

VGA W O N D E R[™] X L S E R I E S



User's Guide

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Made in Canada 91 01 04

ATI TECHNOLOGIES INC.
3761 Victoria Park Avenue
Scarborough, Ontario
Canada M1W 3S2
Tel: (416) 756-0718
Fax: (416) 756-0720

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VGAWONDER XL

User's Guide

Version 2.0 - December, 1991

P/N: 10701B0720

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ATI Technologies Inc. Support: (416) 756-0711
3761 Victoria Park Avenue Office: (416) 756-0718
Scarborough, Ontario Fax: (416) 756-0720
Canada M1W 3S2 BBS: (416) 756-4591

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FCC Compliance Statement

Warning

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Note

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning

The use of shielded cables for connection of the monitor to the card is required to assure compliance with FCC regulations.

DOC Compliance Statement

This digital apparatus does not exceed the class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Avis De Conformation MDC

Cet appareil numérique respecte les limites de rayonnement de bruits radioélectriques applicables aux appareils numériques de classe B, prévues au Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

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VGAWONDER XL

1

Introduction

Congratulations on your purchase of the **VGAWONDER XL**, the most versatile and best value VGA card on the market today. Available in 256K, 512K and 1.0MB memory configurations, the **VGAWONDER XL** has been designed with many advanced features, superior performance and resolution.

The **VGAWONDER XL** displays high resolution 1024x768 and 800x600 graphics in interlaced and non-interlaced modes. In addition, it supports ergonomic refresh rates in 60Hz, 70Hz and 72Hz for reduced eyestrain. Plus, full 256 color support in all high resolutions, including 640x480, 800x600 and 1024x768. In addition the **VGAWONDER XL** can display 32,768 colors in 640x480 and 800x600 resolution.

Perfect for today's powerful 80286/386/486 computers, the **VGAWONDER XL** features a high speed architecture and a 16-bit datapath to accelerate CAD, Desktop Publishing and graphics intensive applications. With its advanced design, the **VGAWONDER XL** provides superior performance, without the expense of VRAM memory. 100% register-level compatibility with VGA, EGA, CGA, Hercules and MDA ensures that all software written for these modes will run with the **VGAWONDER XL**.

Along with its many sophisticated features, the **VGAWONDER XL**'s switchless design eliminates the need to set all jumpers and switches, making installation quick and easy, simply a Plug-and-Go operation. Menu driven software utilities are included to further enhance the operation of the **VGAWONDER XL**.

Your **VGAWONDER XL** maintains a high level of reliability and performance for years of video enjoyment and productivity.

Features

Color Depth Enhancement (CODE)

- Unique to ATI's Windows drivers, CODE allows the viewing of 24-bit images (including TGA, TIFF, PCX, BMP) in 15-bit color with near photo-realistic accuracy. By displaying up to 262,144 simultaneous colors, CODE effectively eliminates color banding in 640x480 and 800x600 resolutions.

Displays High Resolution 1024x768 and Super VGA 800x600 on Multisync and 8514/8515 Monitors¹

- VGAWONDER XL displays up to 1024x768 and 800x600 in 256 colors as well as 32,768 colors in 640x480 and 800x600. Both interlaced and non-interlaced 1024x768 and 800x600 resolutions are supported.

High Performance Design.

- Page mode memory, extensive FIFOs, dynamic CRT/CPU memory interleaving and 16-bit bus support.

Ergonomic 72Hz High Refresh in ALL High Resolutions

- Provides 72Hz/70Hz/60Hz refresh rate in 1024x768, 800x600 and 640x480 for less flicker and reduced eyestrain.

Displays VGA, EGA, CGA, MDA, and Hercules on Analog/VGA, Multisync and Compatible Monitors

- Displays modes not normally available on these monitors.
- Additional modes of 640x480 in 256 colors from a palette of 256K colors and 640x480² in 32,768 colors.
- All 17 VGA modes up to 640x480 in 16 colors from a palette of 256K colors.
- 132 columns by 44 or 25 row text.

¹ 1024x768 not available on NEC Multisync 2A and other dual-mode monitors.

² 1.0MB version only.

100% Register-Level Compatibility

- Provides both register-level and BIOS compatibility in VGA, EGA, CGA, MDA and Hercules modes for full compatibility with software written for any of these modes.

Plug-&-Go Switchless Installation

- Automatic configuration makes installation easy. The VGAWONDER XL has software utilities that allow the user to easily create and change configurations.

Mouse and Interface

- The VGAWONDER XL has integrated mouse support. A Microsoft-compatible, three button, 400dpi inport mouse is included. (Any Microsoft software compatible mouse with a 9 pin, PS/2 style circular connector can be used).

Advanced CMOS VLSI Gate Array Technology

- Built around the proprietary ATI/VGA chip, the VGAWONDER XL features low power consumption, high speed performance and complete reliability.

Extensive Software Driver Support

- VGAWONDER XL comes with a variety of software drivers and is supported by over 100 software packages.

Available in 256K, 512K and 1.0MB Video Memory

- VGAWONDER XL 256K is user upgradeable to 512K and 1.0MB (refer to Appendix D). The 512K and 1.0MB versions will support more colors at a given resolution as shown below:

Resolution*	Colors with 256K memory	Colors with 512K memory	Colors with 1.0MB memory
1024x768	4	16	256
800x600	16	256	256/32,768/262,144
640x480	16	256	256/32,768/262,144

* Actual color support is dependent on the software driver used.

VESA¹ Compliant.

- Supports software drivers written to VESA Super VGA 800x600 and 1024x768 modes.
- Supports VESA recommended 640x480/72Hz, 800x600/72Hz and 1024x768/70Hz operation.

Warranty.

- Five Year Limited Warranty.

How To Use This Manual

1. Refer to the README file on disk #1 for the latest changes.
2. Refer to Chapter 3, for information on your specific monitor.
3. To install the graphics card, use Chapter 5 "Installing the VGAWONDER XL" (Chapter 4, for experienced users).
4. To install the utilities and software drivers, refer to Chapter 6, "Software Installation" to ensure correct configuration and optimum performance.

Command Syntax

When prompted to use the VGAWONDER XL utilities in this guide, the following convention is used:

Example:	C:>COMMAND [keyword] [option] <enter>
C:>	Refers to the DOS command prompt.
COMMAND	Is an executable file (i.e. VINSTALL).
[keyword]	Denotes an optional keyword.
[option]	Denotes an optional argument or condition.
<enter>	Specifies an actual key to be used.

README Files

On disk #1 is a README file containing the latest information on the utilities and drivers. The VINSTALL utility also contains additional information on each driver. This information is accessed by selecting the desired driver from the VINSTALL menu "Install Video Drivers" and pressing the <F1> key.

To examine the README[.XXX] file, at the DOS prompt type:

```
A:>TYPE [README.XXX] <enter>
```

or use a word processor to print this file.

¹ Video Electronic Standard Association

Contents Of The Package

2

Your VGAWONDER XL package includes the following:

- VGAWONDER XL Board.
- User's Guide, including Warranty Registration Card.
- Two high density software disks:
 - Disk 1 - VGAWONDER XL Utilities and Drivers.
 - Disk 2 - VGAWONDER XL Additional Drivers.
- Microsoft Inport compatible mouse.

If your package does not include the above items, contact your dealer immediately.

If installing the VGAWONDER XL into a system which requires 3.5" disks, please call ATI Technologies Customer Support and we will send the appropriate disks, or contact your dealer to have the software transferred to your disk format.

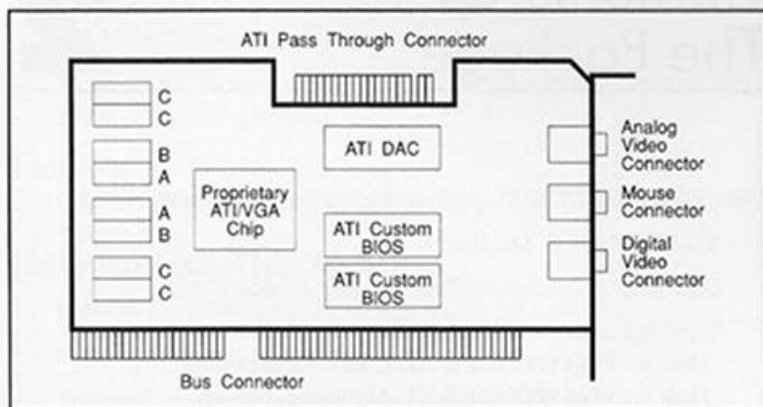
Be sure to make working copies of the original disks to prevent accidental erasure of important files.

To make a backup copy of the disks, use the following procedure:

1. Format two high density disks.
2. Insert disk into Drive A:
3. Type the DOS command:


```
C:>DISKCOPY A: B: <enter>
```
4. When prompted for your SOURCE disk, insert one of the original disks.
5. When prompted for your TARGET disk, be sure to use a formatted blank disk.
6. Repeat steps 3 - 5 for the other disk.

VGAWONDER XL Block Diagram



- A - Sockets used for standard 256K memory.
 B - Sockets used for upgrade to 512K memory.
 C - Sockets used for upgrade to 1.0MB memory.

Monitor Selection

3

Automatic Monitor Detection

VGAWONDER XL uses automatic monitor detection to configure the card for the type of monitor being used. Connect the monitor to the VGAWONDER XL and turn on the monitor before the computer system or an incorrect monitor will be detected.

