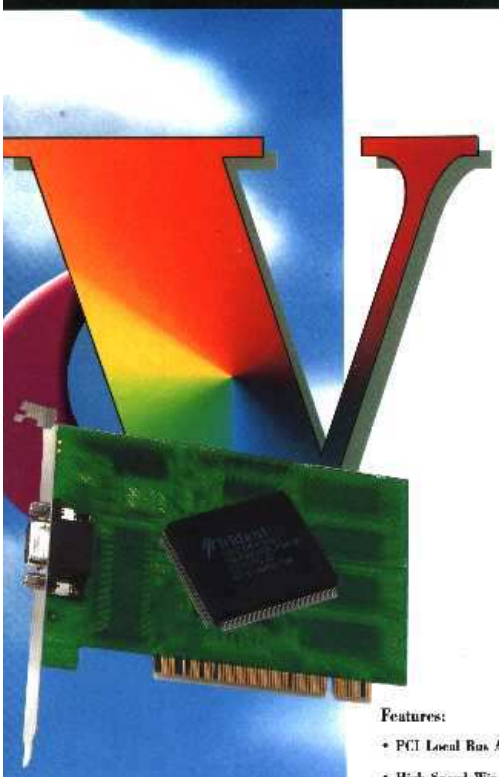
VIDEO GRAPHICS ADAPTER



Features:

- PCI Local Bus Architecture
- High Speed Windows Accelerator
- Supports up to 2MB of display memory
- High Vertical Refresh Rate
- Green PC Compatible
- VGA Compatible to the Register Level

PCI-Bus Accelerator

PCI-Bus VGA Accelerator

Features:

PCI-Bus

100% register level and BIOS compatible with IBM AT, and VGA graphics standards, emulating VESA VGA, EGA,CGA,MDA and Hercules.

Configurations Available:

- 2MB on Board

VGA PCI-Bus Accelerator

Features:

Interfaces:

- 64-bit DRAM based PCI Bus Video Graphics Adapter
- VESA Feature Connector
- 15-pin Analog Connector
- 64-bit DRAM Display Memory Interface
- True color accelerator
- 16-bit pixel address RAMDAC
- True Packed Pixel and Linear Addressing
- 8, 15, 16 and 24-bit peer pixelcolor expansion
- Write posting of CPU write video memory.
- Processes two 32-bit/pixel (bpp), 16 bpp or eight 8 bpp

Chip:

- TGUI9440AGi Graphic Accelerator Engine

Resolution and Color Selection

- Supports 640x480 in 16, 256, 32K, 64K, and 16M colors
- Supports 800x600 in 16, 256, 32K, 64K, and 16M* colors
- Supports 1024x768 in 16, 256, 32K**, and 64K* colors (interlaced and non-interlaced)
- Supports 1280x1024 in 16 and 256• colors interlaced

* These modes require 2 megabytes of display memory.
** These modes require 45 nanosecond or faster display memory.

Compatibility

- 486SX/DX and Pentium PCI systems
- Register compatible with EGA and VGA
- VESA compatible
- DPMS for Green PC power saving
- Non-interlaced or interlaced monitor support
- Compatible with Multi-Scanning and PS/2 monitors
- 1024x768 75Hz refresh

Software Drivers Supports:

- AutoCAD™
- VersaCAD
- Lotus
- MS Word
- OS/2 Presentation Manager™
- WordPerfect
- VESA BIOS Extension (for VESA Standard SVGA drivers)
- Autoshade™
- GEM Desktop
- MS Windoes
- Symphony
- Ventura
- SCO
- Quattro Pro

