
miroCRYSTAL 10SD/20SD/20SV Hardware Manual



miroCRYSTAL 10SD/20SD/20SV

Hardware Manual

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VDOK-CRSD-000

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Contents

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

1. Overview 1

Features	1
System requirements	2
Delivery scope	2

2. Hardware installation 3

Hardware settings	3
miroCRYSTAL 10SD: Board layout	4
Setting jumpers and DIP switch on miroCRYSTAL 10SD	4
miroCRYSTAL 20SD: Board layout	6
Setting the jumper on miroCRYSTAL 20SD/VL	7
miroCRYSTAL 20VD: Board layout	7
Setting the jumper on miroCRYSTAL 20VD/VL	8
Installing miroCRYSTAL 10SD/20SD/20SV	9

3. Technical data 10

Appendix 12

Installing miroUPGRADE-KIT for miroCRYSTAL 10SD	12
Removing miroCRYSTAL 10SD	12
Upgrading and installing miroCRYSTAL 10SD	13
15-pin D-type video port	14
VESA Standard Feature Connector	15
miroCRYSTAL 10SD/20SD/20SV address range	16

Warranty Card



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.
- If you use a VGA monitor, this monitor must support a 35 kHz horizontal scan frequency. The horizontal scan frequency of a multifrequency monitor can range from 35 to 100 kHz. To use the **TrueColor mode** a multifrequency monitor is required.
- 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 10SD, the miroCRYSTAL 20SD and the miroCRYSTAL 20SV 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 quick installation chart provides a hardware and software installation overview.

Hardware

Hardware

1. Check the system requirements, make copies of the supplied disks.
2. If necessary, check and/or change the DIP switch and the jumper settings:
3. Open the computer.
4. Depending on its bus type install graphics board into the VL or PCI slot.
5. Connect the monitor.

Software

Software

6. Install miro drivers for miroCRYSTAL 10SD/20SD/20SV. The order of the installation is not obligatory.



miro•win (Windows)

The miro•win disks are needed.

Insert *miro•win High speed drivers for WIndows1/2* disk.

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

Depending on your disk drive enter **a:install** or **b:install**.

Follow the instructions given by the installation program.

If necessary, configure installed drivers.



miro•win (CAD)

The miro•win disks are needed.

Insert *miro•win High speed drivers for CAD 1/1* disk.

Depending on your disk drive enter **a:install** or **b:install**.

Follow the instructions given by the installation program.

If necessary, configure installed drivers.



miro•proof

The miro•proof disks are needed.

Insert desired *miro•proof* disk.

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

Depending on your disk drive enter **a:install** or **b:install**.

Follow the instructions given by the installation program.



miro•plus

The miro•plus disks are needed.

Insert desired *miro•plus* disk.

Install drivers and/or tools.

If necessary, configure installed drivers.

1. Overview

Features

With miroCRYSTAL 10SD, miroCRYSTAL 20SD and miroCRYSTAL 20SV, miro offers graphics boards, which were designed especially for professional use under Windows and DOS: The graphics boards meet all requirements concerning page layout, illustration and color image editing.

q **Graphics acceleration**

The operating speed of a graphics system is essential especially for professional purposes. The operating speed is determined by the graphics processor.

The miroCRYSTAL 10SD/20SD/20SV graphics boards are equipped with S3 graphics processors to improve the performance of applications running under Windows and DOS. miroCRYSTAL 10SD is equipped with the 86C805 graphics processor, miroCRYSTAL 20SD with the Vision864 graphics processor and miroCRYSTAL 20SV with the Vision964 graphics processor.

q **Video memory**

The miroCRYSTAL 10SD has 1 MB of High-Speed DRAM (upgradable to 2 MB), the miroCRYSTAL 20SD has 2 MB of High-Speed DRAM and the miroCRYSTAL 20SV has 2 MB of fast VRAM.

q **Fast bus systems**

There is a **V**(esa) **L**(ocal) bus version and a **P**(eripheral) **C**(omponent) **I**(nterconnect) version of the boards.

q **Drivers**

miroCRYSTAL 10SD/20SD/20SV includes all of the necessary drivers to achieve the maximum performance from your system. In addition, the miro tools are provided.