Software - Monitor Compatibility Chart

SOFTWARE		MONITORS					
Modes/ Resolutions	Colors/ Palette ¹	Digital			Analog		
		TTL ²	RGB	EGA	VGA	IBM 8514	Multisync
1024x768 NI*	256/256K						✓ ³
1024x768 I*	256/256K					✓	✓ ⁴
800x600	32,768/32,768 256/256K					✓ ⁵	✓
640x480	32,768/32,768 256/256K				✓	✓	✓
VGA	16/256K				✓	✓	✓
EGA	16/64	✓	✓	✓	✓	✓	✓
CGA	B/W 4/16	✓	✓	✓	✓	✓	✓
Hercules	Mono Attributes	✓	✓	✓	✓	✓	✓
MDA	Mono Attributes	✓	✓	✓	✓	✓	✓
Lines in 132 Columns ⁶		25/44	25	25/44	25/44	25/44	25/44

* NI = Non-Interlaced, I = Interlaced.

¹ Color palette based on 1.0MB version.

² Displayed in shades on monochrome monitors.

³ Non-interlaced monitor such as Multisync Plus, XL, 4D, 5D.

⁴ 1024x768 not supported on the Multisync 2A and other dual mode monitors.

⁵ Interlaced.

⁶ Requires at least 512K memory.

Video Default Modes

The VGAWONDER XL comes pre-configured for various video modes and resolutions depending on the type of monitor detected, as shown in the following table:

Monitor Attached	Video Resolution	Video Mode	Monitor Detected
Multisync Analog ¹	VGA	CV80	PS/2 Color ²
Multisync Digital ³	EGA	CE80	EGA
8514	VGA	CV80	PS/2 8514
Color VGA/Analog	VGA	CV80	PS/2 Color
Mono VGA/Analog	VGA	MV80	PS/2 Mono
EGA	EGA	CE80	EGA
RGB	EGA	C80	RGB
TTL Monochrome	EGA	CE80	Monochrome
No Monitor Attached	VGA	MV80	PS/2 Mono

- 1 Some Multisync monitors are detected as an 8514 monitor.
- 2 When using a Multisync monitor, run VINSTALL to ensure the correct type of Multisync monitor is selected. This will provide you with the optimum performance from your Multisync monitor.
- 3 Using the digital mode is not recommended for a Multisync monitor.

The video modes listed above refer to the following display formats:

Video Mode	Video Resolution	Text Format
CV80	Color VGA	80 columns x 25 rows
CE80	Color Enhanced EGA	80 columns x 25 rows
MV80	Mono VGA	80 columns x 25 rows
C80	Color EGA	80 columns x 25 rows

Warning

Do not change monitors or connect a monitor (if one is not attached) when your computer is on. Serious damage can result to the monitor.

Use the utility VINSTALL (Refer to Chapter 6) to permanently change any of these selections.

TTL Monochrome (18.43KHz)

These monitors are designed to be used with Hercules or MDA cards. If connected to the VGAWONDER XL, the following software standards can be displayed:

- Monochrome text mode.
- Hercules text and graphics modes 720x348.
- CGA text and graphics mode - 320x200 in 4 or 16 shades.
- EGA text and graphics mode - 640x350 in 2 or 16 shades.
- 132 column x 44 (or 25) row text¹.

RGB Color (15.75KHz)

These monitors are designed to work with CGA cards. With the VGAWONDER XL, RGB monitors can display the above modes with the following differences:

- CGA and EGA are displayed in colors instead of shades.
- 132 column x 25 row text¹.

Note

To display the EGA or Hercules resolution on RGB monitors, an interlacing technique is used. This can result in some "flickering" of the image.

EGA (15.75 & 21.85 KHz) (Enhanced Graphics Adapter Monitors)

EGA monitors are designed to work with either CGA or EGA cards. Using the VGAWONDER XL, EGA monitors can display:

- Hercules text and graphics modes - 720x348.
- CGA graphics mode - 320x200 in 16/64 colors.
- EGA text and graphics modes - 640x350 in 16/64 colors.
- 132 column x 44 (or 25) row text¹.

VGA/Analog Monitors (31.5KHz) (or PS/2 display)

In addition to displaying the same modes as an EGA monitor (including Hercules and CGA), the VGA/Analog monitor will allow the following modes:

- All 17 of the IBM VGA modes, up to 640x480/16 colors.
- 640x480¹ in 256/256,000 colors and 640x480² in 32,768 colors.
- 132 column x 44 (or 25) row text¹.

¹ 512K or 1.0MB versions only.

² 1.0MB versions only.

IBM 8514/8515 (43.5KHz) (or compatible)

The IBM 8514/8515 monitors are high resolution Analog color monitors. The 8514/8515 will allow the use of the following modes:

- 640x480 in 32,768¹ colors.
- VGA, EGA, CGA, Hercules and MDA.
- 1024x768 in 256 colors interlaced.
- 800x600 in 256 and 32,768² colors interlaced.
- 132 column x 44 (or 25) row text¹.

Multisync or Multifrequency Monitors

Multisync monitors will operate at a range of frequencies and will provide the widest graphics support. Multisync monitors should be used in the Analog mode for optimum results with the **VGAWONDER XL**. Connect the 15 pin VGA/Analog cable from the monitor to the **VGAWONDER XL** and move the signal switch (if applicable) on your monitor to ANALOG.

- Hercules text & graphics modes 720x348.
- CGA graphics mode - 320x200 - 4/16 colors, 640x200 - 2 colors.
- EGA text & graphics modes - 640x350 - 16/64 colors, 640x200 - 2 colors.
- 132 columns x 44 (or 25) row text¹.
- All the IBM 17 VGA/Analog modes.

Note

Refer to the Operating Manual of the monitor for more details or call your dealer to obtain the necessary cables and adapters if required.

Also, Multisync monitors can display high resolution ATI modes. Software drivers are included by ATI Technologies or by the software manufacturer to support these resolutions:

- 640x480 in 256²/256K colors.
- 800x600 in 256³/256K colors.
- 1024x768³ in 256⁴/256K colors (interlaced or non-interlaced).

Your monitor must be able to support the horizontal and vertical frequencies to display these high resolution modes. Check the

¹ 1.0MB versions only.

² 512K or 1.0MB versions only; with 256K, 16 colors.

³ 1024x768 is not supported by all Multisync monitors (NEC Multisync 2A).

⁴ Requires 1.0MB memory, 16 colors with 512K, 4 colors with 256K.

VGAWONDER XL specifications section for signal compatibility with your monitor.

Note

When using a Multisync monitor, run VINSTALL to ensure the correct monitor has been selected. This will provide you with the optimum performance for your Multisync monitor. Refer to VINSTALL in Chapter 6 for details on monitor selection.

72HZ Refresh Rate

In addition to the high resolution modes supported, the **VGAWONDER XL** supports faster 72Hz vertical refresh rates. The use of 72Hz refresh rate is ergonomically pleasing for the human eye as screen updates occur at 72 times a second, therefore reducing eyestrain due to less perceived flicker. In addition, 70Hz and 60Hz operation is supported, as shown below:

640x480 Resolution			
Refresh Rates/Colors	Memory Required		
	256K	512K	1.0MB
60Hz			
16 Colors	✓ ¹	✓	✓
256 Colors	-	✓	✓
32,768 Colors	-	-	✓
72Hz			
16 Colors	-	✓	✓
256 Colors	-	✓	✓
32,768 Colors	-	-	✓

¹ IBM uses 60Hz refresh in VGA mode.

800x600 Resolution			
Refresh Rates/Colors	Memory Required		
	256K	512K	1.0MB
60Hz			
16 Colors	✓	✓	✓
256 Colors	✓	✓	✓
32,768 Colors ¹	-	-	✓
70Hz			
16 Colors	-	✓	✓
256 Colors	-	✓	✓
72Hz			
16 Colors	-	✓	✓
256 Colors	-	-	✓

¹ 800x600/32,768 is supported at 60Hz or lower refresh rates.

1024x768 Resolution			
Refresh Rates/Colors	Memory Required		
	256K	512K	1.0MB
60Hz			
16 Colors	✓	✓	✓
256 Colors	-	-	✓
70Hz			
16 Colors	-	✓	✓
256 Colors	-	-	✓
72Hz			
16 Colors	-	-	✓
256 Colors	-	-	✓

To use the faster refresh rates, your monitor must be capable of supporting the higher vertical scan frequencies. Consult the **VGAWONDER XL** specifications and your monitor manual for further information. If the monitor cannot support 72Hz it will fall back to the highest refresh rate that it can support.

The resolution selected for your software application program is independent of the refresh rate. The refresh rate depends on the Analog Monitor Setup in **VINSTALL** (see Chapter 6 and Appendix E), while the resolution depends on the software driver installed.

Quick Start (Experienced Users Only)

4

This chapter can be used as quick reference for the experienced user. Refer to Chapter 5 for complete instructions.

Note

Completion of your Warranty Card is important in order to validate your Warranty and to use Customer Support Services. Before installing the **VGAWONDER XL** into your system, note the serial number and record it on the Customer Support Form in Appendix A, as well as on your Warranty Card found at the back of this manual.

1. Unplug computer and remove the cover. Remove any video cards and install the **VGAWONDER XL** into any available slot. Seat and secure with a mounting screw.
2. Set switches.
For IBM PC, PC/XT and Compatible Users, set switches 5 and 6 on switch block 1 to the "ON/CLOSED" position.
For IBM AT and Compatible Users, if applicable, set the video selection switch or jumper to the "COLOR" position.
3. Re-install cover of computer and connect power cord. Connect analog monitor to video port on the **VGAWONDER XL**.
4. Turn on the computer.

Warning

Changing monitors after powering up your computer could damage your monitor.

5. Run **VINSTALL** from software disk one to install the utility drivers onto your hard disk. (Refer to Chapter 6 for further details). **VINSTALL** also optimizes the configuration of your **VGAWONDER XL** and enables the mouse.

Installing The VGAWONDER XL

5

Note

Completion of your Warranty Card is important in order to validate your Warranty and to use Customer Support Services. Before installing the VGAWONDER XL into your system, note the serial number and record it on the Customer Support Form in Appendix A, as well as on your Warranty Card found at the back of this manual.

