

**miroCRYSTAL**

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**Basic Manual**

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**miroCRYSTAL**

Basic Manual.

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# For your own safety

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In the interest of your own safety and the flawless functioning of your new product and computer system pay attention to the following notes:

- 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 you before touching the components with your hands or any tools.
- Make sure that the components you want to connect to or add to your computer are in compliance with the computer's characteristics.
- Use only a shielded cable to hook up the monitor to the computer.
- Use only the power cable we supply to connect the monitor to the power source! Do not use any cable that supplies the power through the computer.
- In a single-screen configuration: You need to have a multi-frequency monitor that supports a horizontal frequency of at least 35 kHz. If you use the **True Color mode**, you always need a multi-frequency monitor.

## **Please note:**

**Developments that occurred after the deadline for this manual, and which are therefore not incorporated here, are dealt with in the INFO.ENG file on the disks supplied.**



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**4•**

**16 V**



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# About the Manuals

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The printed miroCRYSTAL system documentation consists of two parts: The Basic Manual and the Application Manual. Check the INFO.ENG files you find on the supplied disks for any changes that have occurred since the printing of the manuals. Also, some of the programs you receive have a detailed, integrated on-line help.

## How to start

The fastest way to get your system running is to first familiarize yourself with the Basic Manual you are reading just now. This describes the hard- and software installation of your miroCRYSTAL board.

Then refer to the Application Manual to tune your miroCRYSTAL system to the requirements of your applications. There you learn everything you need to know about the installation and use of the driver software supplied with your miroCRYSTAL board.

## Conventions

In the margins you see subheadings as well as ideograms, which are to help you find your way through this manual more quickly.

Important text passages which point out what is imperative to do (or not to do!) in a given situation are marked with the ideogram you see in the margin.



**All commands the user is to enter over the keyboard appear in this font:**

**install< >**

**The < > symbolizes the <Enter> key.**

## **Quick installation chart**

**Experienced users who are in a hurry to get started can refer to the following page for an overview of the installation. When in doubt read the detailed explanations in the manuals.**

# Quick Installation Chart

---

## Installing hardware, selecting monitor

### miroCRYSTAL

- Check system requirements, if necessary deactivate VGA/XGA in the computer!
- Configure DIP switch!
- Disconnect computer from power, disconnect all cables, install miroCRYSTAL in your computer, reassemble casing, reconnect all cables!
- Connect monitor to miroCRYSTAL!
- **Start installation program with install< >**

## Installing Windows 3 drivers

- **From the Main Menu of the miroCRYSTAL installation program, choose Install driver: Windows 3.0 or Install driver: Windows 3.1 and follow the instructions on the screen!**  
**Start Windows SETUP and reconfigure Windows for the driver you want!**

## Installing Autodesk drivers: miroGTI 4 miroGTI 12 miroADI, miro3D MAGICGEN

- From the Main Menu of the miroCRYSTAL installation program, choose the item **Install driver:...** for your application, follow the instructions on the screen and leave the installation program! Call **CRYST.BAT** with the parameter for your application (AutoCAD, AutoShade, AutoSketch, 3D Studio or GenericCADD).  
For 3D Studio edit the file 3DS.SET (see Application Manual)!  
Configure the driver in the Autodesk program!

## Install other drivers

- From the Main Menu of the miroCRYSTAL installation program, choose the item  
**Install driver: ...** for your application, follow the instructions on the screen and reconfigure your application!



# 1. Introduction

---

With **miroCRYSTAL** miro has added another powerful graphics board to the miroMAGIC board family. The features of miroCRYSTAL are ideally tuned to Windows applications. When combined with a suitable high-resolution monitor you get a state-of-the-art graphics system. There are two versions of miroCRYSTAL available:

**miroCRYSTAL**

**4•**

**16 and miroCRYSTAL 8•24.**

The high performance of the miroCRYSTAL boards is due to the following features:

## q **Speed**

Speed is without doubt one of the most important criteria when using professional graphics systems. miroCRYSTAL uses a graphics coprocessor which processes complex graphics operations, relieving the CPU of your computer. The coprocessor carries out the graphics operations much more speedily than the CPU. Extremely fast picture redraws are the result.

## q **Resolution**

miroCRYSTAL provides highest resolutions, offering ergonomic quality. The resolution of 1152 x 864 pixels (non-interlaced) is especially worth mentioning. With monitors from 17" this resolution ideally utilizes the screen when running graphical user interfaces such as Windows.

## q **High Color/True Color**

Both board versions, miroCRYSTAL

**4•**

16 and miroCRYSTAL 8•24, can run a True Color (16.7 million colors) and a High Color mode (32,768 colors). That is, each pixel can take any color from a palette of 16.7 million colors or 32,768 colors.



q **miroCRYSTAL-VGA**

On the miroCRYSTAL board a VGA chip is integrated. Thus, the computer can boot and run DOS applications in the VGA mode without needing an additional VGA board. The miroCRYSTAL VGA provides a standard VGA (640 x 480 pixels) and a Super VGA resolution (800 x 600 pixels). If you want to use a VGA which is already installed in your computer, you can switch off the miroCRYSTAL VGA.

q **Multimedia support**

Instead of your computer monitor you can connect a TV monitor to miroCRYSTAL via the miroVIDEO-Converter which is optionally available. This enables you among other things to record computer animations on a video recorder.

q **Upgrade kit**

The miroCRYSTAL

4.

