 such as graphics boards 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.
- Only use a shielded cable to connect the monitor to the computer.
- For the monitor identification via Data Display Channel: Only use a monitor cable which loops all signals through completely.
- Do not use a cable which connects to the power supply of the computer.
- Make sure that your graphics board is **in compliance with the slot**.



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

About the manual

This manual explains how to install the miroCRYSTAL DIP20/DIP40 board in your computer.

The quick installation chart overleaf provides an overview for the hardware and software installation. To ensure the correct installation and correct jumper settings, read the detailed explanations in this manual.

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



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

Bullets mark step by step instructions:

- Insert the graphics board into the slot.

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*.

Quick installation chart

The following installation chart gives you an overview over the hardware and software installation.

Hardware

1. Check the system requirements, make backup copies of the supplied installation disks.
2. Open the computer.
3. Insert the graphics board in the PCI slot.
4. Connect the monitor.

Software

5. Install miro software (Windows drivers, miroWINTOOLS) for miroCRYSTAL DIP20/40:

You need the miro•win disk.

Insert the *miro•win High speed drivers for Windows; Install disk # 1/1*.

In the Windows Program Manager, select the *Run* command in the *File* menu.

Depending on the disk drive you use, enter **a:install** or **b:install**.

Follow the instructions of the installation program.

1. Overview

Features

miroCRYSTAL DIP20/40 are graphics boards developed by miro especially for the professional use in the **Document Image Processing (DIP)** area. For all Windows applications the highest performance and efficiency are achieved.

The miroCRYSTAL graphics boards offer the following features:

q Graphics acceleration

The miroCRYSTAL graphics boards are equipped with S3 64-bit-graphics processors which are especially suited for accelerating applications under Windows.

q Video memory/resolutions

miroCRYSTAL DIP20 has 2 Mbytes VRAM and offers a maximum resolution of 1600 x 1280 with 256 colors. miroCRYSTAL DIP40 has 4 Mbytes VRAM and offers a maximum resolution of 1600 x 1280 in Hi-Color (65,536 colors).

q Drivers and imaging tools

Powerful drivers accelerate the grayscale and the zoom function. Tools which are especially suited for imaging applications facilitate work routines.

q miro monitors

miro offers an ideal combination which consists of a miroCRYSTAL DIP graphics board and a suitable monitor fulfilling all demands which are essential for the Document Image Processing area (ergonomics, high image refresh rates, sharp focus, precise convergence).

q Monitor plug & play support

The miroCRYSTAL DIP board supports the VESA **Display Data Channel (DDC)**. A monitor complying with this standard transmits its characteristics via this interface and starts up with an appropriate resolution.

System requirements

To install the graphics boards, your system has to meet the following requirements:

Computer	486, Pentium PC or compatible computer with a PCI Local Bus slot.
Monitor	High-resolution multifrequency monitor with a max. horizontal scan frequency of 64 kHz or higher. A suitable monitor can be obtained by miro.
Software	Windows 3.1 or higher; <i>recommended:</i> Windows for Workgroups 3.11 or higher

Package contents

Before installing the miro graphics board make sure that your system is complete:*

- graphics board**,
- installation diskette with
 - miro Windows drivers
 - miroWINTOOLS
 - miroDIPTOOLS,
- documentation,
- *optional*
monitor, shielded monitor cable.

If any parts are missing, please consult your reseller.



Graphics boards are very sensitive to electrostatic charge. To avoid damages caused by electrostatic charge, leave the board in its antistatic bag until you install it. Keep the packaging for future transports.

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

** For the exact model name and the serial number, refer to the label on the graphics board.

2. Installation

Installing hardware

Existing 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:

- Turn off your computer and all peripheral devices. Disconnect the computer from the power supply and all necessary components.
- Loosen the screws of the computer's cover and remove it.
- Discharge yourself of static charge by touching the power unit casing.
- Remove an existing VGA board from the computer or disable a motherboard VGA.
- Select a free PCI slot. Remove the slot's cover at the back of the computer. Save the screws of the cover.
- Carefully insert the graphics board into the 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.

- Fasten the board's bracket at the back of the computer using the screws you saved from the shield.
- Put the cover back on the computer and reconnect the peripheral devices.
- Connect the monitor with the 15-pin D-type socket. If you are in doubt about how to connect your monitor, please refer to the documentation that came with your monitor.
- Reconnect the computer and the monitor to the power supply.

How to go on?