The VGAWONDER XL is designed for use in any 8- or 16-bit PC/XT ISA (Industry Standard Architecture) expansion slot in an IBM PC/AT 8088/286/386/486 or compatible or the IBM Personal System/2 Model 30/35¹/40¹.

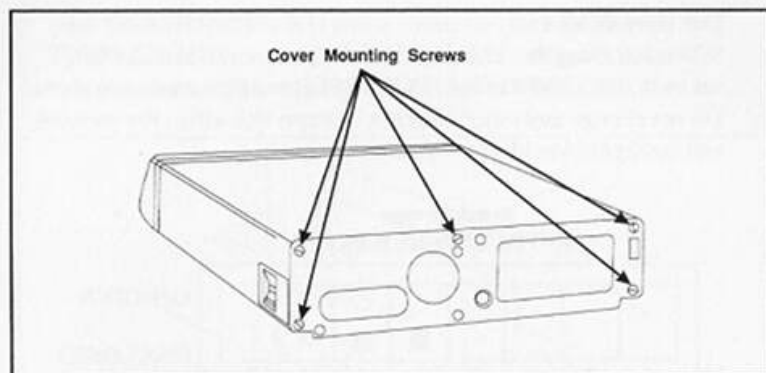
In order to install the VGAWONDER XL, it will be necessary to understand the interrupts and I/O addresses on your computer system. If you do not feel comfortable in making these changes, you should consult a qualified computer technician. Installing the VGAWONDER XL is an easy process that can be completed in 15 minutes. Read the following instructions before you start.

Note

Static electricity can seriously damage the components in your computer. Ensure that you have discharged any static electricity by grounding yourself to the chassis of the PC before you begin.

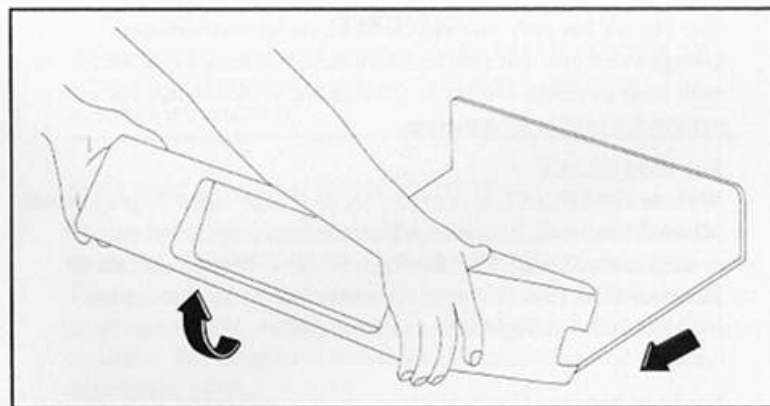
1. Ensure that the system is switched off and the power cord removed before starting. Damage to the system and the VGAWONDER XL may result if the power is left on. Remove the cover mounting screws from the rear of the PC. On the IBM/AT, unlock the keylock before removing the cover.

¹ On-board video must be disabled on models 35 and 40. Consult hardware vendor for instructions.



Some compatible PC's have a hinged top for convenience. If your system appears to be different, consult your System User's Manual for instructions on board installations.

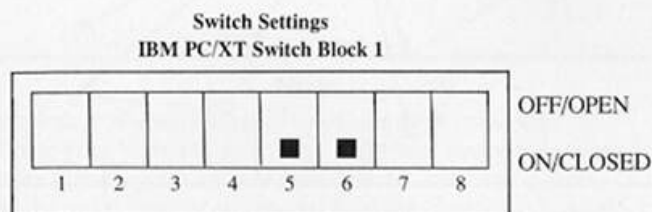
2. Carefully slide the cover forward, until it will go no further, then tilt the cover away from the system unit and remove it from the system.



3. **For IBM Personal System/2 Model 30/35/40**
Remove the cover mounting screws located on each side of the system. Slide the cover backwards and remove by lifting straight up. Put the screws in a safe place, you will need them later.

For IBM PC/XT

When installing the VGAWONDER XL in an IBM PC, PC/XT, set switches 5 and 6 to the ON/CLOSED position as shown above. Do not change any other switches as these will affect the memory and configuration of your system.

**Note**

Do not use a pencil to set the switches, as the graphite residue can damage your computer.

The PC/XT has only one switch block on its motherboard. Compatibles may have different switch locations, especially those with built in video interfaces. Consult the User Manual for your system for further information.

For IBM PC/AT

With an IBM PC/AT, it is necessary to set the video display switch (Color/Mono switch) on the AT motherboard to Color and configure the CMOS RAM using a Systems Setup Program or System ROM. (Consult your computer user guide for further information). Configure the system for EGA, VGA or no display option.

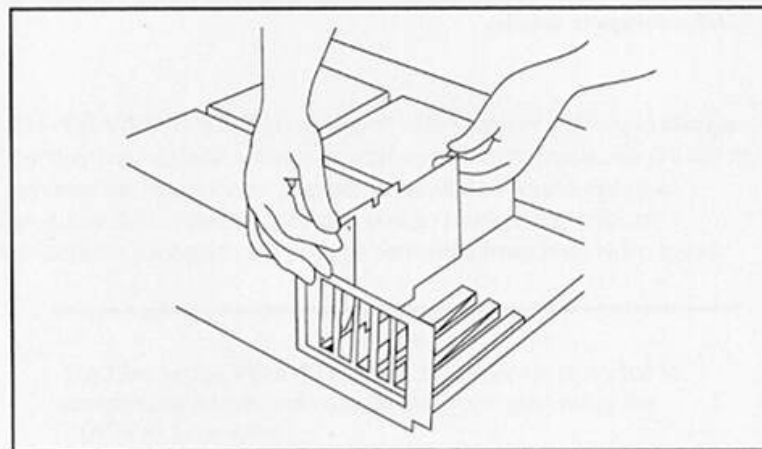
For Dual Monitor Configurations, refer to Appendix B.

For IBM PS/2 Models 35 and 40

It is necessary to disable the on-board VGA to allow your VGAWONDER XL to control the display. Consult your system manual or contact your dealer for instructions on disabling on-board VGA.

4. Remove the slot cover in an empty slot. Grasp the card by the top edge and firmly seat it into the expansion slot as shown below. Fasten the screw at the top of the VGAWONDER XL's retaining bracket and tighten it. If using an 80286/386/486 computer, install

the VGAWONDER XL into a 16-bit slot for maximum performance. 16-bit slots will accommodate both gold edge connectors on the bottom of the VGAWONDER XL.

**Warning**

Only one monitor can be attached to the VGAWONDER XL at any time. Damage to your monitors may result if two monitors are attached.

5. Replace the covers and fasten the screws.
6. Connect your monitor to a video connector. There are provisions on the VGAWONDER XL for both 9 pin and 15 pin connectors. The (lower) 9 pin connector is for use with TTL monitors, and the (upper) 15 pin connector is for use with Analog VGA or Multisync monitors. See Chapter 3, "Monitor Selection" for a detailed description of your monitor.

Note

Your monitor must be connected to the VGAWONDER XL, before switching on your system. The monitor type is detected at the power up stage only. Do not change monitors without turning off the power as serious damage can result to the monitor.

7. Connect your mouse to the middle port (round 9 pin connector).

8. The system is now ready to run. Run VINSTALL from software disk #1 to install the VGAWONDER XL Utilities and Drivers onto your hard disk. The install program will allow you to optimize its configuration and enable your mouse (refer to Chapter 6 for complete details).

Software Installation

6

The VGAWONDER XL is shipped with software utilities to change the hardware default settings as well as with high resolution drivers to enhance the operation of graphics programs on Multisync type monitors. It is recommended that you go through the software installation process to get peak performance from your video board.

Note

The files on the VGAWONDER XL disks are provided in compressed format and must be uncompressed using the VINSTALL program.

1. Insert disk #1 into drive A and at the prompt, type:
A:>VINSTALL <enter>

The VINSTALL program will perform various installation and testing functions. The first screen in the program is "Main Selection Menu" (shown below). It is the starting point for all menu-driven functions.



Getting Started

Keys listed below are used to move around in the menu system and to edit parameters. At all times, activated keys are shown at the bottom of the screen. Key functions are as follows:

- <F1> - is the HELP key. It is context sensitive. *Press it anytime for information on the highlighted topic or menu item.*
- <up> <down> - are movement keys. The highlight or cursor is moved by these keys in the indicated direction.
- <home><end> - are movement keys. These keys move the highlight or cursor to the beginning/end of a menu or selected item.
- - deletes the character sitting on the cursor.
- <backSpace> - deletes the character to the left of the cursor.
- <F7> - writes factory default settings to the adapter EEPROM.
- <enter> - this key has three functions:
 1. to display a lower-level menu;
 2. to display a parameter list;
 3. to accept the highlighted parameter.
- <F10> - saves all current changes in the selected menu.
- <esc> - discards all changes made or moves one level back to a previous menu.
- <F5> - for sizing and centering the screen in ATI extended modes. These settings can be saved to EEPROM.

Set Power-Up Configuration

1. Select "Set Video Power-up Configuration" (i.e., point to the item and press <enter>).



2. Select power-up entries as listed below one at a time, and configure them according to the requirements of your monitor, mouse, and system. If you need help, press <F1> or refer to explanations provided after this procedure. The entries you need to configure are as follows:
 - Monitor Type
 - Power-up Video Mode
 - ROM Configuration
 - Mouse Configuration
 - I/O Access

Warning

Improper monitor type selection could damage your monitor.

3. Save your configuration to EEPROM by pressing <F10>. Configuration procedure is now complete. Exit or select another function from "Main Selection Menu".

Note

If you have shadow RAM enabled in your system, you should reboot the system to reset the graphics controller and allow new parameters to take effect.

