miroCRYSTAL 16S/24S/32S

Hardware Manual

GP

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miroCRYSTAL 16S
miroCRYSTAL 24S
miroCRYSTAL 32S

Hardware Manual

miroCRYSTAL 16S (24S/32S).

Hardware Manual.

Version 1.0/E. October 1993.

VDOK-CRYS-101

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Dear miro customer,

Congratulations on purchasing this miro graphics board!

If you have purchased a Local Bus graphics board, please note that your computer might be damaged or destroyed through the incorrect installation of a Local Bus board.

To avoid problems due to incompatibility, please refer to your computer manual and follow the installation instructions contained in this manual. Before switching on your computer, make sure that the graphics board has been installed correctly in the correct slot.

Your miroTEAM

For your own safety...

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.
- Computer components such as graphics boards are sensitive to static charge. Discharge any electrostatic charge 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.
- Only use a shielded cable to connect the monitor to the computer.
- Only use the supplied power cable to connect the monitor to the computer. Do not use any cable that supplies the power through the computer.
- You need to have a high-resolution multifrequency monitor, that supports a horizontal frequency of at least 48 kHz.

Contents

About the manual

This hardware manual explains how to install the miroCRYSTAL 16S/24S/32S graphics boards. The quick installation chart overleaf gives you an overview about the hardware and software installation.

Conventions

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.

You will recognize instructions telling you step by step what to do by the bullet:

- Start Windows.

All keyboard commands appear in this font:

install <↵>

<↵> represents the enter key.

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

Quick installation chart

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

Hardware

1. Check the system requirements, make copies of the supplied disks.
2. Check and/or change jumper and DIP switch settings if necessary.

   ↳ *Dual-/multiscreen configuration with one miroCRYSTAL 16S/24S/32S and one miroCRYSTAL 8S:*
   Check jumper setting on miroCRYSTAL 16S/24S/32S.
   Set DIP switch on miroCRYSTAL 8S.

   ↳ *Multiscreen configuration with two miroCRYSTAL 16S/24S/32S:*
   Set jumper on one miroCRYSTAL 16S/24S/32S.
   Check factory-set jumper setting on second miroMAGIC S4.

3. Open computer.
4. Depending on its bus type install graphics board into the ISA-, EISA-, VL- or PCI slot.
5. Connect monitor/s.

Software

6. Install miro drivers for miroCRYSTAL 16S/24S/32S. The order of installation (CAD and Windows) is not obligatory.

   ↳ *Windows in the single-screen configuration:*
   You need the *miroWIN Disk 1* and the *miroWIN Disk 2.*
   Insert *miroWIN Disk 1*.
   In the Windows Program Manager in the *File* menu choose *Run....*
   Depeding on your disk drive enter **a:install** or **b:install**.
   Follow the instructions given by the installation program.

   ↳ *Windows in the multiscreen configuration:*
   You need the *miroTWINFACE Disk 1* and *miroWIN Disk 1* and *2.*
   Insert *miroTWINFACE Disk 1*.
   In the Windows Program Manager in the *File*-menu choose *Run....*
   Depending on your disk drive enter **a:install** or **b:install**.
   Follow the instructions given by the installation program.

   ↳ *CAD:*
   You need the *miroCAD Disk 1*.
   Insert *miroCAD Disk 1*.
   Depending on your disk drive enter **a:install** or **b:install**.
   Follow the instructions given by the installation program.
   If necessary, configure installed drivers.

↳ *CALIBRATION TOOL:*
Insert *miroCALIBRATION Disk 1*.
In the Windows Program Manager in the *File*-menu choose *Run....*
Depending on your disk drive enter **a:install** or **b:install**.
Follow the instructions given by the installation program.


miro

1. Introduction

miroCRYSTAL 16S/24S/32S is a powerful graphics board for professional CAD and Windows users.

The boards vary in the amount of display memory; miroCRYSTAL 16S has 2 MB, miroCRYSTAL 24S 3 MB and miroCRYSTAL 32S 4 MB.