System requirements

To install miroCRYSTAL 10SD/20SD/20SV, your computer system has to meet the following requirements:

Computer

- for VL bus: a 386, 486, Pentium computer or compatible with a VL Local Bus slot
- for PCI bus: a 486 or Pentium computer or compatible with a PCI Local Bus slot.

Monitor

High-resolution multifrequency monitor supporting a horizontal scan frequency of at least 35 kHz with separate horizontal and vertical syncs. To receive all the benefits from miroCRYSTAL 20SD and miroCRYSTAL 20SV, you need a multifrequency monitor, which supports a vertical scan frequency of 64 kHz or more. miro offers suitable monitors.

Delivery scope

Before beginning the miroCRYSTAL 10SD/20SD/20SV installation, please make sure your miroCRYSTAL 10SD/20SD/20SV package is complete:

- Graphics board
- Installation disk(s)
- Documentation
- *optional*
Monitor, shielded monitor cable.



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

2. Hardware installation

Hardware settings

For some miro graphics boards presets can be realized by jumpers and DIP switches. Therefore, please refer to the board layouts on the following pages.

Presettings for miroCRYSTAL 10SD

VL/PCI

Before you start installing the *miroCRYSTAL 10SD* graphics board, make sure that the jumper and the DIP switch settings on the board are correct.

VGA

Any existing VGA board or a motherboard VGA has to be removed from the computer or be disabled.

Presettings for miroCRYSTAL 20SD

VL

Ensure the correct jumper settings on the *miroCRYSTAL 20SD/VL* graphics board.

PCI

The *miroCRYSTAL 20SD/PCI* graphics board does not have any jumpers. No settings are needed.

VGA

Before the installation, however, any existing VGA board or a motherboard VGA has to be removed from the computer or disabled.

Presettings for miroCRYSTAL 20SV

VL

Ensure the correct jumper settings on the *miroCRYSTAL 20SV/VL* graphics board.

PCI

The *miroCRYSTAL 20SV/PCI* graphics board does not have any jumpers. No settings are needed.

VGA

Before the installation, however, any existing VGA board or a motherboard VGA has to be removed from the computer or disabled.

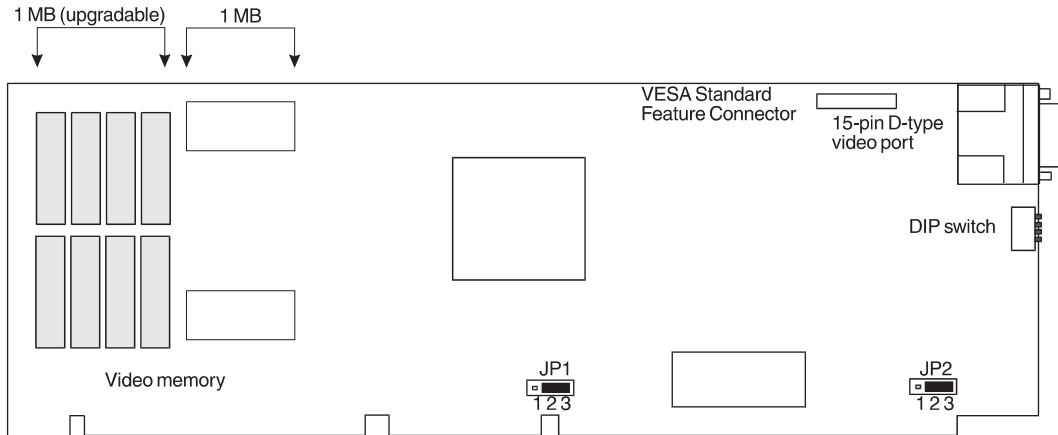


Do not install miroCRYSTAL 10SD/20SD/20SV without having checked and, if necessary changed, the presets.

