
Basic Manual



miroTIGER.

Basic Manual.

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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:

- 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.
- If you want to use the miroTIGER onboard VGA be sure to remove a VGA present in the host system **before** beginning to install the miroTIGER board. Disable any VGA integrated on the motherboard.
- Make sure that the monitors you want to connect are in compliance with the graphics board's characteristics!
In the single screen configuration: high resolution multi frequency monitor, that supports a horizontal frequency of 31.5 to at least 64 kHz.
In the dual screen configuration: high resolution monitor, that supports a horizontal frequency of 64 to 78 kHz and a VGA monitor (31.5 kHz horizontal frequency for standard VGA, 35 kHz horizontal frequency for the 800 x 600 resolution).
If you want to use **Windows 3.x in True Color Mode** you always need a high resolution multi frequency monitor.
- Connect the high resolution monitor with the port labelled **HR!** Connect the VGA monitor with the port labelled **VGA!** Only use the shielded video cable!
- If in doubt consult your authorized dealer!



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About the Manuals

The printed miroTIGER system documentation consists of two parts: The **Basic Manual** and the **Application Manual**.

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 miroTIGER board.

In the **Application Manual** you learn everything you need to know about the installation and use of the driver software supplied with your miroTIGER board.

Manual structure

The manual consists of the following chapters:

- **Chapter 1 Introduction** provides a short overview of the miroTIGER board and its performance characteristics.
- **Chapter 2 miroTIGER Hardware** describes the system prerequisites, the configuration variations and the installation of the graphics board.
- **Chapter 3 miroTIGER Software** tells you how to install the TIGA interface and how to use the supplied utilities.
- **Chapter 4 Specifications** contains the specifications of the miroTIGER boards.
- The **Appendices** contain tables and lists with additional information.

Conventions

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

If a certain text passage only applies to the **miroTIGER 8** and the **miroTIGER 12** board, you will find this ideogram on the left in the margin.





The symbol on the left appears in the margin if a text passage is only valid for the **miroTIGER 8** board.



Important text passages 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 Reference

This quick reference is **not** intended to take place of the detailed user documentation elsewhere in this manual. However, the quick reference will give you an overview about the basic installation procedures.

Action	Further Information
• Check system requirements and DIP switch of the miroTIGER board!	Chapter 2: miroTIGER Hardware Appendix A: Address assignment
• Switch off computer and disconnect it from power, if necessary deactivate VGA in the computer, install miroTIGER board in the computer!	Chapter 2: miroTIGER Hardware
• Connect high resolution monitor with the HR port of the miro TIGER board! If necessary connect VGA monitor with the VGA port of the miroTIGER board!	Chapter 2: miroTIGER Hardware
• Make backup copy of the disks supplied, start the installation program from the disk by entering install< >, choose Install driver: TIGA follow the instructions on the screen!	Chapter 3: miroTIGER Software
• Install application driver!	see miroTIGER Application Manual



Chapter 1: Introduction

miroTIGER is a high resolution graphics board which, combined with a large-screen monitor, makes a professional graphics sub system for PC/AT computers. Use miroTIGER everywhere top graphics performance is a must: when working with CAD programs as well as graphical interfaces such as Windows 3.

miroTIGER comes in three versions:

miroTIGER 4, miroTIGER 8 and miroTIGER 12.

All models offer the following:

- TMS34020-40 MHz graphics processor
- with a resolution of 1280 x 1024 pixels 65,536 colors simultaneously
- with a resolution of 1024 x 768 pixels 16.7 million colors (True Color) simultaneously
- 4 MByte VRAM
- onboard displaylist

In addition, miroTIGER 8 has 4 MByte DRAM and miroTIGER 12 8 MByte for onboard displaylist.

Hardware

The miroTIGER hardware gets its power from state-of-the-art technology:

q **High-performance graphics processor**

The miroTIGER graphics board is equipped with the graphics processor **TMS34020**, a programmable 32-bit processor, especially developed for graphics applications. Graphics operations such as drawing a line or circle don't have to take a detour via the CPU which isn't really equipped to handle such special tasks, instead they are computed on the graphics board directly. This



reduces the work load of the PC's main processor considerably. The high clock rate of 40 MHz adds even more speed.

q **Graphics standard interface TIGA-340**

TIGA (Texas Instruments Graphics Architecture) is a software interface developed for graphics boards on the basis of the TMS340x0 processors. TIGA makes the most out of the graphics boards' features: Being able to directly access the instruction set of the TMS34020 assures optimal communications between the PC and the graphics board.

q **Double Buffering**

Thanks to the generous amount of memory you can take advantage of double buffering, in other words two pages with 1280 x 1024 pixels each can be stored in the display memory simultaneously. The inactive part of the display memory redraws the second picture in the background. This way you can switch between the two pictures in a split second. The advantage is clear: a redraw without any delay or flicker!

q **VGA on board**

The integrated VGA realizes a single or dual screen solution with only *one* graphics board. This makes it possible to boot your computer and work with DOS programs in VGA mode without a second graphics board. The integrated miroTIGER VGA offers a top resolution of 800 x 600 pixels with 16 colors, and it can be turned off.

Software

Your miroTIGER board's delivery scope includes driver software for Windows 3 and Autodesk programs:

q **miroGTI4: Display list driver for AutoCAD**

Special about this driver is the fact that the components necessary for working on a drawing are saved as vectors in a so-called display list. The display list is calculated directly on the graphics board, making the display output even faster. Depending on the size of the picture, the display list may become quite large, therefore the



miroGTI has a clever memory management. Also, AutoCAD's function scope is extended by several new functions.

q **miroGTI12: Displaylist driver for AutoCAD 12**

miroGTI12 is a driver developed by miro especially for AutoCAD 12. miroGTI12 is compatible with the Autodesk Device Interface (ADI) version 4.2 and processes 32-bit entries in the displaylist. Furthermore, it offers numerous new functions and supplementary applications.

q **Windows drivers**

The drivers for **Windows 3.0** and **Windows 3.1** take advantage of what the miroTIGER hardware has to offer and thus give you first-class display quality at resolutions up to 1280 x 1024 pixels. In addition, miroTIGER allows for a "**True Color mode**". You get True Color quality with resolutions up to 1024 x 768. Each pixel can take on any color from a palette of 16.7 million so that graphics the quality of color prints appear on your monitor.

Complete system

miro offers fine-tuned, optimized graphics systems, consisting of a graphics board and monitor; together they form the complete solution. Only monitors that match the miroTIGER boards 100% were chosen. To assure perfect displays, miro adjusts each monitor exactly to the graphics board.