These characteristics set the miroCRYSTAL 16S/24S/32S apart:

q **Graphics accelerator**
The S3 86C928 graphics processor was developed especially for the acceleration of applications under Windows.

q **For the first time all three boards for four bus standards.**
miroCRYSTAL 16S/24S/32S is now available for the ISA, EISA, VL and PCI bus.

q **Resolutions/Colors**

	miroCRYSTAL16S	miroCRYSTAL24S	miroCRYSTAL32S
Resolutions	Colors		
1408 x 1024	8 Bit	-	8/16 Bit
1280 x 1024	8 Bit	-	8/16 Bit
1152 x 864	8 Bit	-	8/16 Bit
1024 x 768	8/16 Bit	8/24 Bit	8/16/24 Bit
800 x 600	8/16/24 Bit	8/24 Bit	8/16/24 Bit
768 x 576	8/16/24 Bit	8/24 Bit	8/16/24 Bit
640 x 480	8/16/24 Bit	8/24 Bit	8/16/24 Bit
640 x 480*	8/16/24 Bit	8/24 Bit	8/16/24 Bit
768 x 576*	8/16/24 Bit	8/24 Bit	8/16/24 Bit

*PAL Video

q **Calibration (miroCRYSTAL 24S and 32S)**
The miroCRYSTAL 24S/32S board is equipped with special circuitry and connector for an optional calibration sensor. The CALIBRATION TOOL for miroPROOFSCREEN monitors permits precise color calibration and ensures the monitor's color consistency for years to come.

q **Multimedia**
miroCRYSTAL 16S/24S/32S has a video-compatible timing. With a video converter (like the miroVIDEO-Converter, available as an option) presentations can be shown on a TV or recorded on a VCR.

q **System configurations**
Now all miroCRYSTAL 16S/24S/32S graphics boards run in single-screen and multiscreen mode. Combined with a miroCRYSTAL 8S graphics board (which is available as an option) the miroCRYSTAL 16S/24S/32S can be operated in the dual-screen mode.

q **Drivers**

– *Windows driver*
miroCRYSTAL 16S/24S/32S's delivery scope includes drivers for Windows 3.1.

– *Autodesk drivers*
In additon, powerful CAD drivers are part of miroCRYSTAL 16S/24S/32S's delivery scope.

– *miroWINTOOLS*
miroWINTOOLS is a general term for a collection of tools that further increase productivity. The tools include: miroSCOPE (magnifying glass for Windows) and miroSUPERSCREEN (for configuring the Windows desk-
top).

2. Hardware Installation

Before You Start ...

System Configurations

miroCRYSTAL 16S/24S/32S can be operated in a single-, in the dual- and in the multiscreen configuration. The following table shows which miro graphics boards and which monitors are part of the individual system configurations:

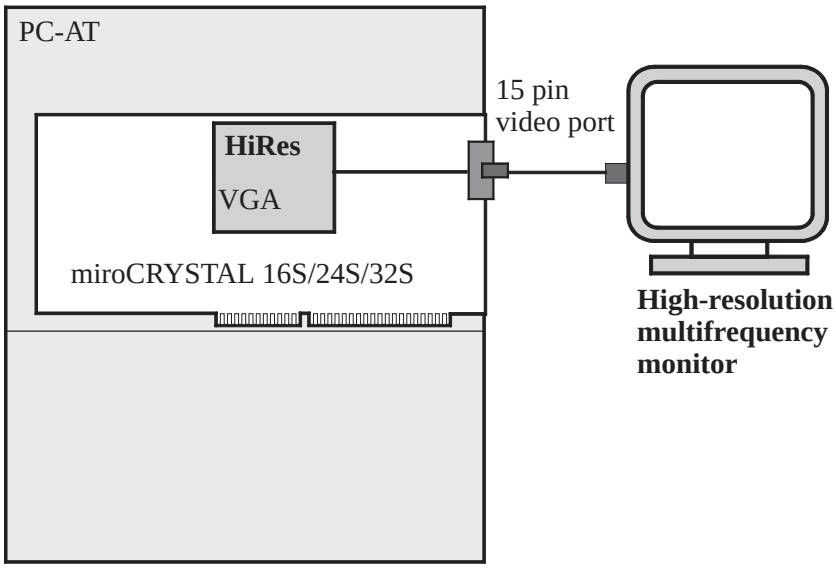
	Single-screen	Dual-screen	Multiscreen
miro graphics board(s)	1 x miroCRYSTAL 16S/24S/32S	1 x miroCRYSTAL 16S/24S/32S + 1 x miroCRYSTAL 8S/ISA* (in VGA mode)	2 x miroCRYSTAL 16S/24S/32S
			1 x miroCRYSTAL 16S/24S/32S + 1 x miroCRYSTAL 8S/ISA* (in high-resolution mode)
Monitor(s)	1 x high-resolution multifrequency monitor	1 x high-resolution multifrequency + 1 x standard VGA monitor	2 x high-resolution multifrequency monitors

* available asan option

The following text describes the system configurations in more detail.

