

miroMAGIC S4/miroRAINBOW Win
Hardware Manual



This miro manual is printed on chlorine-free paper.

miroMAGIC S4

miroRAINBOW Win

Hardware Manual



miroMAGIC S4/miroRAINBOW Win.

Version 1.0 October 1993

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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 64 kHz.

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About the manual

This hardware manual explains how to install the miroMAGIC S4 and the miroRAINBOW Win graphics boards. The quick installation chart overleaf gives you an overview about the hardware and software installation. To ensure the correct hardware installation and above all the correct jumper settings, refer to the detailed explanations in this manual.

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.

miroMAGIC S4:

Hardware

1. Check the system requirements, make copies of the supplied disks.
2. Check and/or change jumper and DIP switch settings.
 - ↳ *Single-screen configuration with miroMAGIC S4:*
Set jumper on miroMAGIC S4.
 - ↳ *Dual-/multiscreen configuration with one miroMAGIC S4 and one miroCRYSTAL 8S:*
Check jumper setting on miroMAGIC S4.
Set jumper and DIP switch on miroCRYSTAL 8S.
 - ↳ *Multiscreen configuration with two miroMAGIC S4:*
Set jumper on one miroMAGIC S4.
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 miroMAGIC S4. The order of installation (CAD and Windows) is not obligatory.
 - ↳ *CAD:*
You need the *miroCAD Power Disk 1* and the *miroCAD Disk 1*.
Insert *miroCAD Power 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.
 - ↳ *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....*
Depending 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.



miroRAINBOW Win:

Hardware

1. Check the system requirements, make copies of the supplied disks.
2. Check and/or change jumper and DIP switch settings.
 - ⇒ *Single-screen configuration with miroRAINBOW Win:*
Check factory-set jumper setting on miroRAINBOW Win.
 - ⇒ *Dual-/multiscreen configuration with miroRAINBOW Win and miroCRYSTAL 8S:*
Set jumper on miroRAINBOW Win.
Set jumper and DIP switch on miroCRYSTAL 8S.
 - ⇒ *Multiscreen configuration with two miroRAINBOW Win:*
Set jumper on one miroRAINBOW Win.
Check factory-set jumper setting on second miroRAINBOW Win.
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 for miroRAINBOW Win. The order of installation (Windows and CAD) is not obligatory. To install the CALIBRATION software Windows has to be installed.
 - ⇒ *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:*
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.



1. Introduction

miroMAGIC S4 is a powerful graphics board for professional CAD and Windows users. **miroRAINBOW Win** is especially designed for professional publishing under Windows and meets all demands of layout, illustration and color image editing. There are four miroMAGIC S4 and miroRAINBOW Win models: the ISA, EISA, VL and PCI bus version.

The miroMAGIC S4 and miroRAINBOW Win graphics boards offer the following features:

q **Graphics accelerator**

The S3 86C928 graphics processor was especially developed for the acceleration of Windows and CAD applications. Graphics jobs typical for Windows such as 2D and 3D applications run much faster.

q **Resolutions/Colors**

miroMAGIC S4 and miroRAINBOW Win offer a resolution of 1600 x 1200 pixels and 256 colors with a refresh rate of 70 Hz, a resolution of 1408 x 1024 pixels with 65536 colors and a refresh rate of 70 Hz and a resolution of 1024 x 768 pixels and 16.7 million colors with 75 Hz.

q **Dual-/multiscreen configuration**

The miroMAGIC S4 and miroRAINBOW Win graphics boards run in the single-screen, the dual-screen as well as in the multiscreen configuration. The hardware allows to run two miroMAGIC S4/miroRAINBOW Win boards or one miroMAGIC S4/miroRAINBOW Win board and one miroCRYSTAL 8S/ISA board in one computer. Thus, the miroTWINFACE driver doubles the workspace.

q **Calibration**

miroMAGIC S4/miroRAINBOW Win is equipped with a special circuitry and a connector for the optional calibration sensor as standard. The CALIBRATION TOOL permits precise color calibration and insures the monitors color consistency for years to come.