Chapter 2: miroTIGER Hardware

1. Before you start ...

System requirements

Before you begin to install your miroTIGER graphics board, make sure your system meets the following requirements:

1. IBM AT or 100% compatible computer with a free 16-bit slot or EISA bus
2. a monitor with separate horizontal and vertical syncs:
 - **In the single screen configuration:** a high resolution **multifrequency monitor** that can handle horizontal frequencies from 31.5 to 64 (or 71 or 78) kHz, such as the miroC2071.
 - **In the dual screen configuration:** a high resolution fixed or multifrequency monitor which can process a horizontal frequency in the area of 64 to 78 kHz such as the miroC2078.

If you are working with the dual screen solution and want to connect a monitor to the miroTIGER board's VGA port, you will need a VGA monitor. In the standard VGA resolution (up to 640 x 480 pixels) the monitor must be able to handle a horizontal frequency of 31.5 kHz, in the 800 x 600 resolution it must be 35 kHz.
 - **Windows 3 in True Color mode:** Here you will *always*, in both the single and dual screen solution, need a high resolution multifrequency monitor.



Delivery scope

Before you begin the installation check to make sure your miroTIGER package is complete. This is what should be included:

- miroTIGER graphics board
- a set of disks
- documentation

Options

- 4 MByte Memory Upgrade Kit (only for miroTIGER 4)
- 8 MByte Memory Upgrade Kit (only for miroTIGER 4)
- VIDEO CONVERTER
- miroHIGHRISC
- Video cable HR5

If anything is missing, contact your authorized dealer.

Default settings

On the board you find a 12fold DIP switch. The settings of the switch determine the defaults of your miroTIGER board.

To ensure flawless functioning of your miroTIGER system make sure the switches are set correctly **before** you begin to install the board. For details, refer to Section 2 “DIP Switch”!

+ VGA in the computer

A VGA component is integrated on the miroTIGER board. Given certain circumstances (if for example the miroTIGER board is run in a single screen configuration) you have to deactivate an already present motherboard VGA before you begin to install the miroTIGER board. An already installed VGA board must be removed. For more details check the sections “DIP Switch” and “System Configurations”.

Cache memory

If you have a 80486 computer that uses secondary cache (also known as second level cache) the mapped memory area C000h - DFFFh occupied by the miroTIGER board has to be excluded from caching. In this case make sure the



memory area you choose for miroTIGER is in the C or D segment. For further information, refer to appendix A and the computer's User's Manual.

**Static
energy**

Graphics boards are sensitive to electrostatic energy. To avoid damages caused by static charges, leave the miroTIGER board in its anti-static bag until you are ready to install it. Save the bag for future transports.

**EISA configuration
file**

If you want to use your miroTIGER board in a computer with an EISA bus, you can configure this bus for your board. You will find the configuration file you need for this **!TIG0100.CFG** on the installation disk. Use the EISA configuration program supplied with your computer for the configuration. For details, refer to the manual of your computer.

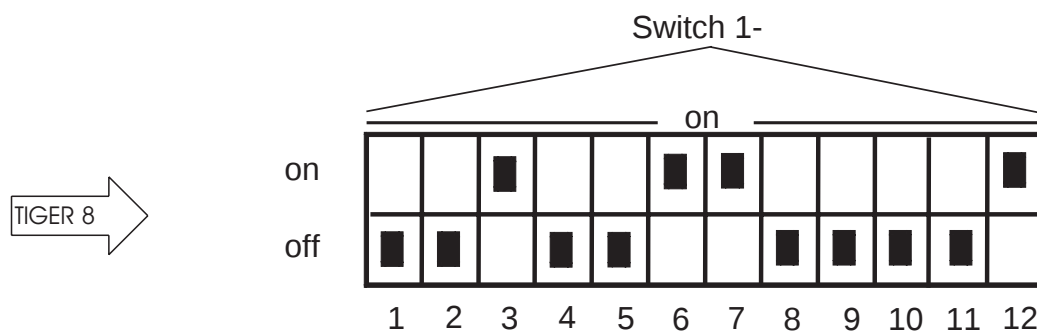
Tools

The only tool you will need to do the installation is a screwdriver.

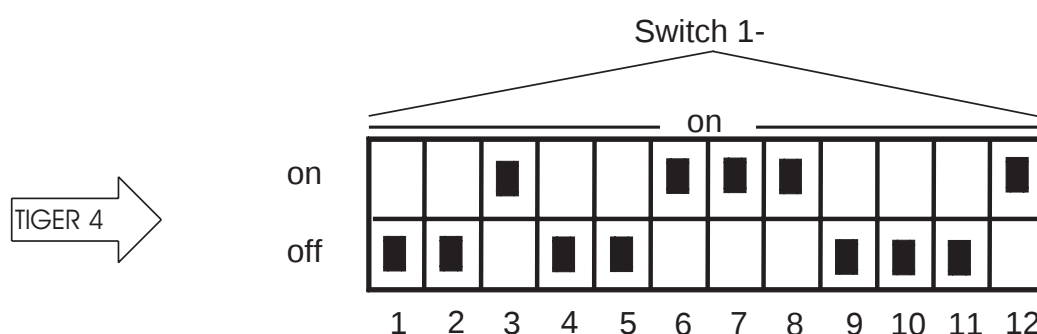


2. DIP Switch

The settings of the 12fold DIP switch determine important standard settings for the miroTIGER boards. The following illustration shows the miroTIGER boards' settings done at the factory. The default of the switch 1-8 of the miroTIGER 8 and miroTIGER 4 are **not** identical.



*DIP switch of the **miroTIGER 8** board*



*DIP switch of the **miroTIGER 4** board*

Switch 1-1 to 1-7

The miroTIGER boards occupy an **I/O address range** of 8 Byte; its base address depends on how the switches 1-1 to 1-7 are set. The base address' default is **360h**.

If other components of your hardware also occupy the I/O address the miroTIGER board is set to, a bus conflict will be the result. In this case your miroTIGER board won't function, and your hardware might be damaged.



Check your system before you start the installation to see whether there might be an address conflict. If necessary, change the I/O address of the miroTIGER board or that of the hardware component.

The table below gives an overview of the address ranges the miroTIGER boards can be set to and the corresponding switch settings:

Address range	Switch 1-						
	1	2	3	4	5	6	7
300h - 307h	off	off	on	on	on	on	on
308h - 30Fh	off	off	on	on	on	on	off
310h - 317h	off	off	on	on	on	off	on
340h - 347h	off	off	on	off	on	on	on
360h - 367h	off	off	on	off	off	on	on
380h - 387h	off	off	off	on	on	on	on
3A0h - 3A7h	off	off	off	on	off	on	on
3E0h - 3E7h	off	off	off	off	off	on	on

Switch 1-8

The setting of the switch 1-8 depends on whether the board has program memory (DRAM as SIMM). Note the following:

- **on**: there is no SIMM in the expansion slot.
This applies to the miroTIGER 4 board.
- **off**: a SIMM is in the expansion slot.
This applies to the miroTIGER 8 and the miroTIGER 12 board and the miroTIGER 4 board which has been upgraded.