Single-screen configuration

In this configuration one miroCRYSTAL 16S/24S/32S is connected to a single **multifrequency monitor**. The graphics chip includes a VGA: VGA and high-resolution images are displayed on this monitor. Switching beween VGA presentation and high-resolution graphics presentation modes is done automatically.

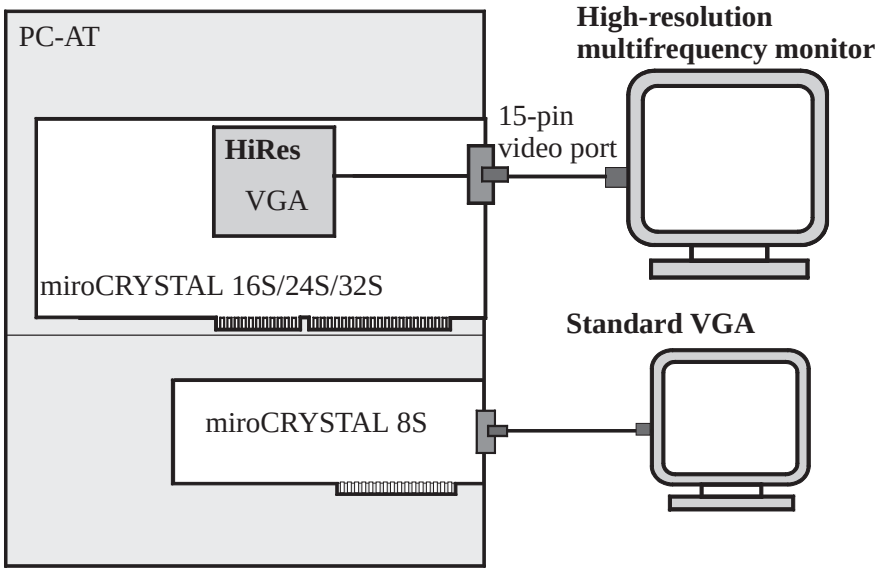


Single-screen configuration

Dual-screen configuration

In the dual-screen configuration a VGA system is operated in addition to the high-resolution graphics system (miroCRYSTAL 16S/24S/32S and high-resolution multifrequency monitor): Here miroCRYSTAL 8S runs in the VGA mode and is connected to a standard VGA monitor.

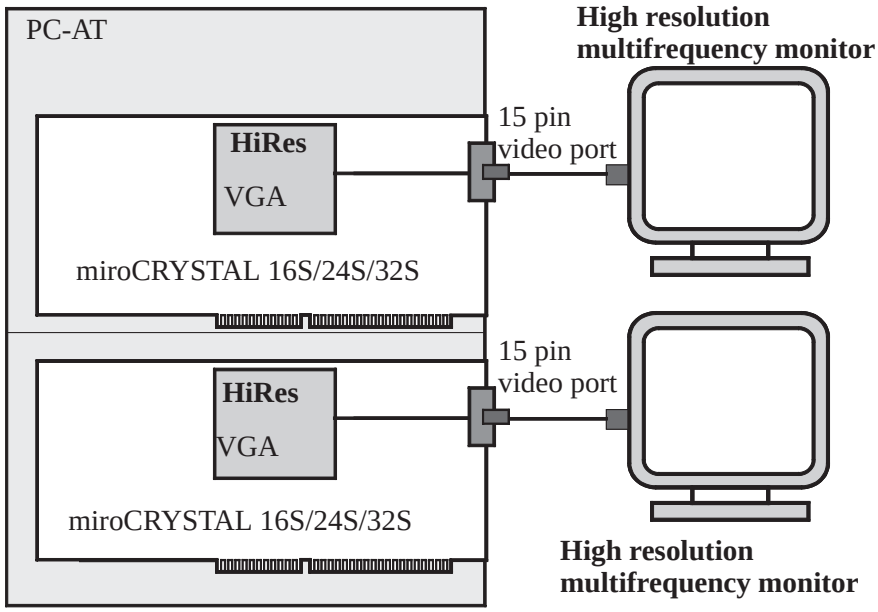
Since the VGA on the miroCRYSTAL 16S/24S/32S cannot be switched off, the dual-screen configuration is only possible with miroCRYSTAL 8S but not with a standard VGA.