16 graphics board can be upgraded without any difficulties. To use the High Color mode also at very high resolutions, you only have to expand the video memory of the miroCRYSTAL

4.

16 by 1 MB, installing the upgrade kit which is optionally available.

q **Software compatibility**

The miroCRYSTAL boards have a standardized software interface, the 8514/AI (Adapter Interface). The AI enables the immediate use of applications which access this interface directly.

q **Drivers**

In addition to the Windows drivers, miro provides a wide range of drivers for miroCRYSTAL utilizing the facilities of the miroCRYSTAL hardware with a regard to speed, resolutions, and colors in an ideal way.



## 2. miroCRYSTAL Hardware

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### 2.1 System requirements

---

Make sure that your system meets the following requirements.

#### Computer

IBM AT or compatible computer with an empty 16-bit slot (also 8-bit slot or EISA bus)

#### Operating system

MS-DOS from version 3.x

#### Monitor

In the **single-screen configuration**:

**Multi-frequency monitor** with separate inputs for the horizontal and vertical sync signals which supports horizontal frequencies of at least 35 kHz

In the **dual-screen configuration** (see «2.3 System configurations») you need a **multi- or a fixed-frequency monitor** with separate inputs for the horizontal and the vertical sync signals which support a horizontal frequency of at least 35 kHz. With a fixed-frequency monitor you cannot run the True Color mode.

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If you want to use the **True Color mode**, you **always**, that is also in the dual-screen configuration, need a **multi-frequency monitor**.

A **TV monitor** can be connected to the graphics board via a video encoder, for example the **miroVIDEO-Converter**. For information on the required characteristics of the TV monitor and on connecting it, refer to the documentation supplied with the miroVIDEO-Converter.



## 2.2 Before you start

---

### **Package contents**

Before you start to install your miroCRYSTAL graphics board, please make sure that your miroCRYSTAL system is complete.

- miroCRYSTAL graphics board
- disk set
- documentation
- optional:
  - monitor, shielded monitor cable, upgrade kit (1 MB video memory, only for miroCRYSTAL miroCRYSTAL 4•16), miroVIDEO-Converter

If parts are missing, please contact your dealer.

### **DIP switch**

On the board you will find an 8-position DIP switch. The configuration of the DIP switch determines the hardware configuration of the miroCRYSTAL.

### **VGA in the computer**

On the miroCRYSTAL board a VGA chip is incorporated. If you want to use this miroCRYSTAL VGA, that is in the single-screen configuration you have to deactivate a motherboard VGA which might be installed in your computer before you install the miroCRYSTAL board. A VGA/XGA board which is already installed has to be removed from your computer.

### **Address conflicts**

miroCRYSTAL is extremely reliable. To ensure your system operates properly, however, you have to avoid address conflicts.

Before you begin with the installation, make sure that the addresses used by the miroCRYSTAL graphics board will not be used by other expansion boards in your computer.





For detailed information on the address space used by miroCRYSTAL, refer to appendix A.

The I/O address space used by miroCRYSTAL boards (2E0h-2EFh) might also be used by network cards (e.g. ARCnet). Since the addresses of the miroCRYSTAL cannot be modified, you have to set the I/O address of the network card preferably to the address space from 300h to 340h before you start to install miroCRYSTAL. The driver of the network card (e.g. Novell IPX.COM) has to be set to this address also. In addition, you have to select an interrupt (e.g. IRQ5) which is not used already.

#### **EISA configuration file**

If you want to install your miroCRYSTAL board in a computer with an EISA bus, you can configure this bus for your board. On the installation disk you will find the appropriate configuration file **!MIRO100.CFG**. Use the EISA configuration program supplied with your computer for configuring the bus. For detailed information, refer to the manual of your computer.

#### **Static electricity**

Graphics boards are very sensitive to static electricity. To avoid damage caused by static electricity, store the board in its antistatic packaging until you install it. Keep the packaging for possible future transports.

## **2.3 System configurations**

---

miroCRYSTAL boards can be operated in the single- and in the dual-screen configuration. A dual-screen configuration is only possible if you use a VGA/XGA already installed in your computer and the monitor connected to it.

If you want to use the miroCRYSTAL VGA, you have to remove the VGA/XGA board which is possibly installed in your computer. A motherboard VGA has to be deactivated. In any case only one VGA or XGA must be active!



### Single-screen configuration

In the single-screen configuration miroCRYSTAL is connected to a **multi-frequency monitor**. The VGA as well as the high-resolution image are displayed on the monitor connected to the miroCRYSTAL board. For this configuration the miroCRYSTAL VGA has to be switched on, that is DIP switch 1 has to be in the on position.