q **Multimedia**

miroMAGIC S4/miroRAINBOW Win has video-compatible timing. With the help of a video encoder (like the miroVIDEO-Converter, available as an option) presentations can be shown on a TV or recorded on a VCR.



q **Drivers for miroMAGIC S4**

Driver for **AutoCAD 12 under DOS** and **Windows** including **miro3D-VIEWER**:

The delivery scope of miroMAGIC S4 includes among others the miroGTI 12 and miroGTI 12 Win displaylist drivers and the miro3D-VIEWER. The miro3D-VIEWER imports three-dimensional AutoCAD drawings in a window where the drawings can be displayed using different shading techniques (Rendering).

miroGTI 12 under DOS and the large amount of memory of miroMAGIC S4 allows **Double Buffering**, in other words two complete pages can be stored in the display memory simultaneously. While one image is computed, another image can be displayed. Advantage: flickerfree zooming and panning.

q **Drivers for miroRAINBOW Win**

The miroRAINBOW Win delivery scope includes the **CALIBRATION TOOL software** and powerful Windows and CAD drivers.

q **miroWINTOOLS**

miroWINTOOLS is a collection of tools increasing productivity further, such as miroSCOPE (magnifying glass for Windows) and miroSUPERSCREEN (Windows desktop configuration).

2. Hardware installation

Before you start...

System configurations

miroMAGIC S4/miroRAINBOW Win run in the single-, 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 miroMAGIC S4	1 x miroMAGIC S4 + 1 x miroCRYSTAL 8S/ISA (in VGA mode)	2 x miroMAGIC S4
	1 x miroRAINBOW Win	1 x miroRAINBOW Win + 1 x miroCRYSTAL 8S/ISA (in VGA mode)	2 x miroRAINBOW Win
			1 x miroMAGIC S4 + 1 x miroCRYSTAL 8S/ISA (in high-resolution mode)
			1 x miroRAINBOW Win + 1 x miroCRYSTAL 8S/ISA (in high-resolution mode)
Monitor(s)	1 x high-resolution multifrequency monitor	1 x high-resolution multifrequency + 1 standard VGA fixed-frequency monitor	2 x high-resolution multifrequency monitors

The following text describes the system configurations in more detail.

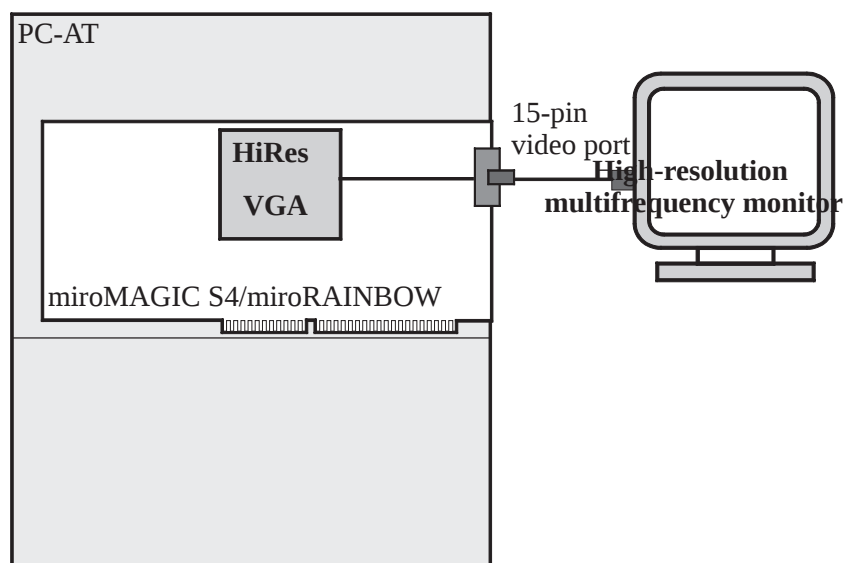
Single-screen configuration

In this configuration miroMAGIC S4/miroRAINBOW Win is connected to a **multifrequency monitor**. The graphics chip includes a VGA: The VGA image as well as the high-resolution image are displayed on this monitor. Switching between the VGA image and the high-resolution image is done automatically.