Configuration Options

Monitor Type

This setting determines what video modes will be supported on your monitor. A compatible monitor type must be recorded in the EEPROM in order for the graphics adapter to output the "best" quality image for your monitor. Refer to Chapter 3, "Monitor Selection" for information on which monitor to select. If your monitor is not listed, you should choose one that closely matches the resolution, frequency and refresh rate combination supported by your monitor.



When the Monitor Type option is selected, note in particular two options available at the bottom of your screen:

- <F7> for Defaults - returns configuration to factory settings.
- <F5> for Custom Screen - allows positioning and sizing of the display for selected resolutions. Settings are saved to the EEPROM.

Warning

The <F5> option can cause permanent damage to your screen if the monitor type selected does not match the one actually installed. Before using this feature, consult your monitor manual or call your dealer to obtain the necessary information.

If you have a dual monitor configuration, the Monitor Type selected is the monitor connected to the VGAWONDER XL. Refer to Appendix B, "Dual Monitor Installation" for further information.

Power-up Video Mode

The VGAWONDER XL can be configured to power up in VGA, EGA, CGA, MDA 720x348, or MDA 640x400 mode.

If you select the "Dual Adapter" option, you must have a second display adapter in the system.

ROM Configuration

Video ROM operation can be either 8-bit or 16-bit. You should first choose the 16-bit setting for improved performance. Choose 8-bit operation if your system experiences difficulties with 16-bit or for dual monitor systems. Some IBM compatible computers may have incompatible bus timings which will cause the card to switch to 8-bit ROM operations. This will not affect the functionality of your graphics adapter.

Mouse Configuration

Configures the Primary or Secondary address plus an IRQ level if a mouse is connected. The mouse configuration may use different I/O addresses and IRQ interrupt levels. Select one that will not conflict with an existing device.

Mouse IRQ Level	IBM AT ⁴	IBM PC, XT ⁴
2	Reserved	Open ¹
3	COM 2 & 4 ²	COM 2 & 4 ²
4	COM 1 & 3 ³	COM 1 & 3 ³
5	LPT 2 ¹	Hard Disk

¹ First choice for IRQ. ² Second choice for IRQ. ³ Third choice for IRQ.
⁴ Also includes compatibles.

I/O Access

This option is designed to optimize the performance of the VGAWONDER XL by selecting the I/O Access suitable for your system.

16-Bit

This option configures I/O Access to 16-bit. It may cause some computer systems to lock up. To correct the problem, run VINSTALL and reconfigure the mode to 8-bit.

8-Bit

This option configures I/O Access to 8-bit.

Storing the Configuration

To permanently store these selections into the **VGAWONDER XL**, press the <F10> key. If you select the escape key, and decide not to save the current configuration, the card will use the previous information in the EEPROM.

The configuration program allows you to choose the best set of parameters for your system. Its menu driven interface allows you to easily setup, change and test the **VGAWONDER XL**. If you are unsure of any options, selecting the <F1> key, will bring up a context sensitive help screen.

Set Current Video Mode

This utility is used to change the current video mode to a different mode and automatically turn your screen display off during long periods of inactivity.

Current Video Mode

To change the current video mode, select "Current Video Mode".

Each of the options can be selected by using the arrow keys to move the highlighted selection bar.

Note

Selections are for current session and do not affect EEPROM status. Selections are lost when system is turned off.

A description of each of the options follows:

VGA

Selects the VGA mode and is functional only with VGA, 8514 and Multisync monitors. Software configured for VGA will run under this mode.

EGA

Selects the EGA mode and is functional on all monitors. Software configured for EGA mode will run under this mode.

CGA

Selects the CGA mode. The **VGAWONDER XL** enhances this mode by improving the text to 8x14 and graphics are double scanned on all monitors except for RGB.

MONO TEXT 720x350

Selection of this option will put the **VGAWONDER XL** into MDA Text mode. If you are using a color monitor, you will have a choice of text colors¹.

MDA 720x348

Selects Hercules graphics mode. If you are using a color monitor, you will have a choice of text colors¹.

MDA 640x400

This option will put the **VGAWONDER XL** into a special Hercules graphics mode. Only a limited number of programs use this resolution. Use only if you have a problem with the MDA 720x348.

132x25

Selects 132 column x 25 row text mode¹.

132x44

Selects 132 column x 44 row text mode¹.

Note

132 column modes can only be used by software which is written to support 132 columns on the screen. Check your software Users Manual or call your dealer to confirm that the application will run in this mode.

80x50

Selects 80 columns by 50 rows text mode.

SCREEN SAVE

The Screen Save option (for VGA and EGA modes only) will activate a utility which will turn off the screen display after a predetermined time interval to prevent accidental phosphor etching on your monitor. The Screen Save feature is reset to "Disabled" upon power down or software reset of the system. It may be activated or deactivated at any time using VINSTALL keyword commands provided in Appendix D.

¹ Either white, amber or green.

At your option, Screen Save is automatically installed during the utility installation process.

Note

Screen Save is not compatible with graphics programs that run under the GEM or Windows environments. Select "Disabled" if you work in these environments.

Test Graphics Adapter

The "Test Graphics Adapter" option in the VINSTALL program has four options for testing the VGAWONDER XL. With the TEST program, you can display test patterns and colors for all supported video modes on the Super VGA controller. Using a menu in this program, you can do the following:

- Test monochrome modes.
- Test color modes.
- Test mouse controller and mouse connection.
- Display status information of the current operating system, adapter settings, and contents of CONFIG.SYS and AUTOEXEC.BAT files

Procedure

Before you start, make sure that you know your monitor type, as well as having successfully completed the power-up configuration function.

1. Select "Test Graphics Adapter" (i.e., point to the item and press <enter>).



2. Select a test. On menu items with ellipses (...) you will bring up sub-menus, to further specify test conditions according to monitor capabilities.
3. To conclude testing and return to the previous menu, press <esc>.

Install Adapter Utilities

The VGAWONDER XL is shipped with software utilities to change the hardware default settings and high resolution drivers to enhance the operation of graphics programs on Multisync type monitors. It is recommended that you go through the software installation process to get peak performance from your video board.

Utilities

The VGAWONDER XL disks contain the following utilities (in compressed format):

RAMBIOS.SYS ¹	- RAM version of video BIOS.
CLR.COM ¹	- clear screen utility for 132 column mode.
L43.COM ¹	- 43 line mode utility.
README	- addendum and driver installation instruction - use a word processor or DOS to examine or print.
VANSI.SYS ¹	- replaces ANSI.SYS for 132 column text modes.
VINSTALL.EXE	- see Appendix F for keyword usage.
VINSTALL.HLP	- online help for VINSTALL (<F1> key).
VVESA.COM ¹	- utility for compatibility with VESA drivers.
PRTSCRN.COM	- print screen utility for non-standard modes.
MOUSE.COM	- executable mouse driver.
MOUSE.SYS	- mouse device driver.

1. Insert disk #1 into drive A:.
2. At the A: prompt type:
VINSTALL <enter>
3. Select "Install Adapter Utilities".
4. When prompted, enter the full path name of the destination directory.

¹ Refer to the "README" file for further information.

7. The program will allow you to update CONFIG.SYS and AUTOEXEC.BAT automatically and install RAMBIOS.SYS, VANSI.SYS and MOUSE.SYS. If you are unsure, select N (NO).

Install Video Drivers

This is used to install special video drivers, for popular application software.

Insert the VGAWONDER XL Utilities and Drivers disk #1 into drive A:\.

Select "Install Video Drivers" and the following menu will be displayed:



Select the desired application for which you require drivers and follow the sub-menu instructions to complete the installation.

Note

For additional information specific to each application driver set, simply highlight the application and press <F1>.

Note

OS/2 Presentation Manager drivers and installation instructions are contained on disk #2 of your VGAWONDER XL software. Please refer to the README.PM file on disk #2 for complete instructions on installing these drivers under OS/2.

Appendix A

Video Diagnostics And Troubleshooting

The "Test Graphics Adapter" diagnostics program in the VINSTALL menu should be used when the VGAWONDER XL produces a display, but does not work properly. For example:

- does not display graphics,
- has missing characters,
- has no color,
- does not display in all modes.

Follow the menu driven instructions and a series of screens will be displayed as shown in Chapter 6. If these screens are displayed properly, the functions of the VGAWONDER XL are in good working order.

Select monochrome mode option to test monochrome attributes and mono graphics modes. Select test color mode option to test color attributes, video memory, and display resolutions. Errors, if any, are reported at the end of each test.

Note

Some modes may not be functional on the monitor you are using due to the limitations of the monitor. Refer to Table 1 - Software - Monitor Compatibility Chart in Chapter 3 for the video modes available on your monitor.

If problems are still encountered after the VGAWONDER XL passes the tests, they are most likely installation, compatibility or operation related.

Hardware compatibility related problems can be isolated by trying the VGAWONDER XL on another monitor and/or another computer as appropriate.

Installation Related Problems

No Display Problems

- **Problem:**
No display, no fan noise.
Diagnosis:
No power to computer.
Action:
Check that computer is plugged in and turned on. If the power indicator light does not come on when power is switched on, the power supply may be defective.
- **Problem:**
No display, fan noise, computer beeps (1 long and 2 short tones)
Diagnosis:
Video card not recognized.
Action:
Check installation. See Chapter 6. Check that the **VGAWONDER XL** is properly seated in the slot. Check PC ROM BIOS date (IBM PC only). Get new BIOS if earlier than 10/27/82.
- **Problem:**
No display, computer beeps once, floppy drive light flashes on and goes off.
Diagnosis:
Computer works, signal not reaching monitor, possible defective monitor.
Action:
Check monitor; is it switched on and monitor cable connected properly.
Turn up monitor brightness and contrast controls.
Turn monitor off and on, then reboot system. Try monitor on another system.