Dual-screen configuration

Multiscreen configuration

In the multiscreen configuration two miroCRYSTAL 16S/24S/32S boards of the same bus type or one miroCRYSTAL 16S/24S/32S and one miroCRYSTAL 8S/ISA board have to be installed in one computer. Here miroCRYSTAL 8S runs in a high-resolution mode and is connected to a multifrequency monitor.



Multiscreen configuration

Please note: Some system configurations require changing the jumper setting on one of the boards installed. For more detailed information refer to the chapter «Installing the board(s)».

System Requirements

To install miroCRYSTAL 16S/24S/32S, your computer has to meet the following requirements:

Computer
miroCRYSTAL 16S (24S/32S)/ISA:
IBM AT or compatible computer with a free ISA slot;

miroCRYSTAL 16S (24S/32S)/EISA:
386, 486 PC or compatible computer with a free EISA slot;

miroCRYSTAL 16S (24S/32S)/VL:
386, 486 PC or compatible computer with a free VL slot (Local bus);

miroCRYSTAL 16S (24S/32S)/PCI:
486-, Pentium PC or compatible computer with a free PCI slot.

Monitor
For the single screen configuration:
High-resolution multifrequency monitor supporting a horizontal frequency of at least 48 kHz with separate horizontal and vertical syncs. To use all the

possibilities of your miroCRYSTAL 16S/24S/32S, you need a multifrequency monitor, which supports a vertical scan frequency of 64 kHz. miro offers monitors suitable (e. g. miroC2071).

For the dual-screen configuration:
High-resolution multifrequency monitor and a standard VGA monitor.

For the multiscreen configuration with a miroCRYSTAL 16S/24S/32S board and a miroCRYSTAL 8S:
A high-resolution multifrequency monitor and a monitor supported by miroCRYSTAL 8S (see «miroCRYSTAL 8S» Hardware Manual).

For the multiscreen configuration with two miroCRYSTAL 16S/24S/32S graphics boards:
Two high-resolution multifrequency monitors.

The miroCRYSTAL 16S/24S/32S Package

Before you begin the installation, please check to make sure your miroCRYSTAL 16S/24S/32S package is complete. The package contains:

– miroCRYSTAL 16S/24S/32S graphics board

– a set of disks

– documentation

– optional:
miroCRYSTAL 8S graphics board, monitor, shielded monitor cable, miroVIDEO-Converter

for miroCRYSTAL 24S and miroCRYSTAL 32S:
DTP package (hard- and software for the CALIBRATION TOOL)

If any parts are missing, please contact your dealer.

Settings

On your miroCRYSTAL 16S/24S/32S you will find a jumper (small plastic connector). For the exact location, please refer to the following illustrations.

The default setting for miroCRYSTAL 16S/24S/32S is the single-screen configuration.

Dual-screen/multiscreen configuration with one miroCRYSTAL 16S/24S/32S and one miroCRYSTAL 8S:
Before installing miroCRYSTAL 16S/24S/32S together with a miroCRYSTAL 8S, the jumper setting on the miroCRYSTAL 16S/24S/32S has to be changed. miroCRYSTAL 8S is automatically **board 1**. The computer boots on this board and the image appears first on the monitor connected to this board.

Multiscreen configuration with two miroCRYSTAL 16S/24S/32S boards: Before installing two miroCRYSTAL 16S/24S/32S boards the jumper has to be removed and reset on one board. The board where the jumper setting has been changed is automatically the **board 2**: The computer boots on **board 1** and the image appears first on the monitor connected to this board.

VGA in the computer

If a VGA is already installed it must be removed before the installation of the miroCRYSTAL 16S/24S/32S.