Please note that in the single-screen configuration the jumper setting on the miroMAGIC S4 has to be changed (see pages 9/10).

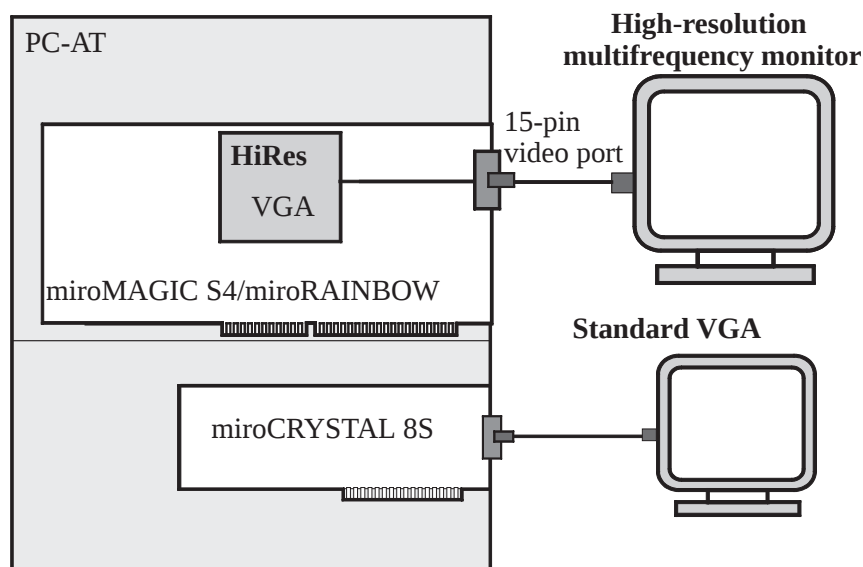


Single-screen configuration

Dual-screen configuration

In the dual-screen configuration a VGA system is operated in addition to the high-resolution graphics system (miroMAGIC S4/miroRAINBOW Win and high-resolution multifrequency monitor): Here miroCRYSTAL 8S runs in the VGA mode and is connected to a standard VGA fixed-frequency monitor.

Since the VGA on the miroMAGIC S4/miroRAINBOW Win cannot be switched off, the dual-screen configuration is only possible with miroCRYSTAL 8S but not with a standard VGA.



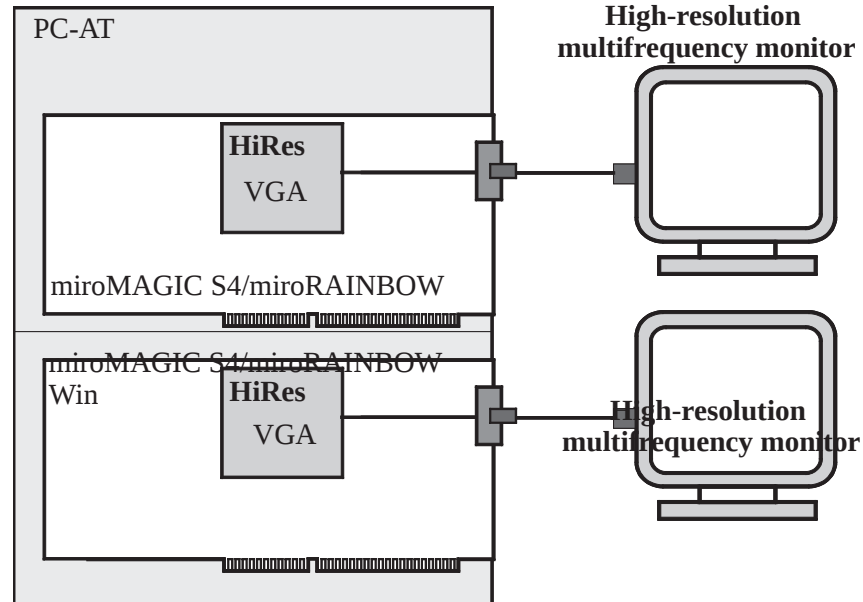
Dual-screen configuration



Please note that in the dual-screen configuration the jumper setting on the miroRAINBOW Win has to be changed.