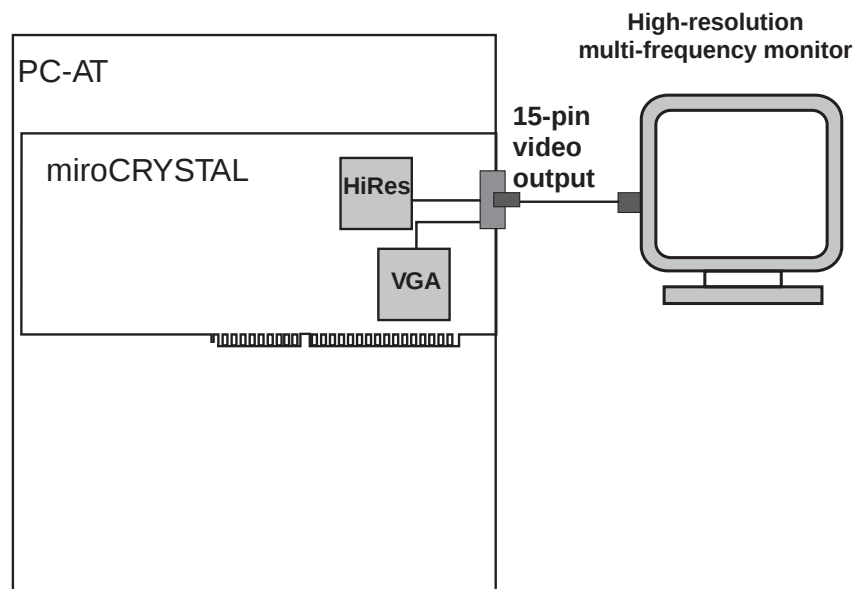
### Dual-screen configuration

+

In the dual-screen configuration the high-resolution board miroCRYSTAL is used in addition to a standard VGA system. Both systems have a separate monitor.

Instead of the miroCRYSTAL VGA an already existing VGA/XGA or a motherboard VGA is used. In this case the miroCRYSTAL VGA has to be deactivated, that is DIP switch 1 has to be in off position.

The following figure shows the dual-screen configuration where an already existing VGA/XGA board is used.



*Single-screen configuration*

## 2.4 Setting the DIP switch

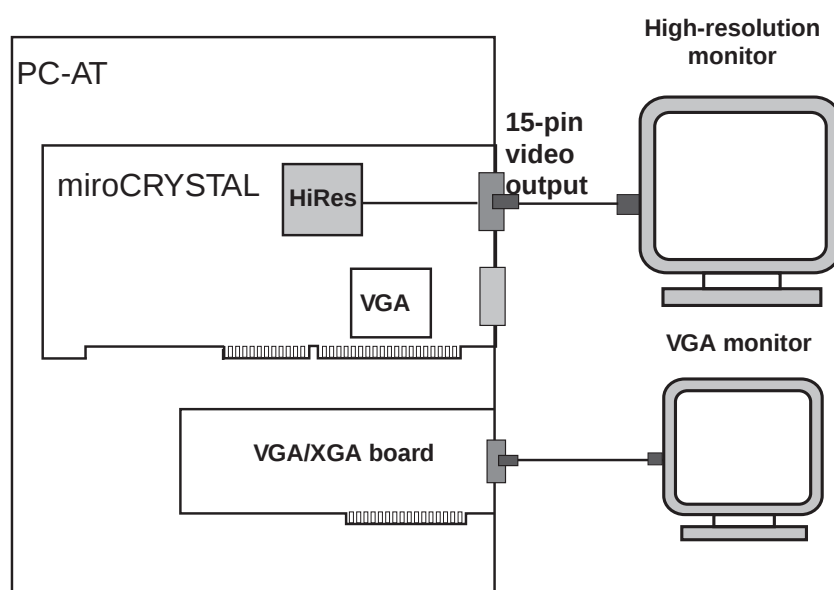
---

Depending on the system configuration, the DIP switch (8 settings) of your miroCRYSTAL board has to be set. The following figure shows the location of the DIP switch:

**miroCRY-  
STAL 4•  
16**

The following figure shows the correct DIP switch setting of the miroCRY-  
STAL 4•

16 as it is preset by the manufacturer. The miroCRYSTAL



*Dual-screen configuration*

VGA is activated.

**miroCRYSTAL 8•24**

The following figure shows the correct DIP switch setting of the miroCRYSTAL 8•24 as it is preset by the manufacturer. The miroCRYSTAL VGA is activated.

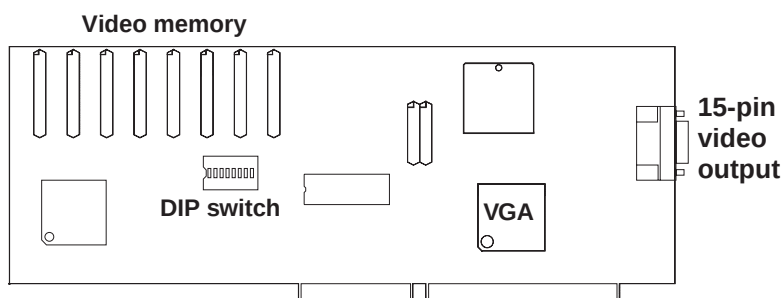
Each switch has its particular function:



## Switch 1

Switch 1 activates and deactivates the miroCRYSTAL VGA. The manufacturer has preset DIP switch 1 to the on position. The two positions mean:

- on: miroCRYSTAL VGA activated
- off: miroCRYSTAL VGA deactivated

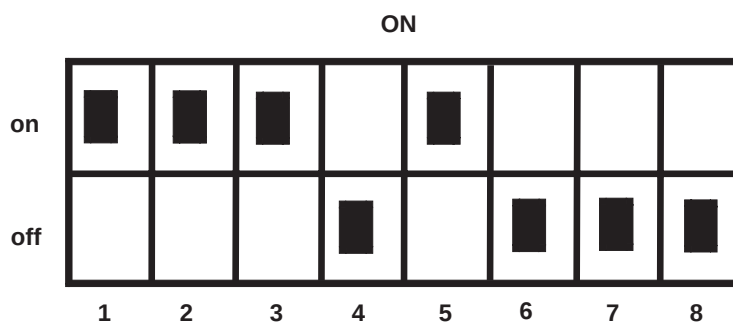


*Board layout exemplified by miroCRYSTAL 4•16*

## Switches 2-6

Switches 2-6 relate to the video memory of your miroCRYSTAL graphics board. miroCRYSTAL 4•

16 has a video memory of 1 MB, miroCRYSTAL 8•24 has 2 MB. For the correct presettings by the manufacturer, re-

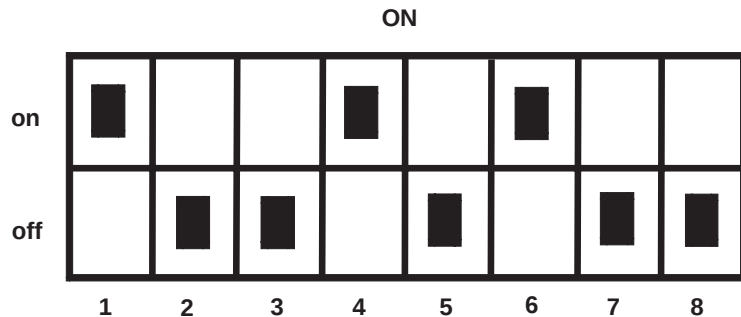


*DIP switch of miroCRYSTAL 4•16*

fer to the figures above. If you have upgraded miroCRY-

STAL 4.

16, you have to configure the DIP switch in the same way as for a miroCRYSTAL 8-24.



*DIP switch of miroCRYSTAL 8-24*

### Switches 7-8

Switches 7 and 8 are reserved. The presettings should not be modified.

## 2.5 Installing the board

---

After you have determined your system configuration and have set the DIP switch accordingly, you can install your miro graphics board. You need nothing but a screwdriver. Proceed as follows:

- Turn off the computer and all peripherals connected to it. Unplug the computer from the mains supply and disconnect all other cables.
- Loosen the screws from the cover of your computer and remove it.
- To discharge yourself from static electricity, touch the power supply.



- In the single-screen configuration:  
If necessary, remove the VGA/XGA board installed in the computer or deactivate the motherboard VGA.
- Select an empty 16-bit slot (8 bit- or EISA slot). Remove the slot cover at the back of the computer. If necessary, loosen the screws of the cover.
- Carefully insert the board in the slot. To do so, hold the board at the top edge and push both sides at the same time gently down into the slot. Press the top edge to ensure that the board is firmly seated in its slot.

Please, don't force the board into the slot! Otherwise you run the risk of bending the contacts at the bracket with the sockets. If you cannot insert the board easily, pull it out and try again.

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- Fasten the clamp of the board to the back panel of your computer.
- Replace the cover of your computer and reconnect the peripherals.

### **Connecting the monitor**

To connect the monitor to the computer, use a suitable shielded monitor cable as is supplied by miro.

- Turn off the computer and the monitor.
- Insert the 15-pin connector of the cable attached to the high-resolution monitor to the 15-pin socket of the miroCRYSTAL and fasten the screws on the connector.
- Connect the red, green, and blue BNC plugs to the VIDEO IN connectors of the monitor labelled **R**, **G**, and **B**. Connect the yellow BNC plug to the connector labelled **V** and the black plug to the connector labelled **H/HV**.
- Reconnect the monitor to the mains supply using the suitable cable.

After you have installed the miroCRYSTAL hardware, your miro graphics system can be put into operation: it can now run in a 8514/A compatible mode at 1024 x 768 pixels with a refresh rate of 88 Hz interlaced.

To be able to use the whole function range, however, you should now install the software supplied with your system.





## 3. miroCRYSTAL Software

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### 3.1 In general

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After you have installed your hardware, you can install the software. For this purpose you will find an installation program on the installation disk that came with your miro graphics system. This program adjusts the drivers supplied with your miroCRYSTAL board and the monitor to each other. In addition, it installs the drivers for your applications on your hard disk. The Application Manual gives a detailed explanation of the installation of the application drivers.

The first part of the documentation gives you information about the installation program itself as well as about selecting and adjusting a monitor.

The miroCRYSTAL disks are not copy-protected. If you haven't done so already, you should make backup copies of the miroCRYSTAL disk(s) with the DOS command **DISKCOPY**. Keep the original disks in a safe place and only work with the copies.

### 3.2 The installation program

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The installation is done interactively: a dialog leads you through the program while you are answering questions. The installation program can be run in several languages: choose the language you are most comfortable with to do the installation. To make the whole process as uncomplicated as possible, the program offers a context-sensitive help feature, displaying the information you need on the screen. You may use the mouse or keyboard to operate the program.

This is what you need to install the software:



- the miroCRYSTAL disk set
- the Windows 3 installation disks if you want to install the drivers for Windows 3

**Calling the program** To start the installation program, proceed as follows:

- Insert the installation disk in the disk drive you want to use for the installation and switch to this drive.
- Start the installation program by entering:  
**install< >**

After having started the installation program, the menu **Language Selection** will appear in German, its default setting. Choose the language you want and switch to the **Main Menu** by choosing the option **Continue** and pressing the enter key.