miroCRYSTAL 10SD: Board layout

VL

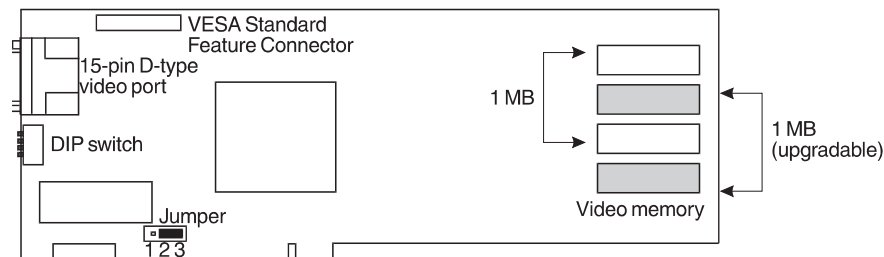
- Locate the DIP switch and the jumpers JP1 and JP2 on your miroCRYSTAL 10SD/VL.



miroCRYSTAL 10SD/VL

PCI

- Locate the DIP switch and the jumpers JP1 and JP2 on your miroCRYSTAL 10SD/PCI.

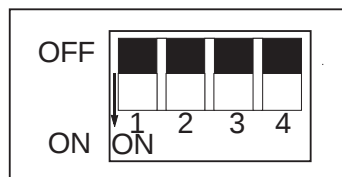


miroCRYSTAL 10SD/PCI

Setting jumpers and DIP switch on miroCRYSTAL 10SD

DIP switch

The DIP switch adjusts the miroCRYSTAL 10SD graphics board to your monitor. All switches are set at the factory to «OFF»: The graphics board is set to a 64 kHz monitor.



Default setting of the DIP switches

- Adjust the graphics board to your monitor. If you use a standard VGA monitor, select the switch position of a 35 kHz multifrequency monitor.

Switch Position				Monitor
1	2	3	4	
OFF	OFF	OFF	OFF	64-85 kHz multifrequency
ON	OFF	OFF	OFF	58 kHz multifrequency
OFF	ON	OFF	OFF	reserved *
ON	ON	OFF	OFF	reserved *
OFF	OFF	ON	OFF	48 kHz multifrequency
ON	OFF	ON	OFF	reserved *
OFF	ON	ON	OFF	reserved *
ON	ON	ON	OFF	35 kHz multifrequency

* For new resolutions



A wrong switch position can seriously damage your monitor. If you are in doubt about the correct setting, consult your monitor's manual.

Change the DIP switch setting only when the computer is **turned off**.

Jumpers

miroCRYSTAL 10SD/VL:

Jumper 2 is irrelevant for operating miroCRYSTAL 10SD. The factory setting should, however, not be changed.

Jumper 1 (JP 1) adjusts the miroCRYSTAL 10SD/VL board to the **VESA Local Bus** clock pulse of your computer. miroCRYSTAL 10SD/VL is factory-set to a clock pulse of ≤ 33 MHz (position 2-3).



Jumper position 2-3: Clock pulse ≤ 33 MHz

If the VESA Local Bus clock pulse is higher than 33 MHz, set the jumper to the 1-2 position.



Jumper position 1-2: Clock pulse > 33 MHz

- Check and, if necessary, change the jumper setting.

miroCRYSTAL 10SD/PCI:

By default, the jumper on miroCRYSTAL 10SD/PCI is set to the 2-3 position. This factory setting should not be changed.