Switches 1-9 to 1-10

These switches are reserved. You should not change the settings performed at the factory.



Switch 1-11

The setting of switch 1-11 depends on the system configuration. Is the miroTIGER VGA active (see DIP switch 1-12) and do you work in a single or dual screen configuration? This means:

- **on**: the miroTIGER VGA is active and you work in a dual screen configuration.
- **off**: the miroTIGER VGA is active and you work in a single screen configuration.

If the miroTIGER VGA is off the setting of the DIP switch 1-11 has no significance. The switch can be set to on or off.

Switch 1-12

Depending on how the switch 1-12 is set, the onboard VGA of the miroTIGER is either turned on or off. Note the following:

- **on** (default): miroTIGER VGA is on.
- **off**: miroTIGER VGA is off.

Important: Only *one* VGA may be active in your computer, either the miroTIGER VGA *or* another VGA logic (be it another VGA board or an onboard VGA integrated on the motherboard.)

+

This means:

- If the VGA integrated on the miroTIGER board is active (DIP switch 1-12 is set to **on**) another VGA present must be removed. A VGA integrated on the motherboard must be deactivated.
- In the reverse, when you are working in a dual- screen configuration and want to use a VGA present in your computer or an onboard one integrated on the motherboard, you have to deactivate the miroTIGER VGA (set the DIP switch 1-12 to **off**).



3. System Configurations

The miroTIGER boards can be run in the classic dual screen configuration as well as the single screen configuration.

+

In either case your system must have only **one** active VGA! The VGA you do not want to work with must be deactivated. You turn off the VGA of the miroTIGER board with the DIP switch 1-12 (see above).

Dual screen configuration

In the dual screen solution the high resolution graphics of the miroTIGER board is run in addition to the standard display system. Each system has its own monitor.

As an alternative to the configuration shown in the illustration

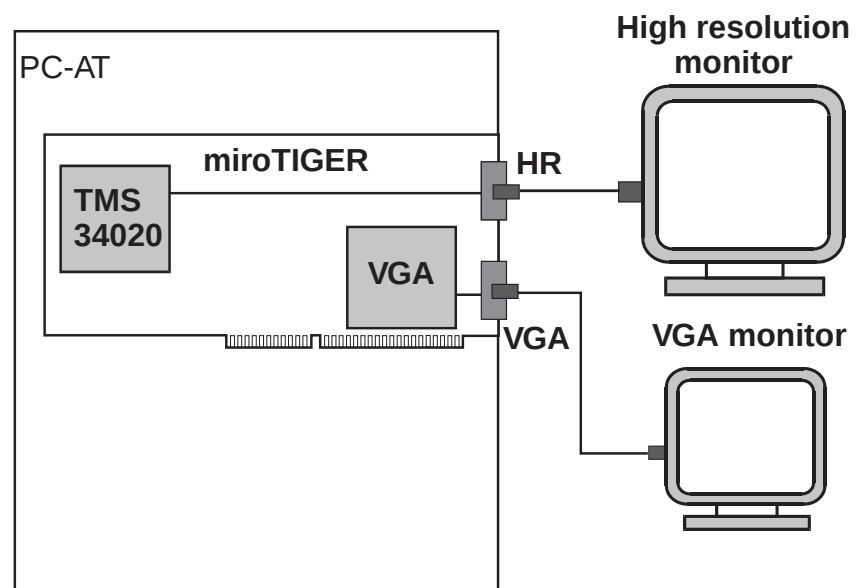


Fig. 2-1:

miroTIGER: Dual screen configuration

tion you can use - instead of the miroTIGER VGA - another VGA board or an onboard VGA integrated on the motherboard. In this case you have to deactivate the miroTIGER VGA.

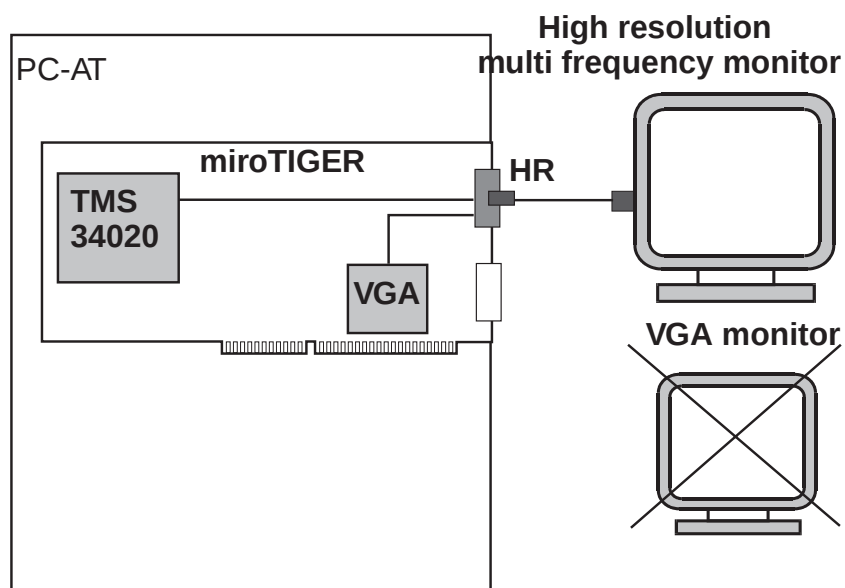


+

If you want to use your graphics system in a dual screen configuration with an activated miroTIGER VGA the DIP switch 1-11 has to be set to **on** (see above).

Single screen configuration

In the single screen configuration the miroTIGER works with a **multi frequency monitor**. The VGA picture created by the miroTIGER VGA is looped through to the monitor automatically, you do not need to hook up any extra cables. The VGA picture and the high-resolution graphics are shown on the monitor connected to the miroTIGER.



miroTIGER: Single screen configuration

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Please note: In the single screen configuration you must have a multi frequency monitor.

Do not, under any circumstances, use a fixed frequency monitor with the miroTIGER board.

The single screen configuration only works with the on-board VGA of the miroTIGER board.

If you want to use your graphics system in a single screen configuration with an activated miroTIGER VGA the DIP switch 1-11 has to be set to **off** (see above).

4. Details about the Installation

Insert the board

Read the following section to find out about how to insert the miroTIGER board in your computer.

- Turn off the computer and all peripheral devices connected to it. Disconnect all power and connecting cables (monitor, keyboard, printer, etc.).
- Loosen the screws of the lid and remove it. Save the screws.
- Touch the power unit casing to remove any static charge.

You should not move away from your workplace now, otherwise you might accumulate another electrostatic charge. If necessary, touch the power unit casing again.

- Select a free 16-bit slot for your miroTIGER board. Remove the slot's cover shield on the back of the PC. If necessary, loosen the screw on the shield and save it.