**Only with the initial installation:** Before you get to the Main Menu, you will be advised by a screen message to eliminate any address conflicts *before* starting the installation.

## Masks



All the masks of the installation program follow the same pattern. Each one is divided into four segments:

- **Title bar:**  
The Title bar tells you which mask you are just reading.
- **Action window** (on the left):  
The Action window gives you the available options. Here you also have to enter the text the installation program needs as additional information.
- **Help window** (on the right):  
The Help window offers information about the item you chose.
- **Bottom line:**  
In the bottom line you will find a list of the keys to control the program.



## Main Menu

In the Main Menu you find the following items:

- **Current information:**

This menu item in the Main Menu tells you of possible changes that have occurred since this manual was printed. This text is identical with the INFO.ENG file on the miroCRYSTAL Installation disk. Use the arrow symbols at the right edge and bottom screen to scroll through the text.

| miroCRYSTAL Installation - Main Menu                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre>Current information Install Monitor and System Adjust monitor Install driver :   Windows 3.0      Windows 3.1   AutoCAD 12       AutoCAD 10/11   AutoCAD 9/10     AutoShade   AutoSketch       3D Studio   GenericCADD      PC-DRAFT   MicroStation</pre> | <pre>- Current information -  The miroCRYSTAL disk contains an INFO.ENG text file; use this option to view the file on the screen.  You will get the latest information about developments that occurred after the manual had been printed.</pre> |
| <pre>End          Back</pre>                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                   |
| <pre>&lt;↑↓→&gt; = SELECTION  &lt;↵&gt; = CONFIRM  &lt;ESC&gt; = END</pre>                                                                                                                                                                                     |                                                                                                                                                                                                                                                   |

*Main Menu of the installation program*

- **Install monitor and system:**

With this option you install the system files and select the monitor.

- **Adjust monitor:**

With this option you can check and – if necessary – correct the image position and size with the help of a test picture. You have the possibility to save the modified parameters in a file.



– **Install drivers: ... :**

With this menu item you install the drivers for your application on your hard disk. Since the number of drivers increases constantly, the Main Menu may look different than the figure shown above. For details on the installation and the operation of the supplied drivers, refer to the Application Manual.

Please perform the installation steps in the order as they appear in the Main Menu, that is first install the monitor and the system, then adjust the monitor and at last install the application drivers.

## 3.3 Installing monitor and system

---

The first installation step is installing the miroCRYSTAL system files.

- In the Main Menu select the item **Install Monitor and System**.



## Install system software

Now, the menu **Install system software** appears. Here the installation program needs the drive and the path for the directory to be created for the miroCRYSTAL system files (default is **C:\CRYSTAL**).

- To accept the default press the <Enter> key or overwrite the default and then press <Enter>.
- Select the option **Install** and then press <Enter>.

| miroCRYSTAL Installation - Install system software                                             |                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre>Source      : B:\ Destination: C:\CRYSTAL</pre><br><pre>Configure Install      Back</pre> | <pre>- Enter destination path -  Enter the destination drive and directory to which the software will be copied.  Press Enter to accept the default or overwrite it.</pre> |
| <pre>&lt;↑↓→&gt; = SELECTION  &lt;↵&gt; = CONFIRM  &lt;ESC&gt; = BACK</pre>                    |                                                                                                                                                                            |

*Installation program: Install system software*

As a result of the installation the subdirectory **C:\CRYSTAL** will be created on your hard disk and the **miroCRYSTAL** system files are copied into it; here the most important ones:



- **MAGICINI.EXE:** You have to load this file before you call the applications. It initializes your **miroCRYSTAL** before every system start-up so that your applications run, non-interlaced, in the standard 8514/A resolution. During the installation the file **AUTOEXEC.BAT** will be changed in such a way that it contains the program call **C:\CRYSTAL\MAGICINI.EXE**. If there is no file called **AUTOEXEC.BAT** on your computer, it will be created automatically in the main directory **C:\**. After the installation is finished you have to reboot to activate the changes.
- **TESTPIC.EXE:** With this program you create a test picture and thus are able to check right away whether or not your **miroCRYSTAL** system works properly.
- **HDILOAD.EXE:** The program **HDILOAD.EXE** is copied into the directory **C:\HDIPCDOS**. Before you call applications whose graphics drivers address the Adapter Interface (AI) you must load **HDILOAD.EXE**.
- **CRYST.BAT:** The batch file **CRYST.BAT** is copied into the root directory **C:\**. This batch file tells certain applications (e.g. AutoCAD applications) the name and the path of the driver supplied by **miro** by setting an environment variable. **CRYST.BAT** must not be renamed or moved into another directory. For more information on **CRYST.BAT**, refer to the Application Manual.