Mode	Type	Colors/ Shades	Alpha Format	Cell Size	Screen Format
50	Text	16/256k	80×30	8×16	640×480
51	Text	16/256k	80×43	8×11	640×473
52	Text	16/256k	80×60	8×8	640×480
53	Text	16/256k	132×25	8×14	1056×350
54	Text	16/256k	132×30	8×16	1056×480
56	Text	16/256k	132×43	8×11	1056×473
58	Text	16/256k	132×60	8×8	1056×480
57	Text	16/256k	132×25	9×14	1188×350
59	Text	16/256k	132×30	9×16	1188×450
69	Text	16/256k	132×43	9×11	1188×473
5A	Text	16/256k	132×60	9×8	1188×480
5B	Graphics	16/256k	100×75	8×8	800×600
5C	Graphics	256/256k	80×25	8×16	640×400
5D	Graphics	256/256k	80×30	8×16	640×480
5E	Graphics	256/256k	100×37	8×16	800×600
AF	Graphics	16/256k	128×48	8×16	1024×768
60	Graphics	4/256k	128×48	8×16	1024×768
61	Graphics	16/256k	96×64	8×16	768×1024
62	Graphics	256/256k	128×48	8×16	1024×768
63	Graphics	16/256k	160×64	8×16	1280×1024
64	Graphics	256/256k	160×64	8×16	1280×1024
6B	Graphics	16M	40×25	8×8	320×200
6C	Graphics	16M	80×30	8×16	640×480
6D	Graphics	16M	100×75	8×8	800×600
70/71	Graphics	32k or 64k	512×480	8×16	512×480
74/75	Graphics	32k or 64k	640×480	8×16	640×480
76/77	Graphics	32k or 64k	800×600	8×16	800×600
78/79	Graphics	32k or 64k	128×48	8×16	1024×768

4.2 Extended Video Modes

Mode	Type	Colors/ Shades	Alpha Format	Cell Size	Screen Format
0,1	Text	16/256k	40×25	8×8	320×200
0*,1*	Text	16/256k	40×25	8×14	320×350
0+,1+	Text	16/256k	40×25	9×16	360×400
2,3	Text	16/256k	80×25	8×8	720×200
2*,3*	Text	16/256k	80×25	8×14	640×350
2+,3+	Text	16/256k	80×25	9×16	720×400
4,5	Graphics	4/256k	40×25	8×8	320×200
6	Graphics	4/256k	80×25	8×8	640×200
7	Text	4	80×25	9×14	720×350
7+	Text	4	80×25	9×16	720×400
D	Graphics	16/256k	40×25	8×8	320×200
E	Graphics	16/256k	80×25	8×8	640×200
F	Graphics	4	80×25	8×14	640×350
10	Graphics	16/256k	80×25	8×14	640×350
11	Graphics	2/256k	80×30	8×16	640×480
12	Graphics	16/256k	80×30	8×16	640×480
13	Graphics	256/256k	40×25	8×8	320×200

* Line Draw druws a solid color or a two-colors straight line of any slope in display memory.
* Short Stroke Vector Draw draws a solid color or a two-colors straight lines in one of the eight octants, each line is defined only by its direction and length.
* Hardware Cursor (64x64x2 or 32x32x2 pixel image) acceleration provides an enhanced "look and feel", as well as a 5-10% performance gain for lowering software and CPU overhead with moving the cursor.

1.5 Extended Display Resolution

* 80-column text modes in 25, 30, 43 and 60 rows
* 132-column text modes in 25,30, 43 and 60 rows
* 640x480 in 16, 256, 32K, 64K, and 16M colors
* 800x600 in 16, 256, 32K, and 64K colors
* 1024x768 in 16 and 256 colors (interlaced and non-interlaced), and 1280x1024 in 16 colors with 1MB DRAM
* 1024x768 in 64K colors, and 1280x1024 in 256 colors(interlaced and non-interlaced) with 2MB DRAM

SECTION 2 SOFTWARE DRIVERS

2.1 Software Drivers Supported

The TGUI9440AGi supports following drivers and other VGA compatible applications using their respective software drivers.