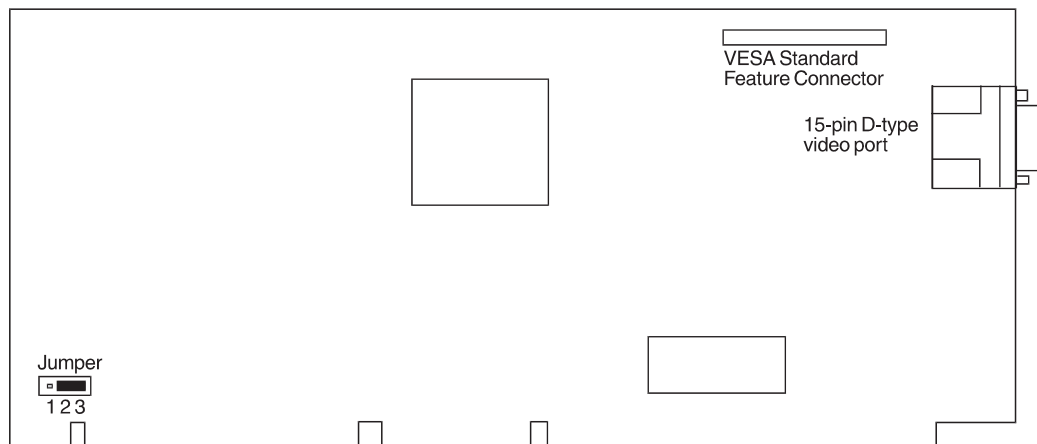


Jumper position 2-3

miroCRYSTAL 20SD: Board layout

VL

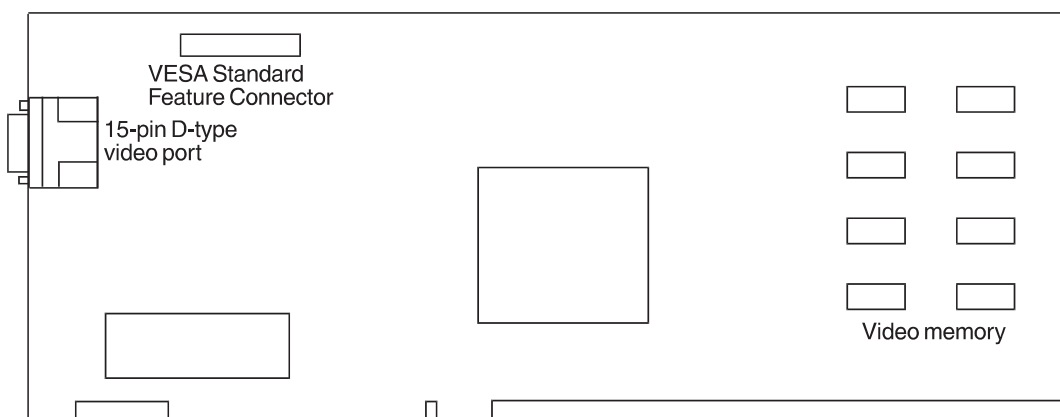
- Locate the jumper on the miroCRYSTAL 20SD/VL board.



miroCRYSTAL 20SD/VL

PCI

- The miroCRYSTAL 20SD/PCI board has no jumpers. Proceed with the section «Installing miroCRYSTAL 10SD/20SD/20SV».



miroCRYSTAL 20SD/PCI

Setting the jumper on miroCRYSTAL 20SD/VL

The jumper adjusts the miroCRYSTAL 20SD/VL board to the VESA Local Bus clock pulse of your computer.

miroCRYSTAL 20SD/VL is set to the clock pulse ≤ 33 MHz: position 2-3.



Jumper position 2-3

If the VESA Local Bus clock pulse is higher than 33 MHz, set the jumper to position 1-2.



Jumper position 1-2

- Check and, if necessary, change the jumper setting.