Multiscreen configuration

In the multiscreen configuration two miroMAGIC S4/miroRAINBOW Win boards of the same bus type or one miroMAGIC S4/miroRAINBOW Win 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 that in the multiscreen configuration with two miroMAGIC S4/miroRAINBOW Win boards the jumper setting has to be changed on one board.

System requirements

To install miroMAGIC S4/miroRAINBOW Win, your system has to meet the following requirements:

Computer

for miroMAGIC S4/ISA; miroRAINBOW Win/ISA

286, 386, 486, Pentium or compatible computer with a free ISA or EISA bus slot;

for miroMAGIC S4/EISA; miroRAINBOW Win/EISA:

386, 486, Pentium or compatible computer with a free EISA bus slot;

for miroMAGIC S4/VL; miroRAINBOW Win/VL:

486, Pentium or compatible computer with a free VL Local Bus (VL) slot;

for miroMAGIC S4/PCI/miroRAINBOW Win/PCI:

486, Pentium or compatible computer with a free PCI slot.





Monitor

For the single-screen configuration:

High-resolution multifrequency monitor supporting a horizontal scan frequency of 31 to at least 64 kHz with separate inputs for the horizontal and vertical syncs (e.g. 5 x BNC).

For the dual-screen configuration:

High-resolution multifrequency monitor and a standard VGA fixed-frequency monitor.

For the multiscreen configuration with a miroMAGIC S4/miroRAINBOW Win board and a miroCRYSTAL 8S board:

A high-resolution multifrequency monitor and a monitor supported by miroCRYSTAL 8S (see «miroCRYSTAL 8S» Hardware Manual).

For the multiscreen configuration with two miroMAGIC S4/miroRAINBOW Win boards:

Two high-resolution multifrequency monitors.

Graphics boards for the multiscreen configuration:

Two miroMAGIC S4/miroRAINBOW Win boards of the same bus type (e.g. 2 x miroMAGIC S4/ISA or 2 x miroRAINBOW Win/VL) or one miroMAGIC S4/miroRAINBOW Win board and one miroCRYSTAL 8S/ISA.

Delivery scope

Before installing the miro graphics board(s) make sure your system is complete.

miroMAGIC S4:

- miroMAGIC S4 graphics board
- miroCRYSTAL 8S graphics board
- Disk set 3,5"
- Documentation
- *Optional:* Monitor, shielded monitor cable, miroVIDEO-Converter

miroRAINBOW Win:

- miroRAINBOW Win graphics board
- Disk set 3,5"
- Documentation

Optional: Monitor, shielded monitor cable, miroVIDEO-Converter

If any parts are missing, please consult your dealer.



Presettings

On the boards, there is a jumper field. For the exact location, refer to the illustrations on page 9.

Single-screen configuration with miroMAGIC S4:

miroMAGIC S4 is factory-preset as **board 2** for the multiscreen configuration. To operate the graphics board in the single-screen configuration, change the jumper setting on miroMAGIC S4 prior to the installation.

Single-screen configuration with miroRAINBOW Win:

miroRAINBOW Win is factory-preset as **board 1** for the multiscreen configuration. To operate the graphics board in the single-screen configuration, check the factory-set jumper setting.

Dual-screen/multiscreen configuration with one miroMAGIC S4 and one miroCRYSTAL 8S:

Before installing miroMAGIC S4 together with a miroCRYSTAL 8S, the jumper setting on the miroMAGIC S4 does not have to be changed. miroCRYSTAL 8S is automatically board 1.

Dual-screen/multiscreen configuration with one miroRAINBOW Win and one miroCRYSTAL 8S:

Before installing miroRAINBOW Win together with a miroCRYSTAL 8S, change the jumper setting on miroRAINBOW Win. miroCRYSTAL 8S is automatically board 1.



Please note: There is one jumper and a DIP switch on miroCRYSTAL 8S. These have to be set correctly before installing miroCRYSTAL 8S. Please refer to the «miroCRYSTAL 8S» Hardware Manual.