* Microsoft Windows
* Microsoft NT
* Microsoft Word
* WordPerfect
* Wordstar
* Framework
* OS/2
* AutoCAD
* Autoshade
* Ventura
* Lotus
* Symphony
* P-CAD
* VersaCAD
* CADKEY
* Quattro-Pro
* Chicago
* SCO X-Windows

SECTION 3 HARDWARE CONFIGURATION

3.1 Hardware/Memory Configuration

Chip Set : Trident TGUI9440AGi

Memory : 1MB or 2MB display memory configuration with memory densities of 256Kx4, and/or 256Kx16

SECTION 4 ENHANCED VIDEO MODES

4.1 Standard Video Modes

SECTION 1 INTRODUCTION

Thank you for purchasing our Trident TGUI9440AGi Graphic User Interface(GUI) Accelerator. The TGUI9440AGi accelerator is a highly integrated, DRAM-based, graphic CRT controller for PCI-Bus interface. It provides a flexible, low cost, high performance solution for a diverse range of color depth, CRT resolution, and display memory configurations. The TGUI9440AGi's highly innovative system design and full acceleration graphics engine dramatically improves GUI functions and enhances overall system operation.

1.1 Complete Hardware Compatibility

* Third pin-to-pin compatible member of the TGUI94xx family
* PCI rev 2 compliant
* Supports VESA DDC and VAFC standards
* 100% IBM VGA compatible on BIOS, register, and hardware level
* 208-pin PQFP package

1.2 Highly Integrated Design

* Fully integrated 24-bit true-color DAC with color look-up table, 108 MHz programmable clock synthesizer, 100% IBM compatible VGA core, and GUI accelerator
* 256x18 color look-up table with HiColor and true color bypass mode support, dual loop memory, and video clock
* Two wire interface to EEPROM or VESA DDC

1.3 "Deep Green PC" Power Management

* VESA Display Power Management Signaling (DPMS) compatible
* Simple RAMDAC powerdown and clock idle register interface
* Complete shut down and full recovery

1.4 Accelerated Graphics Functions - GUI functions

The TGUI9440AGi significantly boosts graphics performance through hardware that accelerates the most frequently used GUI operations. These functions allow significant performance increases over standard Super VGA designs, providing graphics acceleration in graphic intensive environments such as MS Windows, Windows NT, IBM OS/2 PM, and the Solaris X-Windowing System. The GUI functions include:

* Accelerated Color Expansion Modes
* BitBLT is the operation that moves blocks of data within the display memory. It dramatically improves Windows performance. It provides several types of BitBLT operations, including Pixel Block Transfer, Pattern Block Transfer, and Color Expanded Block Transfer.
* 256 Raster Operations(ROPs) for 8-bit per pixel(pseudo color) and 15-/16-bits per pixel(HiColor) graphic modes.
* Image and Text Transfer allow the source pixel data come from the system memory rather than the Graphics Engine, which reduces system CPU overhead operation and improves image and text transfer functions.
* Area Fill fills a destination block area in display memory with either a solid color, a two-colors style, or 8x8 pattern block. It is commonly used to fill in the background color for windows or the screen area behind a window.

Super VGA

TGUI9440AGi

- for PCI Bus

USER'S MANUAL

VER 1.01

PRINTED IN U.S.A.

Table 2-2: extended VGA mode support (Cont'd)

Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req	Text Res	Mode Type	TV Out
65h_2	1600x1200-16	75	60	1M	200x75	Graph	
65h_1	1600x1200-16	62.5	96i	1M	200x75	Graph	
66h_2	1600x1200-256	75	60	2M	200x75	Graph	
66h_1	1600x1200-256	62.5	96i	2M	200x75	Graph	
6Ah_1[1]	800x600-16	37.8	60	1M	100x75	Graph	
6Bh	640x400-16M	31.4	70	1M	80x25	Graph	N,P
6Ch_4	640x480-16M	43.2	85	1M	160x60	Graph	
6Ch_3	640x480-16M	37.5	75	1M	160x60	Graph	
6Ch_2	640x480-16M	37.8	72	1M	160x60	Graph	
6Ch_1	640x480-16M	31.4	60	1M	160x60	Graph	N,P
6Dh_3	800x600-16M	53.7	85	2M	200x74	Graph	
6Dh_2	800x600-16M	46.8	75	2M	200x74	Graph	
6Dh_1	800x600-16M	37.8	60	2M	200x74	Graph	P
72/3h	640x400-32K/64K	31.4	70	1M	80x25	Graph	
74/5h_4	640x480-32K/64K	43.2	85	1M	160x30	Graph	N,P
74/5h_3	640x480-32K/64K	37.5	75	1M	160x30	Graph	N,P
74/5h_2	640x480-32K/64K	37.8	72	1M	160x30	Graph	N,P
74/5h_1	640x480-32K/64K	31.4	60	1M	160x30	Graph	N,P
76/7h_4	800x600-32K/64K	53.7	85	1M	200x37	Graph	P
76/7h_3	800x600-32K/64K	46.8	75	1M	200x37	Graph	P
76/7h_2	800x600-32K/64K	37.8	60	1M	200x37	Graph	P
78/9h_5	1024x768-32K/64K	68.7	85	2M	128x96	Graph	
78/9h_4	1024x768-32K/64K	60.0	75	2M	128x96	Graph	
78/9h_3	1024x768-32K/64K	56.4	70	2M	128x96	Graph	
78/9h_2	1024x768-32K/64K	48.3	60	2M	128x96	Graph	
78/9h_1	1024x768-32K/64K	35.5	87i	2M	128x96	Graph	