After having installed your graphics board, you can install the miroCRYSTAL DIP system software, the miro drivers and tools and select your monitor.

Installing miro software

General

Requirements

To install the software correctly, **Windows** has to be installed for **VGA**. In addition, you need 3 Mbytes memory.



Before beginning with the installation, make backup copies of the supplied installation diskette(s) using the DOS **DISKCOPY** command. Keep the original diskettes in a safe place and only use the copies.

miroWIN-TOOLS

The miro•win diskette includes the miroWINTOOLS which can be copied to the hard disk during the installation.

The miroWINTOOLS offer a range of functions to adapt your Windows desktop to your liking.

For detailed information on the miroWINTOOLS refer to your miro•win Software Manual.



In the miroWINTOOLS program group you find the *Information* icon. Click this icon, to view the latest information.

miroDIP-TOOLS

The miro•win diskette also includes tools which have been especially designed for imaging applications: the miroDIPTOOLS.

A detailed description of miroSCALE-Control, miroCOLOR2GRAY and miroZOOM-Hotkey is included in this manual.

Installation

You always have to install the miro software from the diskette.

Result of the installation

The required files will be copied to your hard disk into the Windows directory and, if possible, to the Windows system directory.

The miroWINTOOLS will be located in the *miroWINTOOLS* program group, the miroDIPTOOLS in the *miroDIPTOOLS* program group.

If you only install the Windows drivers, only the miro tools miroMONITOR SELECT, miroSUPERSCREEN and miroPOWERSAVE are located in the miroWINTOOLS program group. These tools can be started any time after the installation.

The installation program modifies the WIN.INI, SYSTEM.INI and CONTROL.INI Windows files.

Installing



- Start Windows.
- Insert the *miro•win High speed drivers for Windows 1/1* diskette into the diskette drive.
- In the Program Manager select the *File* menu and the *Run...* command.
- Depending on your diskette drive enter:
a:install or **b:install**
and click *OK*.

After starting the installation program the *Language Selection* menu appears in English (default setting).

OK/Cancel

Click *OK* to go on with the installation program and *Cancel* to exit the program.

- Select the items you want to install.
 - *Basic software* and/or
 - *miroDIPTOOLS*
 - *miroWINTOOLS* (*miroTINT CONTROL*, *miroSIZE CALIBRATION*, *miroSCOPE*, *miroPINBOARD*, *miroSCREEN-Adjust*) and/or
 - *miroWALL-Paper*
- Click *Install* to go on with the installation.

If you **only** installed the **miroWINTOOLS**, the installation ends after the files have been copied. To exit the installation program, click *OK*. You are now in the Windows Program Manager.

After having completed the miro Windows drivers installation the *miroMONITOR SELECT* tool is started.

miroMONITOR SELECT

miroMONITOR SELECT allows to select your monitor.

Under *Hardware* you see the installed graphics board.

miroCRYSTAL DIP supports **VESA Display Data Channel (DDC)**. If your monitor also supports the DDC specification, data can be transferred between monitor and graphics board.

Monitor

If your monitor supports DDC, 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.



miroPO- WERSAVE

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

miroCRYSTAL DIP 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.

- Activate *miroPOWERSAVE*, if your monitor supports this tool.



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

For detailed information on *miroPOWERSAVE*, refer to the *miro•win* Software Manual.

Auto detect



If you click this button and if your monitor supports the VESA DDC standard, *miroCRYSTAL DIP* tries to detect the monitor connected to the board. A message will appear informing you whether a monitor could be detected or not.

Monitor information



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

Click *OK*, to accept the settings. The *miroSUPERSCREEN* tool starts automatically.

miroSUPERSCREEN

For detailed information on **all** *miroSUPERSCREEN* functions, refer to the *miro•win* Software Manual.

- Specify the resolution, the number of colors, and the font size.
- After you specified all settings, click *OK* to quit *miroSUPERSCREEN* and restart Windows.

miroSCALE-Control

miroSCALE-Control forms part of the *miroDIPTOOLS*. During the *miro* installation *miroSCALE-Control* has been copied into the *miroDIPTOOLS* program group and into the StartUp group.

This tool optimizes the Windows desktop for applications which run at high resolutions where icons, titles, and fonts are hardly recognizable. *miroSCALE-Control* allows you to change the size of the displayed objects on the Windows desktop (mouse pointer, icons and fonts) and the spacing between the icons.



To start miroSCALE-Control, double-click the program icon. The miroSCALE-Control dialog window appears:



The window is divided into the *Cursor* and the *Icon* group.