Multiscreen configuration with two miroMAGIC S4 boards:

Before installing two miroMAGIC S4 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 1**: The computer boots on this board and the image appears first on the monitor connected to this board. For further information, refer to page 9.

Multiscreen configuration with two miroRAINBOW Win boards:

Before installing two miroRAINBOW Win 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. For further information, refer to page 9.

VGA in the computer

The graphics chip on miroMAGIC S4/miroRAINBOW Win has an integrated VGA component. Therefore an already present motherboard VGA has to be deactivated prior to the installation of the miro board. A VGA board already installed must be removed.

Address conflicts

To make sure your system can operate perfectly, address conflicts must be avoided!

For activating/deactivating, the miroMAGIC S4 board uses the I/O address 73C8h. This address must not be used by other boards.



Before you begin with the installation make sure that the addresses occupied by the miro graphics boards are not occupied by other expansion boards in your computer.

For detailed information on the address range used by miroMAGIC S4/mi-roRAINBOW Win, refer to the appendix.

miroMAGIC S4/EISA; miroRAINBOW Win/EISA

To install an EISA board in a computer you may configure the EISA bus for your miro board. You find the required configuration file **MIRO0928.CFG** on the installation disk. Use the EISA Configuration Utility supplied with your computer for the configuration. For details check your computer's manual.

Installing the board(s)

To install a miroMAGIC S4/miroRAINBOW Win and possibly a miroCRYSTAL 8S or an additional miroMAGIC S4/miroRAINBOW Win, proceed as follows:

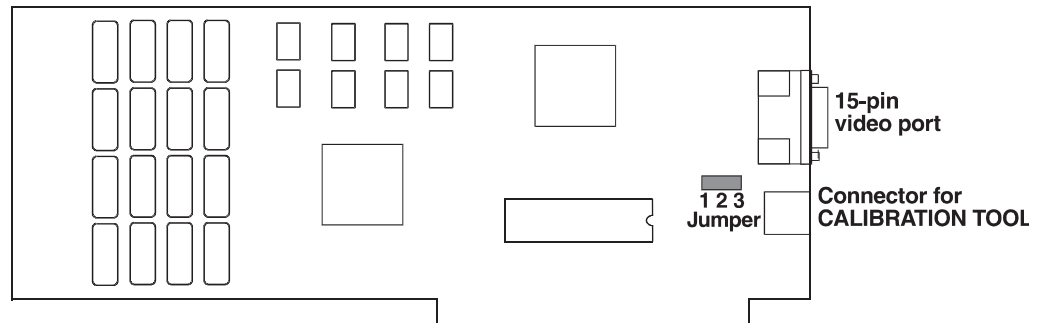
Check/change jumper setting

- Check the jumper setting on the miroMAGIC S4/miroRAINBOW Win board(s) and, if necessary, change the jumper setting. The jumpers are described in the following.



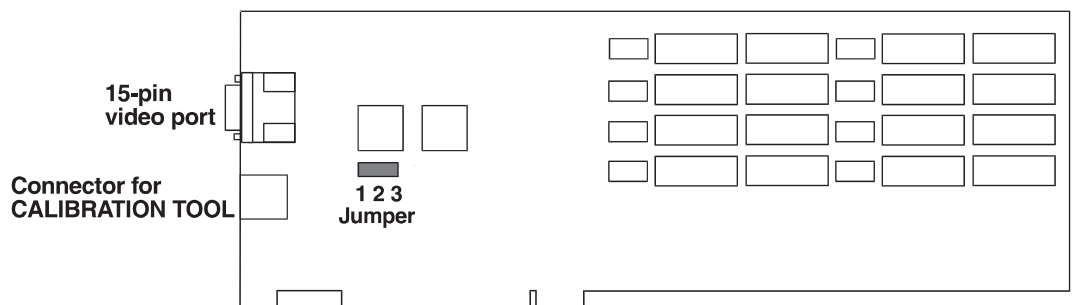
The illustrations below show the board layout of miroMAGIC S4/ISA/EISA/VL and miroRAINBOW Win/ISA/EISA/VL and miroMAGIC S4/PCI and miroRAINBOW Win/PCI.