Please make sure that the SIMMs on miroTIGER 8 and miroTIGER 12 do not touch any other boards!

If your computer is equipped with a special slot for a memory expansion board, you cannot use this slot for the miroTIGER board.



- Hold the board at its top and carefully insert it into the slot. Make sure that the board's connector is properly seated in the slot.



On no account should you attempt to use force when inserting the board! If the board does not fit properly, remove it and make sure that the contacts on the motherboard have not been bent. Try inserting the board again.

- Fasten the board's bracket to the back of the computer using the screw you saved from the shield.



- Reassemble the computer cover and reconnect the peripheral devices.

Connecting the monitor

+

When you connect the monitor or monitors (in the dual screen solution), please pay attention to the following:

Both miroTIGER boards have two 15-pin ports as video connectors. They cannot be used interchangeably and therefore must not be mixed up!

- The port labelled **HR** is to be used with the **high resolution monitor**. Do not connect a VGA monitor to it!
- A **VGA monitor** may only be connected to the port labelled **VGA**.
- To connect the high resolution monitor with the graphics board use a proper, shielded cable, one that can handle frequencies up to 135 MHz, such as the miro Video cable HR5.

+

Follow these steps to connect the monitor:

- Disconnect the computer and monitor from power.
- Connect the 15-pin connector of the video cable coming from the high resolution monitor to the 15-pin port of the miroTIGER board. Tighten the screws on the plug.
- Connect the red, green, and blue BNC connectors with the **VIDEO IN** ports of the monitor, the ones labelled **R**, **G**, and **B**. Connect the yellow BNC connector with the port labelled **V**, and the black one to the port marked **H/HV**.
- Take the power cable and reconnect your monitor to the power supply.

Only use the power cable that came with the monitor. Do not use any cable that would supply the monitor with power via the computer, since the computer's power components are not always made to be able to handle a high-resolution monitor's power supply.



- **Only in the dual screen configuration:**

If you are using the miroTIGER onboard VGA in the dual screen configuration, connect the 15-pin connector of the VGA cable to the 15-pin port of the miroTIGER board labelled **VGA**. Tighten the screws on the plug.

Installation test

As soon as you finish the installation you can start your computer with the miroTIGER system and check whether your computer is able to boot. If you do run into a problem check the Appendix for possible causes and suggestions to remedy the situation.

What's next?

After you successfully installed the hardware you can go on to install the miroTIGER software as explained in Chapter 3.





Chapter 3: miroTIGER Software

1. Overview

You will find the following software on the disks that came with miroTIGER:

- TIGA, the software interface for your miroTIGER board
- driver for several programs
- utilities such as miroMODE
- the installation program you need to install the programs mentioned above

This chapter of the Basic Manual explains how to work with the installation program. It also tells you how to use TIGA and miroMODE.

The installation and management of the driver software are explained in the Application Manual of your miroTIGER.

The miroTIGER disks are not copy protected. After you are finished with the hardware installation of your miroTIGER system you should make safety copies of the miroTIGER disk(s) with the DOS command **DISKCOPY** – if you haven't done so already.

Keep the original disks in a safe place and only work with the copies.



2. The Installation Program

After installing the miroTIGER hardware you need to do the same with the miroTIGER software. Use the supplied installation program. It's called **INSTALL.EXE**; you find it on disk 1.

The installation program

- installs the TIGA interface on your hard disk
- adjusts the miroTIGER board and monitor to each other
- installs the driver software for the applications on your hard disk

How to use it

The installation program is multi-lingual: you can do the installation in the language you are most comfortable with. With successive program calls the program automatically announces itself in the language you chose.

The installation itself is interactive; a dialogue leads you through the program while you are answering questions over the keyboard. To make the interaction as easy as possible, the program has a context-related help function which gives you all the necessary information on the screen.

You may do the installation program either via the keyboard or mouse.

How to use the keyboard

You select the menu item you want with the direction keys; the selected menu item appears color-inverted. Press the <Enter> key and your selection will be activated.

How to use the mouse

You select the menu item by moving the cursor onto it and clicking the mouse button once. The current menu item appears color-inverted. Click the selected item a second time, and it will be activated.

The masks

All the screen masks of the installation program, such as the one you see below, follow the same pattern:



- There is a **Title bar** containing the status information, telling you at which point in the program you are.
- In the center of the screen you have the **Menu window** (on the left), telling you the currently available options. The **Help window** (on the right) has detailed, context-related information about the item you selected.
- In the **Bottom line** you will find a list of keys to control the program.

Calling the program To start the miroTIGER installation program, this is what you need to do:

- Start the installation program from the disk by entering **install< >**

miroTIGER Installation - Main Menu	
Current information Install driver : TIGA Check board Adjust monitor Install driver : Windows 3.0 Install driver : Windows 3.1 Install driver : AutoCAD 11/12 Install driver : AutoCAD 9/10 Install driver : AutoShade Install driver : AutoSketch Install driver : 3D Studio End Back	- Install driver: TIGA - After you have installed your miroTIGER hardware, the TIGA (Texas Instruments Graphics Architecture) driver software must be installed and configured. Press Enter or click the mouse to get to the installation menu.
<+↑↓+> = SELECTION <↵> = CONFIRM <ESC> = BACK	

Main menu of the installation program (English)

The main menu

After you started the program (and selected the language you want to do the installation in), switch to the main menu of the installation program. Here you will find the following commands:



- **Current information**

After selecting this command the screen will display changes that may have taken place since this manual was printed.

- **Install driver: TIGA**

Select this menu item to install (among others) the TIGA interface and the miroMODE program on your hard disk. For more details refer to section 3 of this chapter.

- **Check board**

With this menu item the hardware components are checked.

- **Adjust monitor**

After installing TIGA you can use this function to check and if necessary correct the display's size and position with the help of a test picture. The parameters may be saved in a file.

- **Install drivers: applications**

With this menu item you install the drivers for your application programs on your hard disk. Since the scope of the supplied driver software is constantly increased, there might be discrepancies between the preceding illustration and what you see on your screen. For details about the installation and management of the supplied drivers, please check the Application Manual.

You should do the installation in the sequence prescribed in the main menu. That is: first install TIGA, then do the monitor adjustment if necessary, and finally install the application drivers you want.

3. TIGA

The first step within the software installation is the installation and configuration of the TIGA interface.



Installing TIGA

To have TIGA installed on your computer's hard disk, this is what you need to do:

- Start the installation program as explained above.
- In the main menu choose Install driver: TIGA

Now the installation program needs to know the drive and path for the subdirectory that needs to be created for TIGA (default: C:\TIGER)

- Press <Enter> if you want to accept the default, or overwrite the default and then press <Enter>.
- Select the option Install and press <Enter>.