- **Problem:**
No display, dual monitor configuration.
Diagnosis:
Incorrect installation.
Action:
Check installation, run VINSTALL. If problem not solved, remove other video card and install **VGAWONDER XL** as single monitor setup to confirm operation before attempting dual monitor configuration.
- **Problem:**
Rolling screen; loss of sync.
Diagnosis:
Certain modes may not operate on certain monitors.
Action:
Try a different monitor selection using VINSTALL. Check your monitor specification for support at the required frequencies listed in the ATI specifications. If the mode is supported, and colors or patterns are missing, the card may be defective.

Error Messages

- **Problem:**
Error message - 'Invalid configuration press F1 to continue.'
Diagnosis:
Incorrect configuration file, or dead AT battery.
Action:
Run AT diagnostics software, install for EGA or No Display; reboot; problem should disappear; power down, if problem appears on power up again, battery is dead.

Operational Problems

- **Problem:**
Screen goes blank in Windows, GEM or games.
Diagnosis:
Program incompatible with SCREEN SAVE.
Action:
Disable SCREEN SAVE.

- **Problem:**
Software does not work or garbage appears on screen and system hangs.
 - Diagnosis:**
Software mode incorrect or not supported by monitor.
 - Action:**
Use VINSTALL to change mode to match what software is installed for. Check that mode is supported by your monitor.
 - Diagnosis:**
Possible device driver or memory resident program conflict.
 - Action:**
Disable programs by unloading them from memory or by renaming the AUTOEXEC.BAT file to *.BAK and CONFIG.SYS to *.BAK and reboot. If the problem disappears, there is a conflict with one of your programs.
 - Diagnosis:**
Monitor may not switch modes without resetting.
 - Action:**
Reset monitor by turning it off and on.
- **Problem:**
Memory resident programs (i.e. SideKick) work when initially loaded, but not later when needed.
 - Diagnosis:**
Current video mode different from installation of TSR program.
 - Action:**
Use VINSTALL to switch mode to whatever the TSR program (i.e. SideKick) is installed for.
- **Problem:**
Programs vary in screen size.
 - Diagnosis:**
Programs may be using different video modes.
 - Action:**
Adjust the horizontal and vertical height controls on your monitor.

- **Problem:**
Junk characters on screen or system halts with nothing but cursor on screen. VGAWONDER XL configured for 16-bit ROM operation.
 - Diagnosis:**
System is not compatible with 16-bit ROM operation.
 - Action:**
If system is still working, use VINSTALL to select 8-bit ROM operation. If system will not work, install VGAWONDER XL in an 8-bit slot and use VINSTALL to select 8-bit ROM operation. The card can then be reinstalled in a 16-bit slot.
- **Problem:**
System will not boot or acts strangely after installing the ATI software. System will work fine if booted from floppy drive with plain DOS disk.
 - Diagnosis:**
Changes to CONFIG.SYS file in root directory of hard drive causing problems.
 - Action:**
Edit CONFIG.SYS with EDLIN or any other ASCII editor. If using ATI RAMBIOS device driver, make sure that the line "DEVICE = C:\VGAUTIL\RAMBIOS.SYS" is the first device driver loaded. If there is more than one line loading the RAMBIOS.SYS and/or the MOUSE.SYS device drivers, delete the duplicated lines.
- **Problem:**
Mouse not operational.
 - Diagnosis:**
Mouse driver not loaded or incorrectly configured.
 - Action:**
Ensure that the mouse is securely plugged into the circular port on the VGAWONDER XL. Use VINSTALL to check the installation of the mouse driver as outlined in Appendix C. Use VINSTALL to ensure that the bus mouse is enabled and that the correct address is selected. Run Test Graphics Adapter to test the operation of the mouse.

Customer Support Form

Before calling the Customer Support Department at ATI Technologies Inc. record the information on the following forms. Have it available when talking to one of our representatives. If you write, please complete both pages of the following report and mail to the address given on the back of this manual or fax to (416) 756-0720.

Note

Run VINSTALL and fill in the information from the Diagnostics and System Information program. ATI Technologies Inc. will be unable to process your call without this information.

Name: _____

Address: _____

Phone No.: _____ Fax No.: _____

Serial No.: _____

Version: BIOS¹: _____ Software²: _____

Type & Model of Computer: _____

Type & Model of Monitor: _____

Other Add-on Boards Installed & Versions: _____

Memory Board: _____ Driver Version: _____

Network Software and Version: _____

1 BIOS Version Number can be displayed by using VINSTALL "Test Graphics Adapter".

2 Software Version Number can be found on the diskettes.

System Information

DOS Version: _____

System ROM Date: _____

Contents of AUTOEXEC.BAT: _____

Contents of CONFIG.SYS: _____

List the Steps to Recreate the Problem:

The ATI Customer Support Department hours:

Monday to Friday: 9:30 a.m. - 5:30 p.m. E.S.T.

Telephone: (416) 756-0711

Facsimile: (416) 756-0720

Bulletin Board Service: (416) 756-4591

Appendix B

The **VGAWONDER XL** must be installed in an 8-bit slot for dual monitor configurations. When using the **VGAWONDER XL** in dual monitor operation, one monitor must be in a color mode and the other monitor must be in a monochrome mode.

The **VGAWONDER XL** will co-exist with 3 types of video cards: either an MDA, Hercules or CGA card. **VGAWONDER XL** cannot be installed with another EGA or VGA card. See Chapter 2 for pin orientation.

You must select which card will be primary video card (the card on which the system boots).

Dual Monitor Installation

Primary Card

The **VGAWONDER XL** is automatically the primary card in all modes except EGA. In EGA mode, it may be either primary or secondary.

If you plan to use the **VGAWONDER XL** as the primary card, you must configure the **VGAWONDER XL** according to the following configurations:

Primary Card (VGAWONDER XL)	Secondary Card
VGA all color modes	MDA
VGA all mono modes	CGA
EGA (CE80) for EGA text ¹	MDA
EGA (C80) for CGA text ¹	MDA
EGA (M80) ² for monochrome text ¹	CGA
CGA	MDA
MDA	CGA

¹ Chosen by selecting EGA-Dual monitor.

² The **VGAWONDER XL** powers up as an MDA card. You must specify a foreground color.

Secondary Card

To use the **VGAWONDER XL** as the secondary card use **VINSTALL** and select EGA - Dual Monitor. The following combinations are possible:

Primary Card	Secondary (VGAWONDER XL)
MDA	EGA (CE80)
MDA	EGA (C80)
CGA	EGA (M80) ¹

¹ The **VGAWONDER XL** powers up as an MDA card.

To change between the primary and secondary card, use the mode command in DOS. At the DOS prompt type:

```
A:>VINSTALL MODE[KEYWORD] <enter>
```

where keyword is CO80 or MONO.

Note

In dual monitor configurations, **VINSTALL** can change the current mode. However, the **VGAWONDER XL** cannot emulate MDA or Hercules if an MDA or Hercules card is installed in the system. Similarly, the **VGAWONDER XL** cannot emulate EGA or CGA if a CGA card is installed in the system. It is not recommended to use the **VGAWONDER XL** with a CGA card since all of its color modes would be disabled. Ensure 8-bit I/O Access is selected during Set Power-Up Configuration for any dual adapter configuration.

Appendix C

Mouse Installation And Driver Selection

To install the mouse:

1. Insert mouse ball into compartment in bottom of mouse.
2. Plug bus mouse into mouse port on **VGAWONDER XL**.
3. Configure the mouse port. See VINSTALL, "Set Video Power-Up Configuration".
4. Install mouse driver (see below).
5. Use Test Graphics Adapter from VINSTALL to test mouse.
6. Configure your software applications for mouse support. Some applications do not support a mouse directly, but may do so using external software.

The driver disk contains two different mouse drivers - MOUSE.SYS and MOUSE.COM.

MOUSE.SYS is a device driver installed by selecting VIDEO UTILITIES within VINSTALL. This procedure alters the CONFIG.SYS file on your boot drive and is activated every time you boot your system. Keywords can be used with MOUSE.SYS (except for the OFF option).

MOUSE.COM is an executable program used to install a resident mouse driver if MOUSE.SYS is not already installed. It can be used to change the existing mouse configurations.

To enable the mouse with MOUSE.COM type:

```
MOUSE [keyword(s)] [/Pn] [/Sn] <enter>
```

where optional keyword(s) are:

- [HELP] - Displays current status and command syntax of the mouse driver.
- [STATUS] - Same as HELP.
- [OFF] - Disables the mouse driver. If MOUSE.COM was installed rather than MOUSE.SYS and MOUSE.COM was the last resident program installed, 10K of memory will be released.

The following keywords can only be used during initial installation:

- [3BUTTONS] - Configures the mouse driver for a 3 button mouse. This is the default unless [2BUTTONS] is used.
- [2BUTTONS] - Configures the mouse driver for a 2 button mouse. Only use if your physical mouse has only 2 buttons.

The PROFILE and SENSITIVITY of the mouse are selected as follows:

- /Pn - Sets the ballistic profile,
 n = 1 (slow),
 2 (moderate, this is the default setting),
 3 (fast),
 4 (unaccelerated).
- /Sn - Sets the sensitivity, n = 1 to 100. The default setting is 50. Higher numbers indicate increased sensitivity.

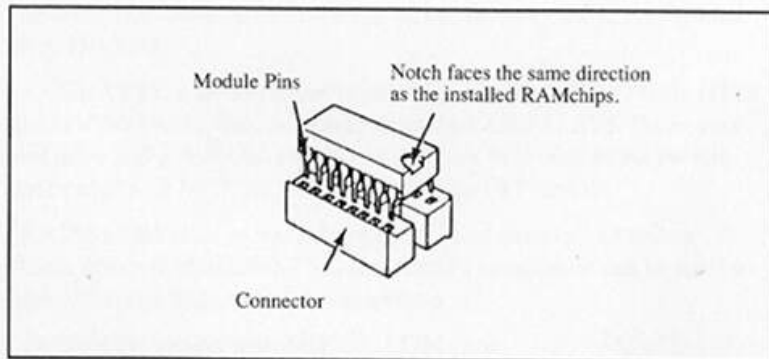
These changes are for the current session only. They may be entered in your AUTOEXEC for repeated use.