Address conflicts

miroCRYSTAL 16S/24S/32S is exceptionally reliable and avoiding address conflicts will insure a properly functioning system.

miroCRYSTAL 16S/24S/32S reserves the I/O address 073C8h for activation and deactivation. This address must not be used by other boards.

Before beginning with the installation make sure that the addresses occupied by miroCRYSTAL 16S/24S/32S are not also occupied by another expansion board in your computer. For detailed information on the address range used by miroCRYSTAL 16S/24S/32S, please refer to appendix A.

miroCRYSTAL 16S/24S/32S/EISA

If you want to install a miroCRYSTAL 16S/24S/32S/EISA board you can configure the EISA bus with the MIRO0928.CFG configuration file. Use the EISA Configuration Utility supplied with your computer for the configuration. For details check your computer's manual.

Electrostatic charge

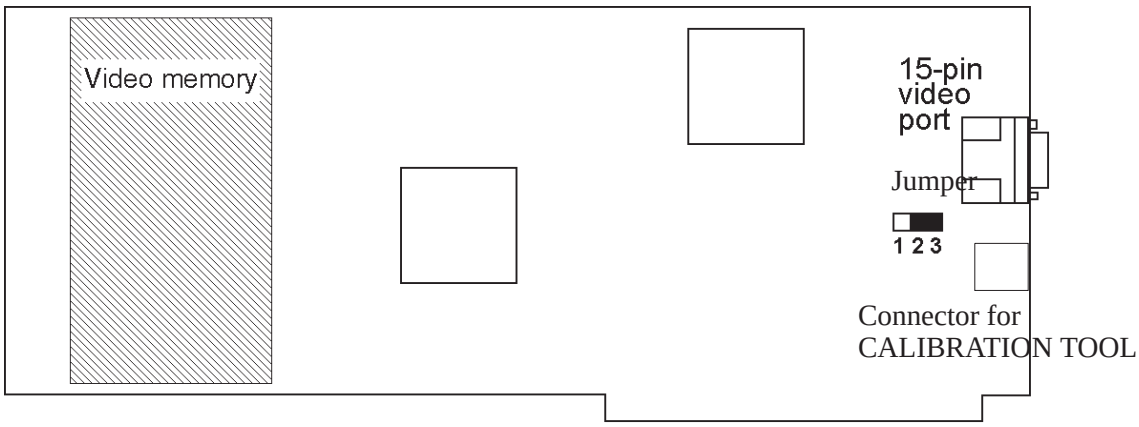
Graphics boards are very sensitive to electro-static charge. To avoid damage caused by electrostatic charges, do not remove the board from its antistatic packaging until you are actually ready to install it. Please save the bag for future transportation.

Installing the Board(s)

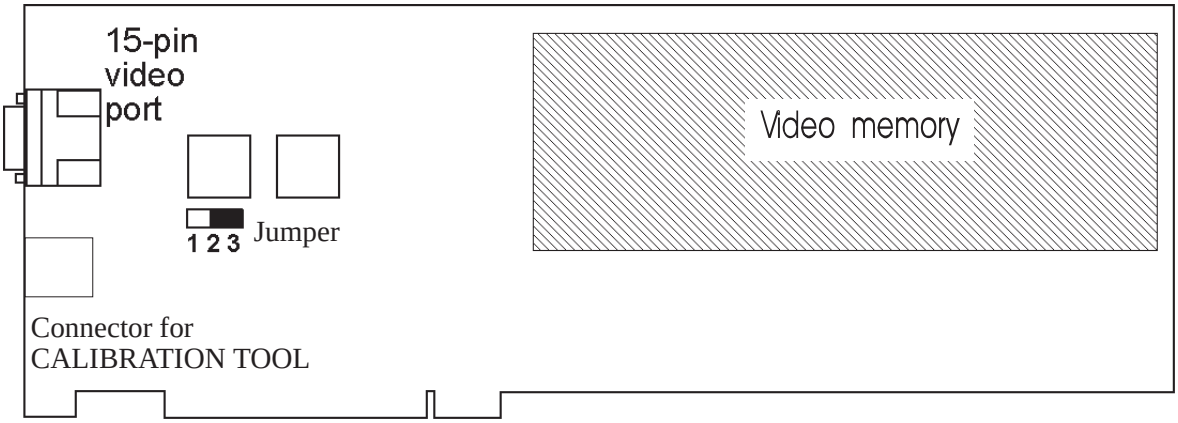
To install a miroCRYSTAL 16S/24S/32S and possibly a miroCRYSTAL 8S or an additional miroCRYSTAL 16S/24S/32S, proceed as follows:

Check/ change jumper setting

- Check the jumper setting on the miroCRYSTAL 16S/24S/32S board(s) and, if necessary, change the jumper setting. The jumpers are described in the following.



miroCRYSTAL 16S (24S/32S) ISA/EISA/VL (here miroCRYSTAL 24S)



miroCRYSTAL 16S (24S/32S) for PCI bus (here miroCRYSTAL 24S)

Single-screen configuration:
The jumper on the miroCRYSTAL 16S/24S/32S is factory-set for the single-screen configuration (see illustration below).

A. Single-screen configuration

Dual-/multiscreen configuration with one miroCRYSTAL 16S/24S/32S and one miroCRYSTAL 8S:
The jumper setting on the miroCRYSTAL 16S/24S/32S has to correspond to the following illustration.

B. Dual-/multiscreen configuration with miroCRYSTAL 8S

Multiscreen configuration with two miroCRYSTAL 16S/24S/32S boards:
The jumper on one board has to be set as shown in illustration B.

Hardware Installation

The only tool needed to install the graphics board is a screwdriver.

Proceed as follows:

- Turn off the computer and all peripheral devices connected to it. Disconnect the computer from the power supply and also disconnect all other cables.
- Loosen the screws of the computer's cover and remove the cover.
- Discharge yourself of a possible static charge by touching the power unit casing. Select a free ISA-, EISA-, VL or PCI slot (two slot's are required for multiscreen). Remove the slot's cover at the back of the computer. If necessary, loosen the screws of the cover and save it.
- Carefully insert the board in the slot by holding the card at the top and gently pushing both ends down into the slot at the same time. Press onto the upper edge of the board to make sure it sits securily in the slot.

Do not 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.

- *Dual-/multiscreen configuration:*
  Install the second miroCRYSTAL 16S/24S/32S as described above or install miroCRYSTAL 8S as described in the corresponding hardware manual.

Please note: miroCRYSTAL 8S has two jumpers and a DIP switch. These have to be set correctly before installing miroCRYSTAL 8S in your computer. For further information, refer to the «miroCRYSTAL 8S» Hardware Manual.

- Fasten the board's bracket to the back of the computer using the screw you saved from the shield.
- Put the cover back on the computer and reconnect the peripheral devices.

Connecting the monitor(s)

To connect the high resolution monitor with the graphics board, use a proper suitable shielded monitor cable.

- Disconnect the computer and the monitor from the power supply.
- Connect the BNC connectors of the video cable with the corresponding ports of the monitor (see table). Close the bayonet socket with a quarter turn to the right.

BNC plug of the cable	Monitor connector
red	VIDEO IN: R
green	VIDEO IN: G
blue	VIDEO IN: B
yellow	vert. sync.:V
black	horiz. sync.:H/HV

- Connect the 15-pin connector of the video cable coming from the high resolution monitor to the 15-pin video output of the miroCRYSTAL 16S/24S/32S board. Tighten the screws.

- *Dual-/multiscreen configuartion*
  Connect the second monitor to the second miroCRYSTAL 16S/24S/32S or the miroCRYSTAL 8S board.

CALIBRATION TOOL

Please note:
You can use the CALIBRATION TOOL for miroPROOFSCREEN only with the **miroCRYSTAL 24S** or **32S** graphics boards. Only these boards are provided with the necessary calibration logic and the necessary connector.

- For a detailed CALIBRATION TOOL description, refer to the CALIBRATION TOOL for miroPROOFSCREEN User's Manual.

- Reconnect the monitor(s) to the power supply.