Cursor

Size

Use the slider to set the cursor size.

You have a choice of three sizes: Small, Medium and Large.

For low resolutions a small cursor is ideal, a large cursor size is suitable for large resolutions.

The preview window (upper part of the dialog window) shows you the result of the setting.

Frame Color

This list box lets you select the color for the mouse cursor.

Color

This list box lets you select the color filling the mouse cursor.

The settings in the *Cursor* group take effect immediately.

Icon

Spacing

Use the slider to set the spacing between the icons.

The preview window (upper part of the dialog window) shows you the result of the setting.

Title

The list box lets you change the size and the of the letters on the icons. You can choose between three sizes: Small, Medium and Large.

Size

Here you can change the size of the icons. Two sizes are available.

The settings you make in the *Icon* group take only effect after Windows has been restarted.

Apply

This button accepts the new desktop configuration. Some settings take effect after Windows is restarted. In this case a message will notify you.

Cancel

This button quits miroSCALE-Control, the settings are rejected.

Default

This button selects the default values:

- Cursor size *small*
- Cursor frame color *black*; Cursor color *white*
- Spacing between icons *90 pixels*
- Labelling of icons *small*
- Icon size *default*

miroCOLOR2GRAY

miroCOLOR2GRAY is a part of the miroDIPTOOLS. During the miro installation the tool has been copied to the miroDIPTOOLS program tools.

miroCOLOR2GRAY is a tool which allows you to define grayscale to be displayed on a black-and-white monitor. Grayscales are assigned to the Windows colors so the Windows desktop will be organized clearly although only in grayscales.



To start miroCOLOR2GRAY, double-click the program icon. The dialog window appears:



Grayscale

You can select a display with one (black-and-white), 16, or 256 grayscales.

RGB

You can use the RGB sliders to select the basic colors red, green and blue and the gray values. Beside the miro logo the color portion of each color channel appears under *Ratio* in %.

Apply

This button accepts the current settings. miroCOLOR2GRAY remains open, the program window is reduced to an icon and is located at the bottom of the screen.

Cancel

Click this button to leave miroCOLOR2GRAY-Control.

The last gray value which has been saved is accepted, miroCOLOR2GRAY remains open, the program window is reduced to an icon and is located at the bottom of the screen.

Default

Clicking this button selects the default values which are used for black-and-white TV.

Close

Click this button to close the tools. Before the tool is closed you are requested if you want to store the current settings. You can also close miroCOLOR2GRAY by opening the system menu (small bar in the upper left corner of the window) and selecting *Close*.

miroZOOM-Hotkey

miroZOOM-Hotkey is a part of the miroDIPTOOLS. During the miro installation the tool has been copied to the miroDIPTOOLS program group. The zoom function allows you to use a hotkey to enlarge or to make document details smaller.



To start miroZOOM-Hotkey, double-click the program icon. The following dialog window appears:

**Zoom In hotkey**

Here you can select a hotkey for the zoom function. You can choose between several hotkeys. After you have selected a hotkey, you can use it to zoom in a document.

If you press a key combination, the area around the cursor will be enlarged by the factor 2. By repeating this step you can achieve the enlargement factor 4.

Zoom Out hotkey

You can zoom out of the document using the selected hotkey. Pressing this hotkey halves the area around the mouse key. This step can be repeated until the original desktop size is restored.

miroPINBOARD

The tool miroPINBOARD lets you zoom in and out of a document on-line. Click on the + or - button of the miroPINBOARD control panel.



For detailed information on miroPINBOARD refer to the miro•win Software Manual.

3. Technical data

Bus system

- PCI Local Bus

Compatibility

- VGA register compatible

Graphics processor

S3 VISION968 for PCI Local Bus
33 MHz clock frequency

Video memory

- *miroCRYSTAL DIP20:*
2 Mbyte VRAM
- *miroCRYSTAL DIP40:*
4 Mbyte VRAM

Power supply

- +5 V, max. 1 A
- +12 V, max. 0.01 A

Monitor communication

DDC2

Video timings

- *Horizontal scan frequency:*
31 kHz to 107 kHz, depending on the video mode
- *Vertical scan frequency:*
64 Hz to 100 Hz, non-interlaced, depending on the video mode
- *Max. pixel frequency:*
220 MHz

Options

Monitor, shielded monitor cable

Video modes

miroCRYSTAL DIP20:

Bits per pixel	Resolution	Horizontal scan frequency			
		107 kHz	100 kHz	93 kHz	85 kHz
16 (65,536 c.)	1152 x 864	100	100	100	90
8 (256 colors)	1600 x 1280	75	75	70	64
	1600 x 1200	80	80	75	68
	1408 x 1280	100	90	75	75
	1280 x 1024	100	90	80	80
	1152 x 864	100	100	100	90

max. vertical scan frequency in Hz

miroCRYSTAL DIP40:

Bits per pixel	Resolution	Horizontal scan frequency			
		107 kHz	100 kHz	93 kHz	85 kHz
16 (65,536 c.)	1600 x 1280	75	75	70	64
	1600 x 1200	80	80	75	68
	1408 x 1024	90	90	75	75
	1280 x 1024	100	90	80	80
	1152 x 864	100	100	100	90
8 (256 colors)	1600 x 1280	75	75	70	64
	1600 x 1200	80	80	75	68
	1408 x 1024	100	90	75	75
	1280 x 1024	100	90	80	80
	1152 x 864	100	100	100	90

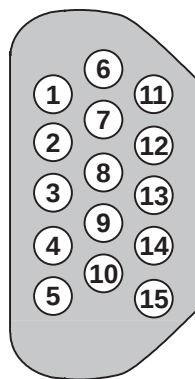
max. vertical scan frequency in Hz

Appendix

15-pin D-type video port

The miroCRYSTAL DIP graphics board is equipped with a 15-pin D-type connector to which the video cable attaches.

The following diagram 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	not used
5	ground (analog)
6	ground (red)
7	ground (green)
8	ground (blue)
9	5 V
10	ground (sync.)
11	ground (sync.)
12	DDC data
13	HSync
14	VSync
15	DDC clock

VESA Standard Feature Connector

Your miro graphics board can be used together with a video overlay board. For this purpose you need the VESA standard feature connector.

The following table provides a pin allocation overview.



VESA Standard Feature Connector

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	pixel clock
10	blanking interval
11	HSync
12	VSycn
13	ground
14	ground
15	ground
16	ground
17	enabling signal
18	enabling signal
19	enabling signal
20	not used
21	ground
22	ground
23	ground
24	ground
25	not used
26	not used



The pin allocation of the VESA standard feature connector has been adjusted for all miroCRYSTAL boards, so that these boards can be connected 1:1 to another graphics board via a flat ribbon cable.

miroCRYSTAL address range

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

– **I/O address range**

miroCRYSTAL occupies the address range of standard VGA **03B0h-03DFh** and parts of the 8514/A I/O address range.

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

Glossary

This glossary contains the most important concepts from the field of computer hardware and software. 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 directly. 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 assignment only differs slightly from the assignment 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.
AUTO-EXEC.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.
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, 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.
Color depth	Number of  bits used to represent the color information for each  pixel. At a black and white display 1 bit color depth displays $2^1=2$ 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.
DIP	D ocument I mage P rocessing. Electronic document processing.
DIP switch	D ual I ndependent P ackage switch. A row of small switches designed to make certain hardware presettings.
DOS	D isk O perating S ystem. The most common  operating system for PCs (P ersonal C omputer). MS DOS is the Microsoft 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 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	R andom A ccess M emory. An 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 horizontal pixels and 1024 vertical pixels are displayed on the monitor. The higher the resolution the more details the monitor can display.
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).
Serial interface	Also RS232. The serial interface transfers data through a data line bit by bit (all  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).
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 ( color depth).
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.
VGA	V ideo G raphics A rray (IBM), graphics board which displays 256 colors in the graphics mode.

Index

15-pin D-type video port	I	miroSUPERSCREEN	6
A		miroWINTOOLS	4
Address range	III	miroZOOM-Hotkey	9
B		Monitor	
Bus system	10	connecting	3
D		P	
DDC	5 - 6	Package contents	2
E		Pixel frequency	10
Elektrostatic charge	ii, 2	Power Management	6
F		Q	
Features	1	Quick installation chart	iv
G		R	
Glossary	VI	Resolution	1
Graphics processor	1, 10	S	
H		Service	IV
Horizontal scan frequency	10	Support	IV
I		System requirements	2
Installing hardware	3	T	
Installing software	4	Technical data	10
M		V	
miroCOLOR2GRAY	8	Vertical scan frequency	10
miroDIPTOOLS	4	VESA Standard Feature Connector	II
miroMONITOR SELECT	5	Video memory	1, 10
miroSCALE-Control	6	Video modes	11