Appendix D

Memory Upgrade

To upgrade the memory to 1.0MB, it is required that you use one of the following DRAM chip types: Part number uPD424256-80 or uPD424256-70 from NEC; TC514256-80 or TC514256-70 from Toshiba; or TMS44C256-80 from Texas Instruments or KM44C256BP-8 from Samsung; or HY53C4256-80 from Hyundai.

Install the DRAM chips in the empty sockets on the left hand side of the **VGAWONDER XL** board (see block diagram in Chapter 2). Install 4 pieces of DRAM to expand from 512K to 1.0MB. Care should be taken to ensure that the key on the chip indicated by a notch at one end, as shown below, is installed in the same direction as the other DRAM chips adjacent to the chips you are installing. After installation, inspect each chip carefully for bent pins or reverse insertion.



Warning

DRAM chips are static sensitive devices. Discharge any static electricity by grounding yourself to the chassis of the PC before handling the chips.

To check that the DRAM chips installed are in working order, run "Test Graphics Adapter". Select "Test Color Modes". If a problem exists with the upgraded memory, it will be reported here.

Appendix E

Monitor Selection

The monitor chosen in VINSTALL for the Analog Monitor Selection menu will determine which resolutions and refresh rates are available. If your monitor appears in the Analog Monitor Selection table, choose it as your Analog Monitor; if your monitor does not appear, check your Owner's Manual to determine the maximum resolution your monitor can display. Choose your Monitor as follows:

Maximum Monitor Resolution	Analog Monitor Selection
1024x768 Non-interlaced	NEC XL/PLUS/4D/5D or Sony CPD-1304
1024x768 Interlaced	MULTISYNC/TVM 4A (60Hz Multisync)
1024x768 (8514 compatible)	PS/2 8514
800x600 (H- V-)	MULTISYNC ¹
800x600 (H+ V+)	NEC 3D ¹
640x480 (VGA color)	PS/2 COLOR
640x480 (VGA mono)	PS/2 MONO

In addition to the resolution support, the **VGAWONDER XL** supports a variety of 60, 70 and 72Hz refresh rates, provided your monitor can support the faster vertical scan rates. For the higher resolution modes, your monitor choice will also determine the vertical refresh rate used. The **VGAWONDER XL** will always use the fastest refresh rate supported by your monitor.

Select the monitor that matches your monitor and exit VINSTALL.

On some computers, 70Hz/72Hz operation may cause a decrease in video performance. If this occurs, use 60Hz refresh.

The following table shows which monitor selections support 60Hz, 70Hz and 72Hz refresh rates and in which modes:

Vertical Sync Frequencies Based on Monitor Selection

Monitor ¹	Resolution	640x480	800x600	1024x768
NEC 3D (default) NEC 3D/70		60Hz (H- V-) 72Hz (H+ V+)	56Hz (H- V-) 60Hz (H+ V+)	87Hz I 87Hz I
NEC 4D/5D (default) NEC 4D/5D/70 NEC 4D/5D/72		60Hz (H- V-) - 72Hz (H- V-)	60Hz (H+ V+) 70Hz (H+ V+) 72Hz (H+ V+)	60Hz (H- V-) NI 70Hz (H- V-) NI 72Hz (H- V-) NI
Sony CPD-1304 (default) Sony CPD-1304/70		60Hz (H- V-) 72Hz (H+ V+)	60Hz (H- V-) 72Hz (H+ V+)	60Hz (H- V-) NI 60Hz (H- V-) NI
TVM 4A (60Hz Multisync)		60Hz (H- V-)	60Hz (H+ V+)	87Hz I

default = original setting, /70 = 70Hz setting, /72 = 72Hz setting

- 1 Consult your monitor owner's guide to determine its polarity. If your choice does not work properly, try the opposite polarity (- = negative polarity; + = positive polarity; H = horizontal; V = vertical; NI = non-interlaced; I = interlaced).
- 2 H- V- or Composite - V -

Appendix F

Keywords

The following keywords are supported by the VINSTALL program. These keywords affect the current video mode only. To use them, simply type VINSTALL followed by the desired mode.(e.g. A:\>VINSTALL VGA Color <enter>) For details on each mode, refer to the charts on the following pages.

- VGA Color - Select VGA compatibility mode and color, 9x16 text.
- VGA Mono - Select VGA compatibility mode and monochrome, 9x16 text.
- EGA Color - Select EGA compatibility mode and color EGA (8x14) text.
- EGA Mono - Select EGA compatibility mode and monochrome EGA (9x14) text.
- CGA - Select CGA compatibility mode and color CGA(8x8) text.
- H720 - Select MDA/Hercules compatibility mode and MDA/EGA (9x14) text.
- H720 Amber - Same as H720 but select amber foreground color.
- H720 Green - Same as H720 but select green foreground color.
- H720 White - Same as H720 but select white foreground color.
- H640 - Select MDA/Hercules (640x400) mode and MDA/EGA (9x14) text.
- H640 Amber - Same as H640 but select amber foreground color.
- H640 Green - Same as H640 but select green foreground color.
- H640 White - Same as H640 but select white foreground color.
- 25 - Select 132x25 text but retain its current color mode.
- 44 - Select 132x44 text but retain its current color mode.
- M132x25 - Select monochrome 132x25 text.
- M132x44 - Select monochrome 132x44 text.
- C132x25 - Select color 132x25 text.
- C132x44 - Select color 132x44 text.
- ROM 8/16 bits - 8/16 bits ROM operation.
- Nohelp - Do not load help file.
- Help - List commands to configure current video mode.

Mode	Box Size	Pels	Colors	Hor. Sync (kHz)	Vert. Sync (Hz)	H/V Polarities	Dot Clock (MHz)
0+/VGA	9x16	360x400	16/256K	31.47	70	-/+	28.3
1+/VGA	9x16	360x400	16/256K	31.47	70	-/+	28.3
0*/EGA	8x14	320x350	16/64	31.47	70	+/-	25.2
1*/EGA	8x14	320x350	16/64	31.47	70	+/-	25.2
0/CGA	8x8	320x200	16	31.47	70	-/+	25.2
1/CGA	8x8	320x200	16	31.47	70	-/+	25.2
2+/VGA	9x16	720x400	16/256K	31.47	70	-/+	25.2
3+/VGA	9x16	720x400	16/256K	31.47	70	-/+	25.2
2*/EGA	8x14	640x350	16/64	31.47	70	+/-	25.2
3*/EGA	8x14	640x350	16/64	31.47	70	+/-	25.2
2/CGA	8x8	640x200	16	31.47	70	-/+	25.2
3/CGA	8x8	640x200	16	31.47	70	-/+	25.2
4/VGA	8x8	320x200	4/256K	31.47	70	-/+	25.2
4/EGA	8x8	320x200	4/64	31.47	70	-/+	25.2
4/CGA	8x8	320x200	4 (2 sets)	31.47	70	-/+	25.2
5/VGA	8x8	320x200	4/256K	31.47	70	-/+	25.2
5/EGA	8x8	320x200	4/64	31.47	70	-/+	25.2
5/CGA	8x8	320x200	4 (2 sets)	31.47	70	-/+	25.2
6/VGA	8x8	640x200	2/256K	31.47	70	-/+	25.2
6/EGA	8x8	640x200	2/64	31.47	70	-/+	25.2
6/CGA	8x8	640x200	2	31.47	70	-/+	25.2
7+/VGA	9x16	720x400	2/256K	31.47	70	+/-	28.3
7/EGA	9x14	720x350	2/64	31.47	70	+/-	28.3
7/MDA	9x14	720x350	Mono	31.47	70	+/-	28.3
D/VGA	8x8	320x200	16/256K	31.47	70	-/+	25.2
D/EGA	8x8	320x200	16/64	31.47	70	-/+	25.2
E/VGA	8x8	640x200	16/256K	31.47	70	-/+	25.2
E/EGA	8x8	640x200	16/64	31.47	70	-/+	25.2
F/VGA	8x14	640x350	2/256K	31.47	70	+/-	25.2
F/EGA	8x14	640x350	2/64	31.47	70	+/-	25.2
10/VGA	8x14	640x350	16/256K	31.47	70	+/-	25.2
10/EGA	8x14	640x350	16/64	31.47	70	+/-	25.2
11/VGA	8x16	640x480	2/256K	31.47	60	-/-	25.2
12/VGA	8x16	640x480	16/256K	31.47	60	-/-	25.2
13/VGA	8x8	320x200	256/256K	31.47	70	-/+	25.2
Hercu1	-	720x348	Mono	31.47	70	+/-	28.3
Hercu2	-	640x400	Mono	31.47	70	-/+	25.2
ATI-23	8x16	1056x400	16/64	31.47	70	-/+	40
ATI-27	8x16	1056x400	Mono	31.47	70	-/+	40
ATI-33	8x8	1056x352	16	31.47	70	-/+	40
ATI-37	8x8	1056x352	Mono	31.47	70	-/+	40
ATI-54	8x14	800x600	16/256K	35.16	56.25	-/-	36

Mode	Box Size	Pels	Colors	Hor. Sync (kHz)	Vert. Sync (Hz)	H/V Polarities	Dot Clock (MHz)
ATI-54V	8x14	800x600	16/256K	35.16	56.25	+/+	36
ATI-55I	8x16	1024x768	16/256K	35.52	86.9	+/+	45
ATI-55	8x16	1024x768	16/256K	47.75	58.5	-/-	65
ATI-61	8x16	640x400	256/256K	31.47	70	-/+	25.2
ATI-62	8x16	640x480	256/256K	31.47	60	-/-	25.2
ATI-63	8x14	800x600	256/256K	35.16	56.25	-/-	36
ATI-63V	8x14	800x600	256/256K	35.16	56.25	+/+	36
ATI-64I	8x16	1024x768	256/256K	35.52	86.9	+/+	45
ATI-64	8x16	1024x768	256/256K	47.75	58.5	-/-	65
ATI-65I	8x16	1024x768	16/256K	35.52	86.9	+/+	45
ATI-65	8x16	1024x768	16/256K	47.75	58.5	-/-	65
ATI-67I	8x16	1024x768	4 (4 sets)	35.52	86.9	+/+	45
ATI-67	8x16	1024x768	4 (4 sets)	47.75	58.5	-/-	65
ATI-72	8x16	640x480	32K	31.47	60	-/-	50.4
ATI-73	8x14	800x600	32K	37.88	60.32	-/-	80
ATI-73V	8x14	800x600	32K	37.88	60.32	+/+	80

I - Interlaced Mode

V - Applicable to VESA compatible monitors.