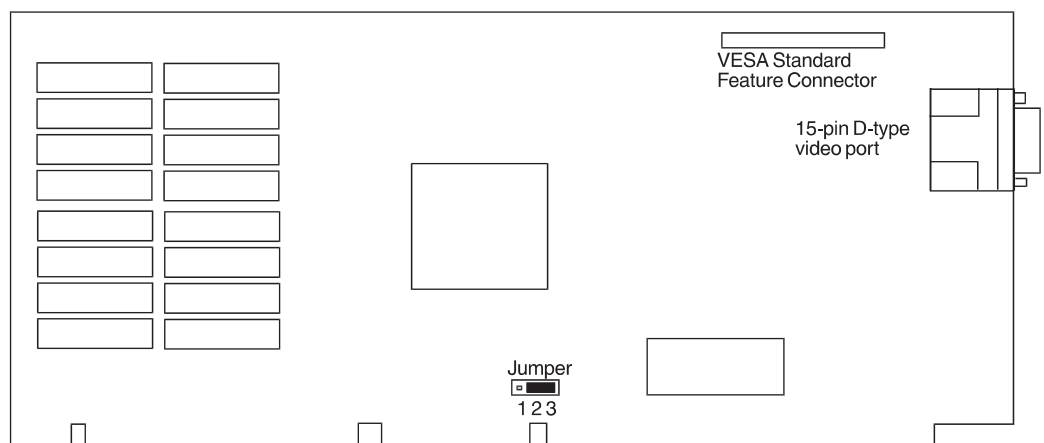


You should be very cautious when changing the setting of the jumpers. An incorrect setting may lead to the malfunction of the graphics board and computer. Therefore you should **always** consult the manual of your computer.

miroCRYSTAL 20SV: Board layout

VL

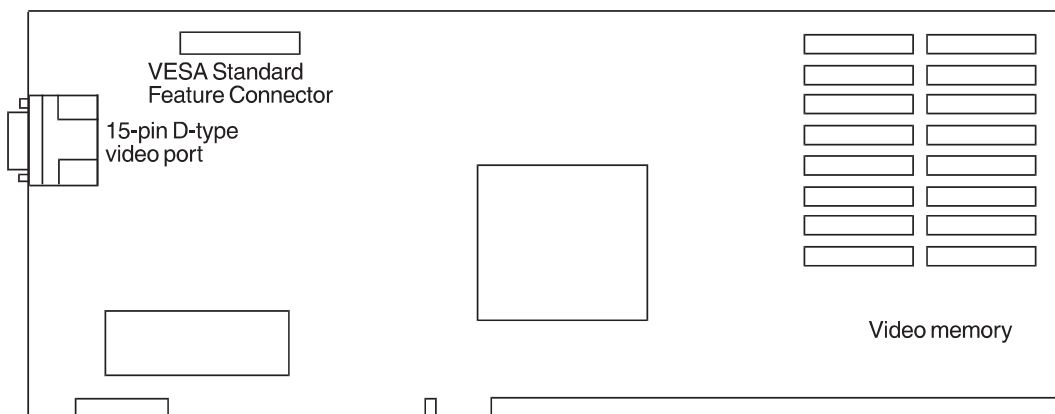
- Locate the jumper on the miroCRYSTAL 20SV/VL board.



miroCRYSTAL 20SV/VL

PCI

- The miroCRYSTAL 20SV/PCI board has no jumpers. Proceed with the section «Installing miroCRYSTAL 10SD/20SV/20SV».



miroCRYSTAL 20SV/PCI

Setting the jumper on miroCRYSTAL 20SV/VL

The jumper adjusts the miroCRYSTAL 20SV/VL board to the VESA Local Bus clock pulse of your computer.

miroCRYSTAL 20SV/VL is set to the clock pulse $\leq 33\text{MHz}$: position 2-3.



Jumper position 2-3

If the VESA Local Bus clock pulse is higher than 33 MHz, set the jumper to position 1-2.



Jumper position 1-2

- Check and, if necessary, change the jumper setting.



You should be very cautious when changing the setting of the jumpers. An incorrect setting may lead to the malfunction of the graphics board and computer. Therefore you should **always** consult the manual of your computer.