As a result of the installation the TIGA files will be copied to your hard disk in the directory you specified. Certain parameters of your DOS operating system (path, environmental variable) are modified to assure flawless functioning of your miroTIGER system. So that you can start TIGA, a batch file called TIGER.BAT will be created. You find TIGER.BAT in the main directory of your hard disk. The file AUTOEXEC.BAT will be modified accordingly. In addition, the program call for COLORMOD.COM is added. In the singel screen configuration this program switches the VGA board to the color mode. An unchanged version of the AUTOEXEC.BAT is saved under the name AUTOEXEC.MIR.

- After the installation the menu Configure TIGA appears automatically.

Here you need to enter the following information:

- the monitor you connected to your miroTIGER board. In the list, mark the monitor you are using and confirm your selection. If your monitor is not on the list, choose the monitor class with a matching horizontal frequency. If the the exact horizontal frequency is not mentioned choose the monitor class with the next lower value.



- **the I/O address set with the DIP switches 1-1 to 1-7 (also see the section “DIP switch” in Chapter 2!)**
- **the memory mapped address range (16 KByte) to be occupied by the miroTIGER. If other components of your computer system use the same memory mapped address area a corresponding note will appear. For more details check Appendix A.**

After you have chosen the memory address range the install program automatically selects the option Configure. The following entries have been made by the install program:

- the default **software interrupt vector** to be used by TIGA (60h)
- the **type of board** you are using
- Press the <Enter> key, if you want to accept the default settings. If you want to define a different interrupt vector use the UP ARROW key, mark the corresponding option, overwrite the default value and then select the menu item **Configure**.
- Follow the instructions on the screen and answer the questions.
- Select the menu item **Configure**.

If necessary the file **CONFIG.SYS** will be modified now and the unchanged version is saved under the name **CONFIG.MIR**.

Loading TIGA

The file AUTOEXEC.BAT was modified by the installation program in such a way that after the installation TIGA is loaded automatically when you boot your computer.

You may also start TIGA by entering from DOS:

tiger boot< >



Details about the commands

In most cases TIGA is loaded by either one of these batch files: **TIGER.BAT** or **AUTOEXEC.BAT**. It's also possible to load TIGA with the following commands you enter from DOS.

To load the TIGA communication driver, enter:

tigacd< >

After it has been loaded, the graphics manager can be initialized. This is what you need to enter:

tigalnk -lx< >

TIGA test programs

As soon as TIGA has been loaded, the test programs **TESTPIC.EXE** and **TIGADEMO.EXE** will show you what your miroTIGER system can do. If necessary, use the **TESTPIC.EXE** program to adjust your monitor. Both programs are in the directory you specified for TIGA (default C:\TIGER).

Deactivating TIGA

To deactivate TIGA, it has to be removed from your computer's memory; enter:

tigacd -u< >.

The TIGA environmental variable

The TIGA environment variable contains information about the TIGA system files, the dynamic load modules, and the interrupt vector being used. If after loading TIGA you want to see the current environment variable, enter from DOS: **set**< >

If you accepted the defaults during the TIGA installation, your screen will show the following line:

TIGA=-mc:\tiger -lc:\tiger -i0x60

- The parameter **-mc:\tiger** indicates that the TIGA system files are in the subdirectory **C:\TIGER**.
- The parameter **-lc:\tiger** indicates that the load modules defined by the user are in the subdirectory **C:\TIGER**.



- Usually the TIGA communication driver uses the interrupt vector **60** (hex).

If you want to set the TIGA environmental variable manually, also use the DOS command **SET** as shown below:

```
set tiga=-mc:\sys -lc:\sys -i0x6F< >
```

In this example, the DOS environment for the TIGA system files and the dynamic load modules is set to the subdirectory C:\SYS. The TIGA communication driver is to use the interrupt vector 6F (hex).

Please note: The subdirectory on your hard disk that contains TIGA (default C:\TIGER), also includes a program called **SETUP.EXE**. This is an original Texas Instruments program that you can use to configure TIGA. Normally SETUP.EXE will not be used since the miroTIGER boards are configured via the installation program.

4. Adjust Monitor

With the option **Adjust monitor** you can check and/or correct the size and position of the picture created by the miroTIGER board. The changed parameters are inserted in the TIGA configuration file. If not already done so, the TIGA communication driver (TIGACD) is loaded when calling the option Adjust Monitor.

Within the corresponding menu you will see the monitor you chose during the TIGA installation and the possible resolutions with the number of representable colors.

For each resolution you can call up a test picture and correct position 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 take over the setting; press the <Esc> key to reject the setting.
- Use the <Enter> key to get the test picture for the next resolution. Press the <Esc> key to abort the monitor adjusting.

The changed settings are added to the TIGA configuration file TIGA.CL. 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 assign a name of your choice (maximally 64 characters).
- Activate the option **Install** so that your monitor timing will be inserted in the TIGA configuration file. The monitor selection list accepts the name.

miroTIGER Installation - Adjust Monitor	
Monitor resolutions: 1280 x 1024 (16 / 256 / 65k) 1024 x 768 (16 / 256 / 65k) 1024 x 768 (16.7 M) 800 x 600 (16 / 256 / 65k) 800 x 600 (16.7 M) Horz. frequency: 63 kHz Vert. frequency: 79 Hz Monitorname: miroC2071 Multifrequenz Install Back	- Test picture - Choose the resolution for which you want to check the image size and position. Use the following keys for possible corrections: image position: Cursor keys image size : <Ctrl> + Cursor keys Save : Enter key Abort : <Esc> key The creation of the testpicture requires some moments!
<↑↓→> = SELECTION <↵> = CONFIRM <ESC> = BACK	

Installation Program: Monitor Adjustment



- The option **Back** cancels all changes and returns to the main menu.

You can define up to 5 monitor configurations of your own.

The reinstallation of TIGA requires a new monitor adjusting, since in this case the individual monitor timings are deleted.



5. miroMODE

During the TIGA installation a program called **miroMODE.EXE** will be copied to the directory you specified for the TIGA files. With the program you can set the video mode of your miroTIGER board. Use miroMODE either with parameters in the command line or menu-controlled.

miroMODE menus To use miroMODE menu-controlled, enter from DOS:

miromode< >

Just like the installation program, miroMODE is also multi-lingual. miroMODE will announce itself in the language you selected for the installation program.

The following illustration shows the available modes, using the miroTIGER 8 board as example.