**All monitor files are copied into the subdirectory **C:\CRYSTAL\MONITORS** which is also created during the installation.**



## Configure system

After the installation has been completed, the menu Configure system appears.

| miroCRYSTAL Installation - Select Monitor                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Source : D:\</p> <p>Destination: C:\MAGIC</p> <p>Selected monitor:</p> <p>64 kHz multi frequency</p> <div><p>35 kHz multi frequency</p><p>48 kHz multi frequency</p><p>58 kHz multi frequency</p><p>64 kHz multi frequency</p><p>68 kHz multi frequency</p><p>78 kHz multi frequency</p><p>80 kHz multi frequency</p></div> <p>Install                  Back</p> | <p>- Select monitor -</p> <p>Choose the monitor you want to use from the list and confirm your selection. The menu item &lt;Install&gt; adjusts your miroCRYSTAL card to the monitor of your choice.</p> <p>If you can't find your monitor on the list, choose the monitor with the next lower horizontal frequency and install it.</p> <p>Finally, choose the option &lt;Adjust monitor&gt; from the main menu.</p> |
| <p>&lt;PAGE↑ PAGE↓ POS1 END&gt;=SCROLLING &lt;↑↓&gt;=SELECTION &lt;↵&gt;=CONFIRM &lt;ESC&gt;=BACK</p>                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                      |

*Installation program: Configure system*

**This menu consists of three items:**

– Board type:

**The board type is automatically recognized by the installation program. Here you don't have to enter anything.**

– Source:

**Here you have to enter the drive and the directory from where the monitor files should be copied.**

– Monitor:

**Here you have to enter your monitor.**

- **Enter the drive and the directory from where the monitor files should be copied: either the disk drive or C:\CRYSTAL depending on whether you have installed your monitor already or not.**



- **Select your monitor from the list. Use the arrow symbols *s* and *t* to scroll through the list. Press the <Enter> key to mark your monitor.**

The name of the monitor you use is not in the list:

**Choose a monitor with a horizontal frequency that equals the maximum horizontal frequency of your monitor. Refer to your monitor's user manual to find the necessary information.**

*Example:* When you use a multi frequency monitor with a maximum horizontal frequency of 64 kHz select 64 kHz multi frequency from the list.

If you can't find exactly the same horizontal frequency in the list choose the monitor with the next lower value.

- **Select the menu item Configure.**

## **3.4 Adjusting the monitor**

---

- **In the Main Menu select the item Adjust monitor**

With this option you can check and – if necessary – correct the image position and size with the help of a test picture. You have the possibility to save the modified parameters in a file.



| miroCRYSTAL Installation - Adjust Monitor                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Monitor resolutions:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> 1280 x 1024 (256)<br/> 1280 x 960 (256)<br/> 1152 x 864 (256)<br/> 1024 x 768 (32768)<br/> 1024 x 768 (256) </div> <p>Ho. frequency                      53      kHz</p> <p>Monitor name<br/>64_kHz_Multifrequenz</p> <p>Install                      Back</p> | <p>- Test picture -</p> <p>Choose the resolution for which you want to check the image size and position.</p> <p>Use the following keys for possible corrections:</p> <p>Frame position:                      Cursor keys<br/> Frame size           : &lt;Ctrl&gt; + Cursor keys</p> <p>Save               :                      Enter key<br/> Abort               :                      &lt;Esc&gt; key</p> |
| <↑↓> = SELECTION      <↵> = CONFIRM      <ESC> = ABORT                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                 |

*Installation program: Adjust monitor*

**Within the corresponding menu you will see the monitor you chose and the possible resolutions with the number of colors to be displayed.**

**For each resolution you can call a test picture and correct postion and size if you want to:**

- **Mark the desired resolution, press the <Enter> key and a test picture appears.**
- **Now use the direction keys to change the picture's position. If you hold down the <Control> key you can change the picture's size with the direction keys. Press the <Enter> key to accept the settings; press the <Esc> key to reject the setting.**

**Note: If you use a fixed-frequency monitor you should not modify the image size. This would result in a change of the horizontal frequency and an asynchronous image.**



- Use the <Enter> key to get the test picture for the next resolution. Press the <Esc> key to abort the monitor adjusting.

Also, it is possible to save the new settings in a file. To do so, create a name for your settings (maximally 39 characters). Proceed as follows:

- One after the other, set position and size for each resolution, as described above.
- Overwrite the monitor name, if you want to choose a name for your settings.
- Activate the option Install so that your monitor timing will be saved in a file.  
The file name is created by taking the first six characters of the name you assigned plus two digits. The monitor selection list accepts the name.

The option Back cancels all changes and returns to the Main Menu.



## 4. Using miroCRYSTAL

---

### 4.1 In general

---

The miroCRYSTAL package includes powerful drivers which allow you to run Windows 3, various Autodesk and other CAD applications on your miroCRYSTAL system. Refer to the Application Manual for details about the installation and use of the driver software.

Since the miroCRYSTAL cards are 8514/A compatible, you are free to also work with many application programs for which we do not supply drivers, as long as these applications support the 8514/A standard. What makes this possible is the Adapter Interface which was copied during the installation to the directory containing the miroCRYSTAL system files (default C:\CRYSTAL). The corresponding font files are in the directory **C:\HDIPCDOS**.

Before you start your application call the MAGICINI.EXE – if you haven't done so already – and load the Adapter Interface with the command **hdiload< >**. The resolution of 1024 x 768 pixels meets the 8514/A standard ergonomically!

### 4.2 In case of problems

---

Problems that crop up when you are working with your miroCRYSTAL system can usually be traced back to an incorrect installation or a combination of diverse hardware components.

The following list will help you find the cause of the problem and its solution.



**Again:  
Avoid address con-  
flicts**

To avoid conflicts right from the start, it is imperative to check for address conflicts before you install your miroCRYSTAL board. Appendix A shows the addresses occupied by your miroCRYSTAL board.