Installing miroCRYSTAL 10SD/20SD/20SV

After checking and/or changing hardware settings you can install the graphics board. 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 other components.
- Loosen the screws of the computer's cover and remove it.
- Discharge yourself of static charge by touching the power unit casing.
- If necessary, remove the VGA board from the computer or disable the motherboard VGA.
- According to your graphics board select a free VL or PCI slot. Remove the slot's cover at the back of the computer. Save the screws of the cover.
- Depending on the bus type, carefully insert the graphics board into the VL or 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 monitor documentation.
- Reconnect the computer and the monitor to the power supply.

How to go on?

After you have installed your graphics board, you can proceed with the software installation and with the installation and configuration of the application drivers.

For a detailed description of the miro drivers and miro tools please refer to the corresponding Software Manuals.



3. Technical data

Bus system

- miroCRYSTAL 10SD/20SD/20SV for VESA Local Bus:
VESA Local Bus
- miroCRYSTAL 10SD/20SD/20SV for PCI Local Bus:
PCI Local Bus

Compatibility

- VGA register-compatible
- CGA register-compatible
- HGC register-compatible
- MDA register-compatible

Graphics processor

miroCRYSTAL 10SD

- S3 P86C805 for VESA Local Bus
50 MHz clock frequency
- S3 P86C805 für PCI Local Bus
33 MHz clock frequency

miroCRYSTAL 20SD

- S3 VISION 864 for VESA Local Bus
50 MHz clock frequency
- S3 VISION 864 for PCI Local Bus
33 MHz clock frequency

miroCRYSTAL 20SV

- S3 VISION 964 for VESA Local Bus
50 MHz clock frequency
- S3 VISION 964 for PCI Local Bus
33 MHz clock frequency

Video memory

- miroCRYSTAL 10SD
1 MB DRAM
- miroCRYSTAL 20SD
2 MB DRAM
- miroCRYSTAL 20SV
2 MB VRAM

Power supply

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

Video modes

Resolution	Maximum horizontal scan rate					
	100 kHz	85 kHz	64 kHz	58 kHz	48 kHz	35 kHz
1408 x 1024	70 Hz	70 Hz	–	–	–	–
1280 x 1024	75 Hz	75 Hz	60 Hz	45 Hz i	45 Hz i	–
1152 x 864	94 Hz	90 Hz	70 Hz	–	–	–
1024 x 768	100 Hz	100 Hz	75 Hz	70 Hz	60 Hz	43 Hz i
800 x 600	100 Hz	100 Hz	77 Hz	77 Hz	77 Hz	56 Hz
768 x 576	100 Hz	100 Hz	100 Hz	75 Hz i	80 Hz i	60 Hz
640 x 480	100 Hz	100 Hz	100 Hz	89 Hz	89 Hz	70 Hz

i = This resolution is only possible in the interlaced mode.

Some resolutions are not available for miroCRYSTAL 10SD (1 MB).

Video timings

- Horizontal scan frequency:
31 kHz to 100 kHz, depending on operating mode
- Vertical scan frequency:
60 Hz to 100 Hz, non interlaced, depending on operating mode
- Pixel frequency:
25 MHz to 110 MHz, depending on operating mode (miroCRYSTAL 10SD)
14.75 MHz to 135 MHz, depending on operating mode (miroCRYSTAL 20SD)
14.75 MHz to 135 MHz, depending on operating mode (miroCRYSTAL 20SV)

Options

- Monitor, shielded monitor cable
- miroUPGRADE-KIT (*only miroCRYSTAL 10SD*)

Appendix

Installing miroUPGRADE-KIT for mi-roCRYSTAL 10SD

The optional miroUPGRADE KIT allows you to easily upgrade the mi-roCRYSTAL 10SD from 1MB to 2 MB. After you have upgraded the video memory, you can take advantage of all the video modes a miroCRY-STAL 10SD board offers.

miroCRY-STAL 10SD/VL

The miroUPGRADE KIT for miroCRYSTAL 10SD/VL consists of eight 256K x 4 High-Speed-DRAMs with **only 45/50 ns**, which are inserted in the free sockets.

miroCRY-STAL 10SD/PCI

The miroUPGRADE KIT for miroCRYSTAL 10SD/PCI consists of two High-Speed-DRAMs with 512 KB each, which are inserted in the free sok-kets.