For miroTIGER 4, the available modes may be different than what is shown in the illustration. Each video mode is determined by the combination of several parameters:

miroTIGER miroMode 1.2

Mode	Resolution	Colors	Pagecount	Notes
0	1280 x 1024	256	2	▲
1	1280 x 1024	256	1	
2	1280 x 1024	16	2	
3	1280 x 1024	65536	1	
4	1024 x 768	256	2	
5	1024 x 768	16	2	
6	1024 x 768	65536	2	
7	1024 x 768	65536	1	
8	1024 x 768	16.7 M	1	
9	800 x 600	256	2	▼

Save / Exit

Abort

<+↑↓+> = SELECTION <↵> = CONFIRM <ESC> = BACK <F1> = HELP

miroMODE menu for a miroTIGER 8 board



- **Resolution:** these are available: 640 x 480, 768 x 576, 800 x 600, 1024 x 768 and 1280 x 1024.
- **Colors:** Depending on the operating mode, you may run the board with 16.7 mill., 65,536, 256 or 16 colors.
- **Page count:** In addition to the page shown on the monitor, a second page may be kept in the off-screen memory, so that double buffering **can be implemented. The screen is regenerated in a flash, you won't be able to notice any delay.**

Program control

Like the installation program, you can control miroMODE either over the keyboard or via the mouse. After you have started the program, use the following function keys or menu options to select an operating mode:

Key/Menu-option	Action
Direction keys	select operating mode
<F1>	Help
<Enter> key	select operating mode
Save/End	activate operating mode, quit program
Abort	abort miroMODE

Command line parameters

As an alternative to the method described above you may start miroMODE with suffix parameters. Enter this to get an overview of the possible parameters:

miromode help< >

The following table shows the possible parameters and their meanings:



Parameter	Select
640/768/800/1024/ 1280	horizontal resolution (= pixels per line)
480/576/600/768/1024	vertical resolution (= pixels per column)
16/256/65K or RC/ 16.7M or TC	colors
1/2	pages

If you accidentally enter invalid parameters or parameter combinations, a message will appear on the screen.

What miroMODE can do for you

While on one hand the miroMODE program gives you more flexibility, it might be necessary at times to set the miroTIGER boards with miroMODE to a certain mode because an application program specifically demands it.

The miroMODE program must be started when an application only supports a certain number of colors.



Example

If your miroTIGER system is to run with a resolution of 1280 x 1024 in 256 colors with a second page in the off-screen memory, enter this:

miromode 1280 1024 256 2< >

Please check the manuals of your application programs to see whether they support certain operating modes or require them.

Please note: The subdirectory on your hard disk that contains the miroMODE program (default C:\TIGER) also includes the program **TIGAMODE.EXE**. This is an original Texas Instruments program that should only be used instead of miroMODE if an application program specifically demands it.





Chapter 4: Specifications

1. miroTIGER 4

Bus Compatibility

- 16-bit IBM AT compatible host interface bus
- 1 slot used
- 16-bit optimized I/O bus interface

Graphics System Processor

- 32-bit TMS34020
- 40 MHz clock rate
- 512-byte cache (10 MIPS)

Memory on Board

- 4 MByte VRAM
used as video memory as well as program and data memory

Video Modes

Pixels	Colors	Vertical frequency
1280 x 1024	16, 256, 65,536	60 - 75 Hz
1024 x 768	16, 256, 65,536, 16.7 million	60 - 100 Hz
800 x 600	16, 256, 65,536, 16.7 million	60 - 100 Hz
640 x 480	16, 256, 65,536, 16.7 million	60 - 100 Hz
768 x 576*	16, 256, 65,536, 16.7 million	interlaced

* TV-Timing (PAL, NTSC)



Onboard VGA

- 640 x 480 pixels at 16 colors
- 800 x 600 pixels at 16 colors
- 256 KByte video memory
- VGA can be turned off

Video Connectors

- HR:15-pin D-type connector
- VGA:15-pin D-type connector

Address Assignment

- 8 Byte I/O Address range:
adjustable with DIP switch
Default: 360h - 367h
- 16 KByte Mapped Memory:
selectable by software

Power Requirements

- + 5 V, max. 2.5A
- +12 V, max. 0.25A

Options

- 4 MByte Memory Upgrade Kit
- Video Cable HR5
- VIDEO CONVERTER
- miroHIGHRISC



2. miroTIGER 8

Bus Compatibility

- 16-bit IBM AT compatible host interface bus
- 1 slot used
- 16-bit optimized I/O bus interface

Graphics System Processor

- 32-bit TMS34020
- 40 MHz clock rate
- 512-byte cache (10 MIPS)

Memory on Board

- 4 MByte VRAM
used as video memory
- 4 MByte DRAM
used as programm and data memory

Video Modes

Pixels	Colors	Vertical frequency
1280 x 1024	16, 256, 65,536	60 - 75 Hz
1024 x 768	16, 256, 65,536, 16.7 million	60 - 100 Hz
800 x 600	16, 256, 65,536, 16.7 million	60 - 100 Hz
640 x 480	16, 256, 65,536, 16.7 million	60 - 100 Hz

* TV-Timing (PAL, NTSC)

768 x 576*	16, 256, 65,536, 16.7 million	interlaced
------------	-------------------------------	------------





Onboard VGA

- 640 x 480 pixels at 16 colors
- 800 x 600 pixels at 16 colors
- 256 KByte video memory
- VGA can be turned off

Video Connectors

- HR:15-pin D-type connector
- VGA:15-pin D-type connector

Address Assignment

- 8 Byte I/O Address range:
adjustable with DIP switch
Default: 360h - 367h
- 16 KByte Mapped Memory:
selectable by software

Power Requirements

- + 5 V, max. 2.5A
- +12 V, max. 0.25A

Options

- 4 MByte Memory Upgrade Kit
- Video Cable HR5
- VIDEO CONVERTER
- miroHIGHRISC

* TV-Timing (PAL, NTSC)



3. miroTIGER 12

Bus Compatibility

- 16-bit IBM AT compatible host interface bus
- 1 slot used
- 16-bit optimized I/O bus interface

Graphics System Processor

- 32-bit TMS34020
- 40 MHz clock rate
- 512-byte cache (10 MIPS)

Memory on Board

- 4 MByte VRAM
used as video memory
- 4 MByte DRAM
used as programm and data memory

Video Modes

Pixels	Colors	Vertical frequency
1280 x 1024	16, 256, 65,536	60 - 75 Hz
1024 x 768	16, 256, 65,536, 16.7 million	60 - 100 Hz
800 x 600	16, 256, 65,536, 16.7 million	60 - 100 Hz
640 x 480	16, 256, 65,536, 16.7 million	60 - 100 Hz
768 x 576*	16, 256, 65,536, 16.7 million	interlaced



Onboard VGA

- 640 x 480 pixels at 16 colors
- 800 x 600 pixels at 16 colors
- 256 KByte video memory
- VGA can be turned off

Video Connectors

- HR:15-pin D-type connector
- VGA:15-pin D-type connector

Address Assignment

- 8 Byte I/O Address range:
adjustable with DIP switch
Default: 360h - 367h
- 16 KByte Mapped Memory:
selectable by software

Power Requirements

- + 5 V, max. 2.5A
- +12 V, max. 0.25A

Options

- 8 MByte Memory Upgrade Kit
- Video Cable HR5
- VIDEO CONVERTER
- miroHIGHRISC



Appendices

Appendix A: Address Assignment

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

– I/O address range

miroTIGER occupies an I/O address range the size of 8 Byte, the base address may be set via the DIP switches 1-1 to 1-7. Default is 360h. For the list of the alternative addresses and their corresponding switch settings, check Chapter 2, Section “DIP Switch”.