Board layout of miroMAGIC S4/ISA/EISA/VL and miroRAINBOW Win/ISA/EISA/VL



miroMAGIC S4/ISA/EISA/VL; miroRAINBOW Win/ISA/EISA/VL

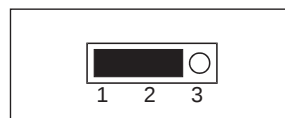
Board layout of miroMAGIC S4/PCI and miroRAINBOW Win/PCI



miroMAGIC S4/PCI; miroRAINBOW Win/PCI

Factory-setting: miroMAGIC S4

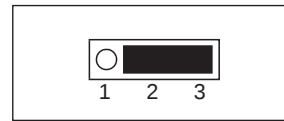
miroMAGIC S4 is configured by the factory-setting as **board 2**. The following illustration shows the factory setting.



*Factory setting:
miroMAGIC S4*

Factory-setting: miroRAINBOW Win

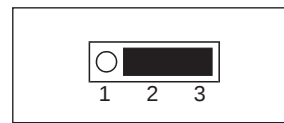
miroRAINBOW Win is configured by the factory-setting as **board 1**. The following illustration shows the factory setting.



*Factory setting:
miroRAINBOW Win*

Single-screen configuration:

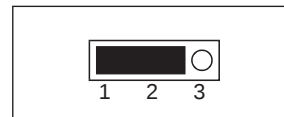
To use miroMAGIC S4/miroRAINBOW Win in the single-screen configuration, set the jumper as is shown in the following illustration.



*A. Single-screen
configuration*

Dual-/multiscreen configuration with one miroMAGIC S4/miroRAINBOW Win and one miroCRYSTAL 8S:

To use miroMAGIC S4/miroRAINBOW Win in the dual-screen or in the multiscreen configuration with miroCRYSTAL 8S, the jumper setting on the miroMAGIC S4/miroRAINBOW Win has to correspond to the following illustration.



*B. Dual-/multiscreen
configuration with mi-
roCRYSTAL 8S*

Multiscreen configuration with two miroMAGIC S4/miroRAINBOW Win boards:

To use two miroMAGIC S4/miroRAINBOW Win boards in one computer, the jumper on one board has to be set as shown in illustration A. Then, this board is **board 1**. The other board has to be configured as shown in illustration B. Then, this board is **board 2**. Read also the chapter «Presettings».

Installing the board(s)

The only tool you need to install the graphics boards is a screwdriver. Proceed as follows:

- Turn off your computer and all connected peripheral devices. Disconnect the computer from the power supply and disconnect all other cables.



- Loosen the screws of the computer's cover and remove the cover.
- Discharge yourself of possible static charge by touching the power unit casing. Select a free ISA-, EISA-, VL, or PCI slot. Remove the slot's cover at the back of the computer. If necessary, loosen the screws of the cover and keep them.
- Carefully insert the board into the slot by holding it at the top and by gently pushing both ends down into the slot at the same time. Press onto the board's upper edge to make sure it is securely 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.

- *Dual-, multiscreen configuration:*
Install the second miroMAGIC S4/miroRAINBOW Win as described above or install miroCRYSTAL 8S as described in the corresponding hardware manual.



Please note: miroCRYSTAL 8S has one jumper 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.
- Put the cover back on the computer.

Connecting the monitor(s)

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

- Connect the 15-pin connector of the video cable to the 15-pin video output of the miroMAGIC S4/miroRAINBOW Win board. Tighten the screws.
- Connect the BNC connectors of the video cable to the corresponding monitor inputs (see table). Close the bayonet socket with a quarter turn to the right.

BNC connector	Monitor inputs
red	VIDEO IN: R
green	VIDEO IN: G
blue	VIDEO IN: B
yellow	V
black	H

- *Dual-, multiscreen configuration:*
Connect the second monitor to the second miroMAGIC S4/miroRAINBOW Win or the miroCRYSTAL 8S board (see «miroCRYSTAL 8S» Hardware Manual).