Furthermore, if you install additional expansion boards (such as ARCnet) **after** having installed the miroCRYSTAL board, you have to make sure that the other board(s) do not access the addresses used by miroCRYSTAL.

**Checking the hard-  
ware installation**

Nevertheless, if you do experience problems, check the installation of the miroCRYSTAL hardware first:

- Make sure the miroCRYSTAL board is properly seated in its slot.
- Check all cable connections!
- Install the miroCRYSTAL board in another suitable slot!

**Checking  
compatibility**

Our miroCRYSTAL should not be incompatible with common expansion boards, such as interface cards. Still, just in case miroCRYSTAL and another (rare) expansion board installed in your computer are not compatible, remove the board(s) in question one by one and test to see if your miroCRYSTAL system now functions properly.

**Deactivating the  
Memory Manager**

If you still can't get your system to function properly, check whether software for memory management was installed in your computer, and if so, disable the Memory Manager and test your miroCRYSTAL system once more.

## **4.3 Equipment maintenance**

---

To make sure your miroCRYSTAL graphics system will work perfectly for years to come, pay attention to the following care instructions:



- Do not subject the monitor to direct sunlight. Avoid excessive exposure to heat, dust, or humidity.
- Make sure there is sufficient ventilation; don't place such things as books or magazines on or near the monitor.
- Don't set up the monitor near devices that emit magnetic fields, such as magnets, speaker systems, printers, or disk drives. Magnetic fields might cause distorted representations on the screen.
- Transport monitor and graphics board only in their original packaging.
- Use a household glass cleaner and a clean cloth on your screen. Do not spray the cleaner onto the screen, since the fluid could run into the casing and damage the monitor.
- Pull the monitor's power cable. Use a damp, but not wet, lintfree cloth for cleaning. Do not use aerosol sprays, solvents or other harsh cleaning agents which might damage the surface.





## 5. Technical Data

---

### Bus system

- ISA AT bus ; compatible with 8-bit slot and EISA bus

### Compatibility

- IBM 8514/A register compatible
- VGA register compatible

### Graphics coprocessor

- C&T 82C481
- 48 MHz clock frequency

### Video modes

| Resolution<br>(pixels) | Number of Colors    |                             |
|------------------------|---------------------|-----------------------------|
|                        | miroCRYSTAL<br>4-16 | miroCRYSTAL<br>8-24         |
| 1152 x 864             | 16                  | 256                         |
| 1024 x 768             | 256                 | 256/32,768                  |
| 768 x 512              | 32,768              | 16.7 million                |
| 640 x 480              | 256/32,768          | 256/32,768/<br>16.7 million |
| 512 x 384              | 16.7 million        | –                           |

### Video memory

- miroCRYSTAL  
4.  
16:1 MByte VRAM



- miroCRYSTAL 8•24: 2 MByte VRAM

### **miroCRYSTAL VGA**

- 640 x 480 pixels with 16 colors
- 600 x 800 pixels with 16 colors
- 256 KByte DRAM
- VGA can be turned off

### **Power supply**

- +5V, max.1.45 A
- +12V, max. 0.01 A

### **Video timing**

- Horizontal scan frequency:  
31 kHz to 68 kHz
- Vertical scan frequency:  
60 Hz to 85 Hz, non-interlaced
- Pixel frequency:  
14.5 MHz to 90 MHz

### **Options**

- Monitor, shielded monitor cable
- Video outputbox
- For miroCRYSTAL  
4•  
16:  
upgrade kit (1 MB VRAM)

### **Radio Interference**

- Amtsblattverfügung Nr. 243/1991
- FCC class "A"



## Appx. A: **miroCRYSTAL Address Space**

The following register definition gives an overview of the address space of the miroCRYSTAL boards.

Of the addressable 16 bit the lower 10 bit are allocated for the base address, the upper 6 bit code the board's register.

The base address of the I/O port used by miroCRYSTAL is 2E8.

### CLUT

Also, there are the I/O addresses of the Color Lookup Table (CLUT). The following table lists these addresses:

| Address |               |
|---------|---------------|
| x2E8    | 8514/A        |
| 2EA     | RAMDAC (CLUT) |
| 2EB     | RAMDAC (CLUT) |
| 2EC     | RAMDAC (CLUT) |
| 2ED     | RAMDAC (CLUT) |

### VGA

If your miroCRYSTAL VGA is activated, the following VGA addresses are used in addition to the addresses given above:

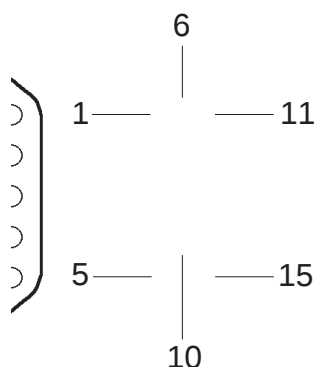
|                  |                   |
|------------------|-------------------|
| I/O Adresses     | 03C <sub>xh</sub> |
|                  | 03D <sub>xh</sub> |
| VGA video memory | A000h - BFFFh     |
| VGA BIOS         | C000h - C7FFh     |



## Appx. B: 15-Pin D-Type Video Output

The miroCRYSTAL board is equipped with a 15-pin D-type connector to which you attach the video cable, which is connected to the monitor.