– 16 KByte Mapped Memory

The miroTIGER boards occupy a 16 KByte large block in the Upper Memory range (the area between 640 KByte and 1 MByte) of the main memory. The appropriated memory area is set via the installation program.

The following table shows the ten address areas that can be used by miroTIGER:

C800h - CBFFh	DC00h - DFFFh
CC00h - CFFFh	E000h - E3FFh
D000h - D3FFh	E400h - E7FFh
D400h - D7FFh	E800h - EBFFh
D800h - DBFFh	EC00h - EFFFh

Using hardware components such as network controllers and software like an expanded memory manager (EMM) and upper memory block manager (UMB) can result in address conflicts. To avoid this change the memory area utilized by your miroTIGER board with the help of the installation program. Or you can exclude the memory reserved for the miroTIGER board so other software or hardware components won't be able to access it. In this case the



memory area required by miroTIGER has to be taken away from a memory manager by adding the appropriate entry to the **CONFIG.SYS** file.

The following table shows the entries using conventional expanded memory manager as example with the memory area C800-CBFF being excluded. For further details refer to the User's Manual of your EMM.

EMM	Entry in CONFIG.SYS
QEMM386	DEVICE=...\QEMM386.SYS...X=C800-CBFF
386MAX	DEVICE=...\386MAX.SYS...RAM=C800-CC00
MS-Windows	DEVICE=...\EMM386.SYS...X=C800-CC00
MS-DOS 5.0	DEVICE=...\EMM386.EXE...X=C800-CC00
DR-DOS	DEVICE=...\EMM386.SYS.../E=C800-CBFF

Make any required changes to your system and reboot before proceeding with the software installation.

The memory area that was blocked for the EMM has to be identical with the one entered during TIGA installation.

– VGA-specific addresses

If the miroTIGER VGA is activated, VGA addresses will be occupied in addition to the ones listed above. These are:

I/O addresses	3C0h - 3CFh
	3BAh/3DAh
	46E8h/46E9h
	3B4h/3D4h
	3B5h/3D5h
VGA display memory	A000h - BFFFh
VGA-BIOS	C000h - C7FFh

Appendix B: In Case of Problems

After the hardware installation

If you are experiencing trouble when booting, turn your computer and monitor off for the moment! The following questions show a number of error sources. Correct the problem with the help of the suggested remedies:

- *Is the cable from the miroTIGER board to the monitor connected correctly?*
- *Is the miroTIGER board seated properly in the slot?*
- *Is more than one VGA board active on your system?*
Deactivate a second VGA board (see page 2-6).
- *Is the I/O address used by your miroTIGER also utilized by another hardware component?*
If this is the case, change either the base address of the I/O port of the miroTIGER board (s. Section “DIP switch”) or the base address of the affected hardware component.

During or after the software installation

This section lists error sources for problems that you may have during or after the installation. It may occur that a miroTIGER 8 board will not be recognized by the installation program or your TIGA application do not run properly. In this case check the following:

- *Does your computer dispose of secondary cache (also known as second level cache)?*
If this is the case the memory mapped area occupied by miroTIGER (C000h - DFFFh) has to be excluded from caching. The system area E000 - EFFF can be cached. When choosing the memory area for miroTIGER make sure that it is located in the C or D segment as well. For further information refer to the computer’s documentation.



If your TIGA applications run correctly but you have problems with getting a picture on your screen, check the following:

- *Does another card use the I/O address set via the DIP switch (switches 1-1 to 1-7)?*

In this case, change the I/O address of the miroTIGER board and repeat the installation.

- *Is the memory address area reserved for the miroTIGER board used for example by expanded memory managers or cache memory systems?*

If the miroTIGER system did not recognize an EMM for example, you need to reconfigure your graphics system with the installation program. Or you can prevent your software from accessing the reserved memory area by adding the proper line to the CONFIG.SYS file. For more information, check the manual of the corresponding hardware or software component.

- *Is the software interrupt used by TIGA (60h) also being utilized by another TSR (Terminate and Stay Resident) program?*

Select another interrupt for TIGA. You can either repeat the TIGA configuration via the installation program or modify the TIGA environmental variable. As an alternative you can change the software interrupt of the component causing the problem.



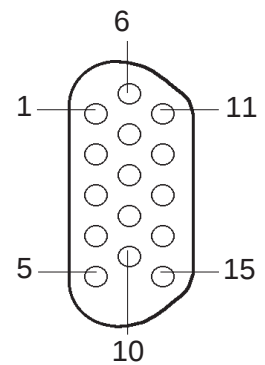
Appendix C: 15-Pin Video Connectors

The miroTIGER boards are equipped with two 15-pole sub-miniature ports. These two ports **must** not be used interchangeably:

- Connect the video cable for the high resolution monitor to the port labelled **HR**.
- In the dual screen solution, connect the video cable of the VGA monitor to the port labelled **VGA**.

The following table and graphics show the connector and corresponding pin assignment:

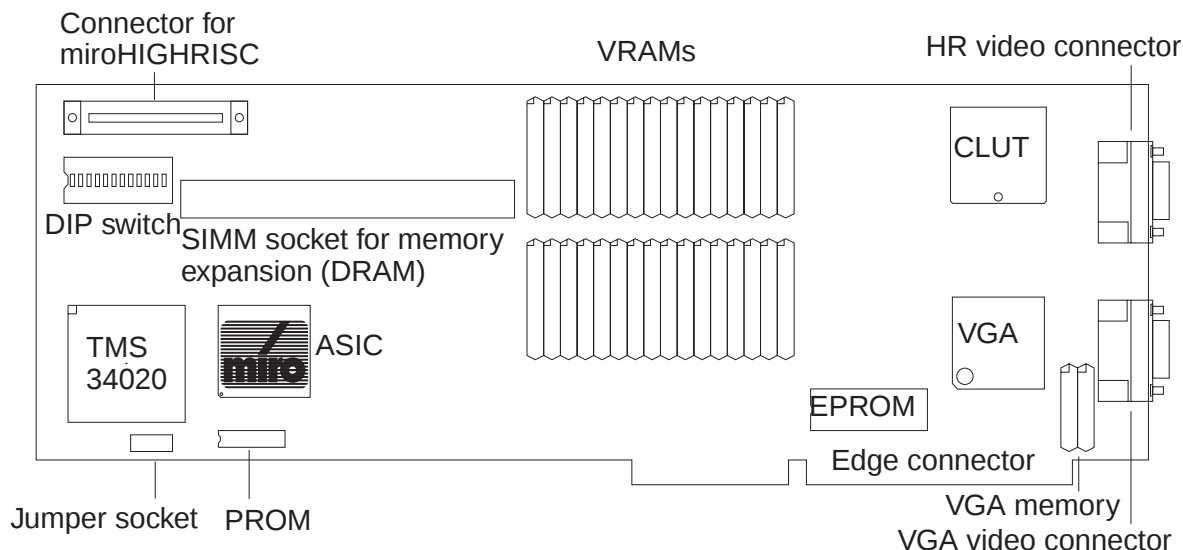
Pin No.	Assignment
1	red
2	green
3	blue
4	monitor ID bit 2
5	grounded (analogue)
6	grounded (red)
7	grounded (green)
8	grounded (blue)
9	free
10	grounded (sync)
11	monitor ID bit 0
12	monitor ID bit 1
13	Hsync
14	Vsync
15	free