For the location of the video memory on your miroCRYSTAL 10SD/VL, please refer to the board layout on page 3.

For the location of the video memory on your miroCRYSTAL 10SD/PCI, please refer to the board layout on page 4.

Removing miroCRYSTAL 10SD

- If you have already installed the miroCRYSTAL 10SD in your compu-ter, you have to remove it for upgrading the graphics board.
- Power off your computer and all peripheral devices.
- Disconnect the computer from the power supply and also disconnect all other cables.
- Loosen the screws of the computer's cover and remove it.
- Discharge yourself of static charge by touching the power unit casing.
- Remove the cover of the miroCRYSTAL 10SD at the back of the compu-ter. Save the screws.
- Remove the graphics board **carefully** from the slot!

Upgrading and installing miroCRYSTAL 10SD

- Remove the High-Speed-DRAMs from the packaging.



Make sure to align the upgrade components in a line with the memory components already installed. For this purpose, memory components have a small crescent-shaped gap, a round depression or a bevelled edge.

- Align the memory components on the board in a line with the components already installed and insert the memory components carefully into the free sockets.



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

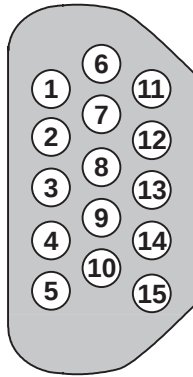
- Reinstall the miroCRYSTAL 10SD as described in the chapter «Installing miroCRYSTAL 10SD».
- Install and reconfigure the application drivers

For the detailed description of the miro drivers and miro tools, please refer to the corresponding Software Manuals.

15-pin D-type video port

The miroCRYSTAL 10SD/20SD/20SV graphics board is equipped with a 15-pin D-type connector to which the video cable attaches. The other end of the video cable connects to the monitor.

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



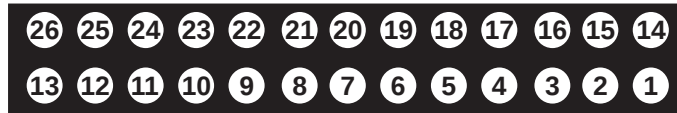
15-pin D-type connector

Pin No.	Pin Allocation
1	Red
2	Green
3	Blue
4	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

VESA Standard Feature Connector

The miroCRYSTAL 10SD/20SD/20SV graphics board can be used together with a video overlay board. Therefore 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	Clock
10	Reserved
11	HSync
12	VSynC
13	Ground
14	Ground
15	Ground
16	Ground
17	Enabling signal
18	Enabling signal
19	Enabling signal
20	Free
21	Ground
22	Ground
23	Ground
24	Ground
25	Free
26	Free



The pin allocation of the VESA Standard Feature Connector has been adjusted for all *miroCRYSTAL* 10SD/20SD/20SV *PCI* boards, so that these boards can be connected 1:1 to another graphics board via a flat ribbon cable.

miroCRYSTAL 10SD/20SD/20SV address range

For the miroCRYSTAL 10SD/20SD/20SV graphics board to run without problems you have to avoid address conflicts. Make sure that the addresses used by miroCRYSTAL 10SD/20SD/20SV are not also assigned to other components of your computer system.

– I/O address range

miroCRYSTAL 10SD/20SD/20SV occupies the address range of standard VGA **03B0h-03DFh** and parts of the 8514/A I/O address range.

These address ranges are normally not used by standard system hardware and therefore address conflicts are unlikely to happen.

The following table shows the I/O address areas that can be selected and used by miroCRYSTAL 10SD/20SD/20SV.

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