Appendix G

DL-Xpress/386 Installation

DL-Xpress/386 is a display list software driver designed to improve the performance of AutoCAD 386 Release 10 and 11 by increasing the speed at which AutoCAD display commands are executed by as much as 1000%.

DL-Xpress/386 is also designed to improve the user's satisfaction with AutoCAD by providing various methods for controlling the menu colors and display quality.

DL-Xpress/386 is also a protected-mode ADI driver designed to improve the user interface of other Autodesk products by implementing the full resolution of your graphics board and monitor and by providing the means to customize many of the presentation parameters.

DL-Xpress is for use with Autodesk protected-mode applications only, such as:

- AutoCAD 386 Releases 10 & 11
- AutoShade 2.0 386
- Autodesk RenderMan
- Autodesk 3D Studio 1.0

Key Features

The most important features to our DL-Xpress users include:

- Accelerated pan, zoom, and view commands.
- Auto GC Trigger that prevents display lists from growing inappropriately and causing excessive swapping.
- Fast Figure Drag for precise object placement during move and copy commands.
- Use of extended and expanded memory via AutoCAD's virtual memory manager, thereby avoiding memory space conflicts.
- Smooth Line Mode for sharper lines on the screen by using anti-aliasing techniques.
- Full 32-bit performance for all drawing operations.
- Protected-mode design allows it to become an integral part of the application and requires none of the 640K DOS RAM.
- Full color configuration, palette customization and font selection when appropriate.

System Requirements

To run DL-Xpress/386 your computer system must be capable of running the intended Autodesk protected mode application and you must own a graphics board listed in the video card selection section of DL-Xpress.

When DL-Xpress is being set up to run AutoCAD 386, we strongly recommend the use of additional memory. Autodesk recommends running AutoCAD 386 with at least 4.0MB of memory, (though the program is able to crawl with only 2.0MB).

We strongly recommend more than 4.0MB of memory to run at optimal performance with drawings over 400K in AutoCAD.

Rule of Thumb

A good rule of thumb is to have as much additional memory for DL-Xpress, over that in which AutoCAD 386 normally runs, by one third the size of your average drawing for each viewport you have active.

For example, if you work on 1.0MB drawings and AutoCAD runs satisfactorily on a 6.0MB system, you would need about 6.33MB of memory to comfortably run the system with one viewport open. However, since extended memory does not generally come in fractional increments, in reality you would need a total of 8.0MB.

Before Installing DL-Xpress/386

A Note to Experienced Users

DL-Xpress is compatible with all of Autodesk's other protected-mode driver installation methods. Feel free to use another method if you prefer.

If you are running more than one copy of AutoCAD on a system or want to run DL-Xpress from a network server, see the documentation on using the DSPADICFG Environment Variable in the README file contained on your program disk.

A Note to AutoShade & 3D Studio Users

For those of you wanting to run DL-Xpress/386 with either AutoShade 2.0 or 3D Studio 1.0, follow the installation and configuration instructions contained in the README file on your installation disk.

About the README File

Located on your installation diskette, there is a README file which contains additional information about DL-Xpress/386. This includes:

- Detailed installation instructions for DL-Xpress/386 with 3D-Studio and AutoShade.
- Complete discussions about each Custom Configuration option.
- Further information about anti-aliasing and DL-Xpress' Smooth Line mode.
- Trouble Shooting
- Using the DSPADI environment variable.

The file is called README.DLX (ASCII text). To print it use DOS's PRINT command.

Configuration and Usage for AutoCAD

DL-Xpress replaces any other display drivers that you have installed for use with AutoCAD. DL-Xpress supports many video cards and all of its features are customizable to meet your individual tastes.

Configuration

In order to have AutoCAD use DL-Xpress as its display driver we'll have to go through several steps.

Selecting DL-Xpress as Display

1. Enter AutoCAD as usual, either through a batch file, menu, or by typing ACAD at the DOS prompt.
2. If you've configured AutoCAD in the past, enter the Configure AutoCAD function and opt to change the video display configuration. If AutoCAD has not previously been configured, the system will automatically ask you to select your video driver. In either case, select 1. ADI P386 display.

Video Card Selection

3. After selecting the ADI P386 display driver, the DL-Xpress logo screen will automatically appear followed by a window showing your current video mode. The system asks:
Do you wish to change the video mode?
4. The default is the ATI VGA 1024 x 768, 256 color card/mode. Remember that AutoCAD only works in 16 and 256 color modes. To leave the software set for that video card & mode, select No by typing N or pressing <enter>. Then continue with configuration.

To change the video card, select Yes by typing Y.

5. When choosing a new card, a list of possible selections appears.
6. Highlight the appropriate card using the arrow keys and press <enter>.

Note

You may wish to select an anti-aliased mode. This mode smooths out slanted lines by filling in the stairstep-jaggie effect.

Testing the Video Card Selection

1. Next, DL-Xpress will display the name of the selected card and ask:
Do you wish to test the video mode?
2. If you answer N for No, the system proceeds with the next phase, Accepting/Modifying DL-Xpress Defaults, outlined in the next section.

If you answer Y, Yes, and the video card is correct, a test screen should appear.

If your screen is blank or garbled characters appear, there is a problem with the video card or your monitor doesn't support the particular resolution selected.

3. After about 10 seconds the following message appears:
Did the Graphics Test Screen appear correct?
4. If everything is correct, answer Y, Yes, and continue with the next section, Accepting/Modifying DL-Xpress/386 Defaults.

If the screen was not satisfactory, answer N, No, and you will be returned to the video card selection screen. Follow the same instructions starting with step 7 under Video Card Selection.

If none of the selections you want to use work, call us at (416) 756-0711 so we can fix the problem.

Accepting/Modifying DL-Xpress/386 Defaults

1. Next, a screen appears showing the default settings for the following:
 - Single or Dual Screens
 - Number of Command Lines

- Zoom Button Number
- Overall View Button Number

The screen asks:

Do you wish to change any of the above settings?

2. Answer N, No, if the parameters are appropriate and proceed with Exiting Configuration/AutoCAD Defaults.

Answer Y, Yes, if you wish to change anything. Then continue below.

Single or Dual Monitors

Dual screens let you use one display for graphics while using another display for AutoCAD's command prompts. The default is single monitor.

3. Type S or D as appropriate.

If you select dual monitors, be aware that we have several dual screen operating modes available. The default mode of FAST operation is appropriate 95% of the time. See the Custom Configuration section located in the README file on your program disk for details and instructions.

Number of Command Lines

Select from 0 to 25 lines to appear at the bottom of the graphics screen. The fewer the lines the faster the scroll rate. Using 0 is only appropriate with dual monitors.

4. Type the number and press <enter>.

Entering Custom Configuration

1. After dealing with the defaults, DL-Xpress will ask:
Do you wish to enter Custom Configuration?
2. You may type Y for yes and enter Custom Configuration. If you type N, you may enter Custom Configuration, described in detail in the README file located on your program disk, at anytime from the AutoCAD command line by typing DLXCONFIG.

Please see the section on Custom Configuration for complete instructions on customizing the following parameters for use with AutoCAD:

- Auto GC Trigger Value
- Menu Color Scheme
- Font Selection
- Number of Status Lines

- Palette Selection
- Operational Parameters

Exiting Configuration/AutoCAD Defaults

1. After responding to the screen options on the previous pages, DL-Xpress will take you back to AutoCAD Configuration. AutoCAD will ask you about the following:
 - Aspect Ratio
 - Status Line
 - Command Prompt
 - Screen Menu Area

Aspect Ratio

2. Press <enter> or change as appropriate.

In general, it is better to adjust the monitor than to try changing this.

Status Line

3. Press <enter> or change as appropriate.

Command Prompt

By answering N, No, to this prompt, it will override the number of command lines set previously in DL-Xpress Defaults.

4. Press <enter> or Y to answer Yes to this prompt.

Screen Menu Area

5. Press <enter> or change as appropriate.
6. Exit the Configure AutoCAD function. Be sure to answer Y, Yes, to save your changes.
7. Your basic configuration is now complete. Enter the drawing editor.

Usage with AutoCAD

While using DL-Xpress/386 you can access all of the regular AutoCAD zooming and panning commands normally. Each redraw, zoom, pan or view restore command that doesn't require a regen will be accelerated by DL-Xpress. DL-Xpress also provides the following unique additional functions.

Keyboard Commands

All DL-Xpress's functions can be accessed by typing one or more keyboard commands. These commands can also be entered at almost any AutoCAD command prompt by prefixing them with an apostrophe, such as 'RD.

DL-Xpress Functions

The following functions are included in DL-Xpress/386

- Redraw
- Redraw All
- Garbage Collection
- Garbage Collection All
- Help
- Status
- Custom Configuration

Each of these functions will be examined in greater detail on the following pages.

Note

You may wish to turn off AutoCAD's REGENAUTO command so that AutoCAD will ask you to confirm any zoom that would cause a regen.