15-pin video connector

Appendix D: The miroTIGER Board Layout

The following illustration and explanations give details about the miroTIGER board's most important components.



ASIC

stands for Application Specific Integrated Circuit, which contains a complex application specific circuitry logic.

CLUT

stands for *Color LookUp Table*, where each color is saved as an indexed value.

Connector for miroHIGHRISC

To this connector you can connect the accelerator board miroHIGHRISC through a ribbon cable.

DRAM/VRAM

is the Random Access Memory on your board. Two kinds of RAM are used: *Dynamic RAM* (=DRAM) and *Video RAM* (=VRAM). Both types of the miroTIGER board have 4 MByte VRAM. miroTIGER 8 has 4 MByte DRAM in addition.

Edge connector

You need it to be able to communicate with your IBM compatible computer via the PC bus.

EPROM

The *Erasable Programmable Read-Only Memory* contains the basic routines for your graphics board.



HR video connector	It connects the video cable with the high resolution monitor via a 15-pin connector. Refer to Appendix C for details about the pin assignment.
PROM	<i>A Programmable Read-Only Memory</i> for address coding.
SIMM socket for memory expansion (DRAM)	With the miroTIGER 4 board you can insert a SIMM into this socket. The SIMM consists of a board with plug-on DRAM chips. The miroTIGER 8 board comes with the SIMM.
Switches	The board's defaults – the I/O address, the amount of DRAM, and activating of the miroTIGER VGA – are determined by the setting of the DIP switches. For details check Chapter 2.
TMS34020	The processor of your miroGRAPH board.
VGA	The VGA chip integrated on your miroTIGER board.
VGA video connector	In the dual screen solution it connects the video cable with the VGA monitor via a 15-pin connector. For an overview of the pin assignment check Appendix C.



Appendix E: Installing the Upgrade Kit

You can upgrade the miroTIGER 4 board installing the 4 MByte or 8 MByte memory upgrade kits consisting of a SIMM (Single In-line Memory Module) and a matching PROM component.

The SIM-module consists of a board with plug-on DRAM chips (capacity 4 MByte or 8 MByte) with contacts on the bottom side, which are installed in the SIMM socket of your miroTIGER board.

The upgrade-kit includes two PROMs.

If you have a **miroTIGER board version Rev. A** (see writing on the board) without a connector for miroHIGHHRISC, use the **PROM labeled Rev. A**. The **PROM labeled Rev. B** has to be used for the **board version Rev. B** (with connector for miroHIGHHRISC).

The memory expansion can only be used as a set (SIMM and PROM)!

Only an authorized dealer may install the memory expansion and exchange the PROM.

+

Installing the SIMM

Appendix D shows the location of the SIMM socket and PROM on the graphics board. This is what you need to do to install the SIMM:

+

- Turn off your computer and all peripheral devices. Disconnect all power and connecting cables.
- Remove the computer's lid.
- Touch the power supply case to divert any possible electrostatic charge.
- Carefully remove the miroTIGER board from the computer.



- Put the graphics board on a level surface with the component side on top, so that the edge with the SIMM socket is facing you (Rev B.)/not facing you (Rev. A).
- Insert the SIMM – the side with the components is facing you – into the SIMM socket at an angle and press it down lightly.



Attention! Make sure that you do not bend any of the SIMM socket's or PROM's contacts when you install the memory expansion.

- Tip the SIMM to the back so that the SIMM clicks into position and the plastic clips hold it securely at the sides of the socket.

Exchanging the PROM

To give the system access to the new memory expansion, the PROM already present on the graphics board has to be exchanged by the one that came with the upgrade kit.

The PROM is located beneath the ASIC component with the miro-Logo on it.

- Place the graphics board on a level surface, so that the bottom with the PROM is facing you.
- Use a suitable tool (such a medium-sized screwdriver), hook it under the PROM, and carefully lift it out.
- Hold the new PROM above the free slot; the PROM's notch should be on the left side and the individual contacts above the corresponding holes of the socket.
- Carefully insert the PROM.

After you have installed the memory expansion and exchanged the PROM, you need to do the following: change the setting of DIP switch 1-8 and reconfigure TIGA.

Setting the DIP switch

Since the miroTIGER board now has program memory (DRAM), the switch **1-8** of the DIP switch has to be set to **off**.



Reconfigure TIGA

- Call the installation program.
- Select **Install driver: TIGA** from the main menu.
- In the following menu choose **Configure**.
- Move the RIGHT ARROW key to the option **Board type**. Press the <Enter> key a second time. Since the graphics board now equals the miroTIGER 8 or the miro-TIGER 12, an 8 or an a 12 should appear in the input field.
- Select the menu item **Configure**.
TIGA is now being reconfigured for the board type.



Appendix F: Setting the TV mode

To be able to use the VIDEO CONVERTER by miro and to display a computer image on your TV screen or record it by a VCR, miroTIGER has to operate in the TV mode.

You can set your miroTIGER board to the TV mode using the installation program (version 1.2 or later. If you have already installed the monitor files for the TV mode, you can start the installation program directly from your hard disk. Proceed as follows:

- Start the installation program from the hard disk or from the installation disk by entering:
install < >
- From the main menu select the item
Install driver: TIGA.
- Under **Source** enter the drive and the path of the directory where the files with the monitor parameters are located.
- Select the option **Configure.**
- From the monitor list select the option
miro VIDEO CONVERTER.
- Select the option **Configure** and quit the installation program.
- Select the desired resolution and the number of colors using the **miroMODE** program.
- **Only for Windows:**
Select a driver for resolutions of up to 1024 x 768 pixels.
- Start your application which will now be displayed on the TV screen or the VCR.



To return to your high-resolution computer monitor, perform the steps described above accordingly. That is, start the installation program, select your high-resolution monitor, select the desired resolution and number of colors using miroMODE and, if you use Windows, select the correct driver.



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