CALIBRATION TOOL

The CALIBRATION TOOL installation is described in detail in the «CALIBRATION TOOL User's Manual».

- Reconnect all other cables.

How to go on?

After installing the hardware you can install the software. For information on how to proceed read the «Quick installation chart» at the beginning of this manual.



3. Technical data

Graphics processor

- S3 86C928 (downwards compatible with S3 911)
- VGA integrated

Video modes

Resolution (pixels)	Colors	Vertical scan frequency
2048 x 1024 virtual	256	60 - 80 Hz
1600 x 1200	256	approx. 70 Hz
1408 x 1024	256	60 - 75 Hz
1408 x 1024	65536	60 - 70 Hz
1280 x 1024	256, 65536	60 - 75 Hz
1152 x 864	256, 65536	60 - 95 Hz
1152 x 864	16.7 million	60 - 62 Hz
1024 x 768	256, 65536	60 - 100 Hz
1024 x 768	16.7 million	60 - 75 Hz
768 x 576	16.7 million	TV, 60 - 100 Hz
640 x 480	16.7 million	TV, 60 - 100 Hz

Video timings

- Horizontal scan frequency:
31 kHz - 85 kHz
- Vertical scan frequency:
50 Hz - 120 Hz
- Pixel frequency:
25 MHz - 170 MHz

Video memory

- 4 MByte VRAM

Bus system

- **miroMAGIC/ISA; miroRAINBOW Win/ISA:**
ISA AT bus
16-bit data bus
Slot frequency 8.3 MHz
max. 7 MB/s data transfer
- **miroMAGIC S4/EISA; miroRAINBOW Win/EISA:**
EISA bus
32-bit data bus
Slot frequency 8.3 MHz
max. 33 MB/s data transfer
- **miroMAGIC S4/VL; miroRAINBOW Win/VL:**
VL (VESA Local Bus)
32-bit data bus
Slot frequency max. 40 MHz
max. 66 MB/s data transfer
- **miroMAGIC S4/PCI; miroRAINBOW Win/PCI:**
PCI Local Bus
32-bit data bus
Slot frequency 33 MHz
max. 132 MB/s data transfer

Power supply

- +5V, max. 2.3 A
- +12V, max. 0.01 A

Options

- Monitor, shielded video cable
- miroVIDEO-Converter

Appendix

Address Range

If you want your miroMAGIC S4/miroRAINBOW Win to run without problems you have to avoid address conflicts; that is, make sure that the addresses used by miroMAGIC S4/miroRAINBOW Win are not also assigned to other components of your computer system.

- I/O address range
miroMAGIC S4/miroRAINBOW Win occupy the memory and address range of a 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; therefore address conflicts are unlikely to happen.

The following table shows the addresses:

8514/A	VGA
0E2E8h	03B0h - 03DFh
0x2E8h*	073C8h
0x6E8h*	
0xAE8h*	
0xEE8h*	

* x = 4/8/9/A/B

The following VGA addresses are used in addition to the addresses given above:

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

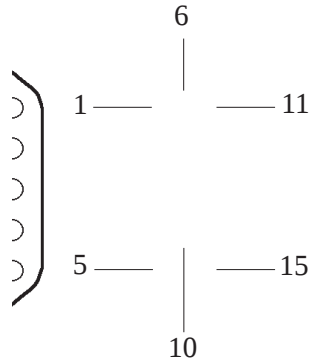
The miroMAGIC S4/miroRAINBOW Win addresses cannot be changed. In case of address conflicts in the I/O or the memory area, please change the address on the other expansion board.



15-pin video port

The miroMAGIC S4/miroRAINBOW Win board is equipped with a 15-pin D-type connector to which you connect the video cable to the monitor.

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



15-pin video port

Pin no.	Assignment
1	red
2	green
3	blue
4	free
5	ground
6	ground
7	ground
8	ground
9	free
10	ground
11	free
12	free
13	HSync
14	VSync
15	free