Redraw

Vibrant Graphics has added a familiar shorthand for initiating AutoCAD redraws in an active viewport.

To quickly start a Redraw:

1. Type: `RD <enter>`

Redraw All

An extension to the Redraw command is Redraw All which initiates a Redraw in every viewport.

To Redraw All:

1. Type: `RDALL <enter>`

Garbage Collection

Sometimes while performing a zoom, recently erased objects will flash on the screen. Another problem occurs when a solid object is placed over a part of the drawing, then erased. When you perform a zoom, that part of the drawing will appear to be missing. Use the Garbage Collection command to solve both of these problems.

The Garbage Collection command gets a new display list from AutoCAD that has been purged of erased objects. It is used when the AutoCAD REGEN command will take too long and the Auto GC Trigger Value has not been exceeded.

To initiate Garbage Collection:

1. Type: `GC <enter>`

This command could take a moment.

Garbage Collection All

This command requests a new display list for each viewport on the screen, not just the active one.

To initiate Garbage Collection All:

1. Type: `GCALL <enter>`

Note

Be sure to see the discussion of the Auto GC Trigger Value in the Custom Configuration section of the README file located on your installation disk.

Help

Help screens are available for DL-Xpress. To access these screens:

1. Type: `DLXHELP <enter>`
2. To exit the Help section, press <esc>.

Status

The Status function shows the amount of memory in use by the DL-Xpress display list.

To access the Status function:

1. Type:

DLXSTATUS <enter>

Custom Configuration

Please see the section on Custom Configuration for complete instructions on customizing the following parameters for use with AutoCAD:

- Auto GC Trigger Value
- Menu Color Scheme
- Font Selection
- Number of Status Lines
- Palette Selection
- Operational Parameters

To reach Custom Configuration from within AutoCAD:

1. Type:

DLXCONFIG <enter>

International Usage

Non English Version of AutoCAD

Several of DL-Xpress's commands work by sending AutoCAD the words REDRAW or REDRAWALL.

If you are using a non-english version of AutoCAD, several of DL-Xpress's commands will not work.

To solve this problem, you may define the REDRAW and REDRAWALL words that are sent to AutoCAD by using the REDRAW and REDRAWALL environment variables.

For example, the French version of AutoCAD will require the following environment variables:

```
SET REDRAW=REDESS
```

```
SET REDRAWALL=REDESTOUT
```

Do not place any spaces after the definitions.

Specifications

System Requirements: IBM PC/XT/AT/386/483, PS/2 Model 30/35/40 or compatible system. 640K conventional memory and hard disk recommended.

Bus: IBM PC or AT standard, 8- or 16-bit slots.

Video Display Buffer: VGAWONDER XL 512: 512K video memory, upgradeable to 1.0MB. **VGAWONDER XL 1.0MB:** 1.0MB video memory.

Video Display Modes: See Software/Monitor Compatibility Chart for monitor support.

Sync Signals: Separate horizontal and vertical sync at TTL levels in all modes. Composite sync is available in RGB Television modes.

Horizontal	Vertical	Resolution
57.9 kHz	72.0Hz	1024x768 (NI)
56.5 kHz	70.0Hz	1024x768 (NI)
48.4 kHz	60.0Hz	1024x768 (NI)
48.0 kHz	72.0Hz	800x600 (NI)
44.2 kHz	70.0Hz	800x600 (NI)
37.9 kHz	60.0Hz	800x600 (NI)
37.7 kHz	72.0Hz	640x480 (NI)
35.5 kHz	87.0Hz	Multisync & 8514 monitors 1024x768 (I)
35.2 kHz	56.0Hz	Multisync monitors 800x600 (NI)
33.8 kHz	96.0Hz	8514 monitors 800x600 (I)
31.5 kHz	70.0Hz	640x400 (NI)
31.5 kHz	60.0Hz	640x480 (NI)

Sync signals for VGA monitors conform to IBM standard.

NI - non-interlaced, I - interlaced

Video Memory Address: A0000 - BFFFF

Video BIOS Address: C0000 - C7FFF

Video Port Address: 3B0 - 3DF, 1CE, 1CF

Connectors: *Analog Video:* 15 pin D shell (female) IBM standard.

Mouse: 9 pin circular connector Microsoft mouse compatible. *Digital Video:* 9 pin D shell (female) IBM standard.

Mouse Port Address: 23Ch-23Fh or 238h - 23Bh software selectable.

Mouse Interrupt: IRQ 2-5 or none.

Monitor Compatibility: IBM PS/2 85XX analog monitors. Multisync and other monitors compatible with above standards.

Size: 4.2" (W) x 6.25" (D).

Power: +5V +/-5%, @ 500mA typical.
+12V @ 16mA typical.
-12V @ 12mA typical.

Environment

Ambient Temperature: 50° to 122° F (10° to 50° C) operation.
32° to 162° F (0° to 70° C) storage.

Relative Humidity: 5% to 90% non-condensing operation.
0% to 95% storage.

Bus Loading: No more than 2 LS TTL load.

MTBF: 100,000 hrs.

Warranty: Five (5) year limited warranty.

Connector Specifications

DB15 Analog Monitor Connector

Pin No.	Signal
1	Red
2	Green
3	Blue
5	Self Test
6	Red Return
7	Green Return
8	Blue Return
10	Digital Gnd
11	Digital Gnd
13	Hsync ¹
14	Vsync

¹ Composite if selected in RGB Television modes.

Mouse Connector

Pin No.	Signal
1	+5V
2	XA
3	XB
4	YA
5	YB
6	SW1
7	SW2
8	SW3
9	Ground
E	Chassis Ground

DB9 Digital Monitor Connector

Pin No.	Signal
1	Ground
2	Secondary Red/Ground
3	Primary Red
4	Primary Green
5	Primary Blue
6	Secondary Green/Intensity
7	Secondary Blue/Mono Video
8	Horizontal Retrace
9	Vertical Retrace

Hardware Warranty

ATI Technologies Inc. warrants that the hardware product is in good working condition, according to its specifications at the time of shipment, for a period of five (5) years from the date of purchase. Should the product, in ATI Technologies Inc.'s opinion, malfunction within the warranty period, ATI Technologies Inc. will repair or replace the product without charge. Any replaced parts become the property of ATI Technologies Inc. This warranty does not apply to the software component of a product or a product which has been damaged due to accident, misuse, abuse, improper installation, usage not in accordance with product specifications and instructions, natural or personal disaster or unauthorized alterations, repairs or modifications.

Limitations

All warranties for this product, expressed or implied, are limited to five (5) years from the date of purchase and no warranties, expressed or implied, will apply after that period.

No warranties for this product, expressed or implied, shall extend to any person who purchases the product in a used condition.

The liability of ATI Technologies Inc. in respect of any defective product will be limited to the repair or replacement of such product. ATI Technologies Inc. may use new or equivalent to new replacement parts.

ATI Technologies Inc. makes no other representations or warranties as to fitness for purpose, merchantability or otherwise in respect of the product. No other representations, warranties or conditions, shall be implied by statute or otherwise.

In no event shall ATI Technologies Inc. be responsible or liable for any damages arising

- (a) from the use of the product;
- (b) from the loss of use, revenue or profit of the product; or
- (c) as a result of any event, circumstance, action or abuse beyond the control of ATI Technologies Inc.;

whether such damages be direct, indirect, consequential, special or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.

Warranty Service

Units requiring repair under warranty require an RMA number. To obtain service under this warranty, first contact:

ATI Technologies Inc.
Customer Support
Telephone: (416) 756-0711
Facsimile: (416) 756-0720

or by writing:

ATI Technologies Inc.
Customer Support
3761 Victoria Park Avenue
Scarborough, Ontario
Canada M1W 3S2

and request a Return Material Authorization Number (RMA). This number must be clearly displayed on the unit's external packaging. Units shipped without an RMA number will not be accepted. Include with the unit, proof of purchase (including date of purchase), a note outlining the problem, and the RMA number.

Product should be sent to:

ATI Technologies Inc.
Service Centre
60 Valleybrook Drive
Don Mills, Ontario
Canada M3B 2S9

Important

When shipping your unit, pack securely and ship prepaid and insured. ATI Technologies Inc. will not be held liable for damage or loss to the product in shipment.

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NOTES

Warranty Registration Card

Customer Support is only available to registered users. Please complete the Warranty Card and return within 30 days of purchase. Proof of purchase including date and place of purchase must accompany product returned for service. A five year limited warranty is provided by ATI Technologies Inc.

VGAWONDER XL Warranty Registration Card

Configuration: 256K 512K 1.0MB

Name: _____ Serial No. (see back of the card): _____
 Title: _____ Purchase Date: ____/____/____ Price: _____
 Company: _____ Purchased From: _____
 Address: _____ Address: _____

City _____ State/Province _____ Telephone _____
 Zip/Postal Code _____ Zip/Postal Code _____ Telephone _____

1. I've decided to buy because of:
- Price Driver Support
 - High Res. Analog/Digital Monitors
 - Compatibility Dealer Recommendation
 - Brand Name Availability
 - 32,768 Colors Other: (specify) _____

2. Resolutions used:
- 1024x768
 - 800x600
 - 640x480 (VGA)
 - Below VGA (specify) _____

3. Monitor used:
- Brand: _____
 - Model: _____
 - Mono Color
 - Digital
 - VGA, Analog 8514
 - Multisync

4. I read:
- PC Magazine
 - PC World
 - PC Week
 - InfoWorld
 - Other: (specify) _____

5. My Principal Software Applications are:
- 1. _____
 - 2. _____
 - 3. _____

6. I heard about this product from:
- Dealer
 - Referral
 - Trade Show
 - Ad in: (specify) _____

7. Do you use:
- Modem-Mdl: _____
 - Brand: _____
 - Fax - Mdl: _____
 - Brand: _____
 - Plan to Buy: _____
 - Modem Fax



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