3. Specifications

General

	VL	ISA	EISA	PCI
Bus width	32 Bit	16 Bit	32 Bit	32 Bit
Slot frequency	40 MHz	8,3 MHz	8,3 MHz	33 MHZ
Data transfer (max.)	66 MB/s (with 80486/33)	7 MB/s	33 MB/s	132 MB/s (with 80486/33)
Graphics processor	S3 86C928 (downwards compatible with S3 911); VGA integrated			
Video memory	2/3/4 MB			
Video timing	Horizontal scan frequeny: 35 kHz bis 85 kHz Vertical scan frequeny: 60 Hz bis 120 Hz Pixel frequeny: 25 MHz bis 130 MHz			
Power supply	+5V, max 2,3 A / +12V, max 0,01 A			
Options	Monitor, shielded monitor cable, miroVIDEO-Converter			

Video modes

miroCRYSTAL 16S:

Resolution (pixels)	Colors	Vertical scan frequency
1408 x 1024	256	67 - 70 Hz
1280 x 1024	256	59 - 75 Hz
1152 x 864	256	64 - 92 Hz
1024 x 768	256, 65,536	71 - 102 Hz
800 x 600	256, 65,536, 16.7 mill.	77 - 100 Hz
768 x 576	256, 65,536, 16.7 mill.	78 - 106 Hz
640 x 480	256, 65,536, 16.7 mill.	70 - 110 Hz
768 x 576, TV	256, 65,536, 16.7 mill.	TV compatibel
640 x 480, TV	256, 65,536, 16.7 mill.	TV compatibel

miroCRYSTAL 24S:

Resolution (pixels)	Colors	Vertical scan frequency
1024 x 768	256, 16.7 mill.	44 - 80 Hz
800 x 600	256, 16.7 mill.	58 - 100 Hz
768 x 576	256, 16.7 mill.	50 - 106 Hz
640 x 480	256, 16.7 mill.	70 - 110 Hz
768 x 576, TV	256, 16.7 mill.	TV compatibel
640 x 480, TV	256, 16.7 mill.	TV compatibel

miroCRYSTAL 32S:

Resolution (pixels)	Colors	Vertical scan frequency
1408 x 1024	256, 65,536	67 - 70 Hz
1280 x 1024	256, 65,536	59 - 75 Hz
1152 x 864	256, 65,536	70 - 92 Hz
1024 x 768	256, 65,536	78 - 102 Hz
1024 x 768	16,7 mill.	73 - 78 Hz
800 x 600	256, 65.536, 16,7 mill.	77 - 100 Hz
768 x 576	256, 65.536, 16,7 mill.	82 - 106 Hz
640 x 480	256, 65.536, 16,7 mill.	70 - 110 Hz
768 x 576, TV	256, 65.536, 16,7 mill.	TV compatibel
640 x 480, TV	256, 65.536, 16,7 mill.	TV compatibel

Appendix

Address Range

Avoiding address conflicts will allow your miroCRYSTAL 16S/24S/32S to run without problems. Make sure that the addresses used by miroCRYSTAL 16S/24S/32S are not also assigned to other components of your computer system.

– **I/O address**
  miroCRYSTAL 16S/24S/32S occupies the memory and adress range of standard VGA as well as parts of the 8514/A I/O Address range (x2E8h). These address ranges are normally not used by standard system hardware and address conflicts are unlikely to happen.

The following table shows the address areas for miroCRYSTAL 16S/24S/32S:

8514/A	VGA
0E2E8h	03B0H - 03DFh
0x2E8h*	073C8h
0x6E8h*	
0xAE8h*	
0xEE8h*	

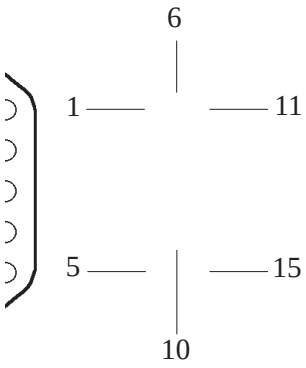
In addition to the adresses noted above, the following VGA addresses are used:

VGA-Bildspeicher	VGA-BIOS
0A0000h - 0BFFFFh	0C0000h - 0C7FFFh

15-pin Video Output

The miroCRYSTAL 16S/24S/32S board is equipped with a 15-pin D-type connector to connect the video cable to the monitor.

The following illustration and table shows the socket and corresponding pin assignment:



15-pin video output

Pin Nr.	Pin-Belegung
1	rot
2	grün
3	blau
4	nicht belegt
5	Masse
6	Masse
7	Masse
8	Masse
9	nicht belegt
10	Masse
11	nicht belegt
12	nicht belegt
13	HSync
14	VSync
15	nicht belegt