The following illustration and the table show the video output and the corresponding pin allocation:



*15-pin D-type video output*

| Pin No. | Pin Allocation   |
|---------|------------------|
| 1       | red              |
| 2       | green            |
| 3       | blue             |
| 4       | monitor ID bit 2 |
| 5       | ground (analog)  |
| 6       | ground (red)     |
| 7       | ground (green)   |
| 8       | ground (blue)    |
| 9       | free             |
| 10      | ground (sync)    |
| 11      | monitor ID bit 0 |
| 12      | monitor ID bit 1 |
| 13      | HSync            |
| 14      | VSynC            |
| 15      | free             |



## Appx. C: **MAGICINI.EXE: Parameters**

---

The program for initializing miroCRYSTAL can be called with different parameters:

| Parameter | Explanation                                                                                                  |
|-----------|--------------------------------------------------------------------------------------------------------------|
| -?        | Overview over all parameters                                                                                 |
| -DS       | Dual screen configuration will be set; video memory is deleted and the high-resolution monitor is activated. |
| -DL       | Digital Loopthrough is set.                                                                                  |
| -L        | Calls the “It’s a miroCRYSTAL” animation                                                                     |



## Appx. D: Installing the Upgrade Kit

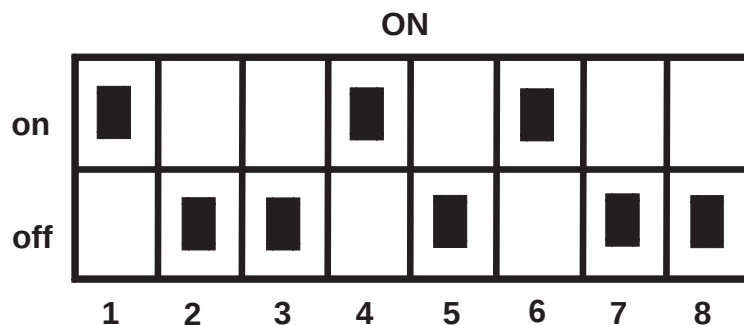


*Memory module for miroCRYSTAL 4•16*

With the optional upgrade kit you can upgrade the video memory of the miroCRYSTAL

4•

16 graphics board without difficulties, expanding the video memory from 1 MB to 2 MB. After you have upgraded the



*DIP switch of miroCRYSTAL 8•24*

video memory, you can take advantage of all video modes a miroCRYSTAL 8•24 board offers. For these video modes, refer to the table on page 5-1.

The upgrade kit consists of 8 memory modules of a total of 1MB. You insert these in the sockets which are located between the memory modules which already have been installed on your graphics board.

For the location of the video memory on your miroCRYSTAL

4•

16 graphics board, refer to the figure «Board layout exemplified by  
miroCRYSTAL

4•

16» on page 2- 6.



Proceed as follows:

- Turn off the computer and all peripherals connected to it. Disconnect all power and connecting cables.
- Remove the cover of the computer.
- Discharge electrostatic charge from you by touching the power supply unit.
- Remove the miroCRYSTAL board carefully from your computer.
- Insert the memory modules in the sockets.  
The memory modules have a bevelled edge (in the figure: at the top right hand side). You have to insert the memory modules in a way that the bevelled edge is parallel to the bevelled edges of the memory modules already installed. The writing on the modules must not face the 15-pin video output.

Make sure that you don't bend the pins of the memory modules. The memory modules must be **firmly seated** in their sockets.

- Set the DIP switch.  
After upgrading the video memory to 2 MB you have to set the DIP switch for a miroCRYSTAL 8-24 (see figure).
- Insert the board.  
Reinstall the miroCRYSTAL board as is described in chapter 2.5.
- Reinstall the miroCRYSTAL software.  
Install the miroCRYSTAL software once again using the miroCRYSTAL installation disk as is described in chapter 3 of the Basic Manual.
- Reinstall and configure the application drivers.  
Install and configure the application drivers you need as is described in the Application Manual.



## Appx. E:   Setting the TV Mode

---

If you own a video encoder such as the miroVIDEO-Converter and want to show a computer image on your TV or record it with your VCR, your miroCRYSTAL graphics board must run in TV mode. You can switch to TV mode with the help of the installation program (from version 3.1). First though, the miroCRYSTAL board must be installed in your computer and the miroVIDEO-Converter must have been connected according to the instructions in the documentation.

If you have not installed the monitor files for the TV mode already, you need the installation disk. If you have already installed the monitor files for the TV mode once (the monitor selection list contains the item miroVIDEO-Converter), you can start the installation program directly from the hard disk (usually from the directory C:\CRYSTAL).

This is what you need to do:

- Start the installation program from the hard disk (usually C:\CRYSTAL) or, if this is an initial installation, from the installation disk by entering:

**install** <↵>

- Perform the steps described in **3.3 Installing monitor and system** and – if desired – adjust the TV monitor as described in **3.4 Adjusting the monitor**. From the monitor list select the item **miroVIDEO-Converter**.
- **Only for Windows:**  
If you are working with Windows you have to choose a resolution suitable for the TV mode (640 x 480 pixels; 768 x 512 pixels) via Windows' Setup program.
- Start you application which will now run over the TV/VCR.



To switch back to your high-resolution computer monitor, proceed like this: select your computer monitor with the help of the installation program and, if you are working with Windows, choose the suitable resolution and number of colors with the Setup program.





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