NOTES: 1. VESA mode. Same as 5Bh_1.
2. The "i" in the vertical frequency column denotes "interlaced". The "N" and "P" in the TV Out column denote "NTSC" and "PAL", respectively.

2.4 Advanced Topics

The adapter supports a variety of video modes (standard VGA and higher resolution) which are accessible through a video BIOS call from assembly language or other higher-level programming languages.

When you start up in DOS, the screen display defaults to the standard 80 column text (alpha-numeric) mode. This is mode 03H on a color system, or mode 07H on a monochrome VGA system.

2.5 Hardware Troubleshooting

The following are some recommended steps to take if the GUI accelerator adapter will not boot or operate properly in your system:

1. Ensure that the monitor or TV brightness and contrast controls are properly adjusted.
2. Check to see if your monitor or TV is properly connected to the card. Be sure your monitor's pin definitions match those of your GUI accelerator card . For TV out, ensure that the composite signal is connected to a "Video Input" RCA jack on the TV (or check the S-video connection). Read the TV owner's manual to select the proper signal jack for the display.
3. Turn the system on and confirm that the power supply is operating properly; i.e., that the fan operates and the system power light turns on.
4. Check to see if the card is firmly seated in its PCI bus expansion slot. It should not be making contact with any other cards in the system. **Note:** Turn the system off before adjusting the card.

2.2 Connecting the Monitor

The adapter offers a standard VGA 15-pin analog connector. When you connect your monitor to the adapter, be sure you have the right cable and cable connector. Fixed-frequency analog monitors come equipped with a 15-pin connector. Variable frequency analog or analog/digital monitors will require a 9-to-15 pin cable connector.

The adapter also offers a S-video jack and a composite (RCA) jack for connecting an NTSC/PAL TV. Use either jack for TV out, but the S-video jack will provide a higher quality signal.

2.3 Monitor Support for Enhanced VGA Modes

Your monitor must be capable of displaying the mode you choose. The table 1 list all available VGA display modes for the adapter, the monitors which support them, TV out display modes, plus other information that may be useful.

Note that the color palette, i.e. the total number of possible colors to choose from, is 16,777,216 in all modes except for monochrome modes (designated by the letter 'M') where the color palette is 2: black and the monitor phosphor color. For example, in mode 62 (1024x768-256 colors), the total colors available for display on the monitor at one time is 256 different colors from a palette of 16,777,216. In mode 6C (640x480-16M colors), the total colors available for display on the monitor at one time is 16,777,216; i.e. 24 bit true color.

The adapter's video modes include all of the following:

Table 2-1: Standard VGA Mode Support

Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req	Text Res	Mode Type	TV Out
0h,1h	360x400-16	31.4	70	1M	40x25	Text	N,P
2h,3h	720x400-16	31.4	70	1M	80x25	Text	N,P
4h,5h	320x200-4	31.4	70	1M	40x25	Graph	N,P
6h	640x200-2	31.4	70	1M	80x25	Graph	N,P
7h	720x400-Mono	31.5	70	1M	80x25	Text	N,P
Dh	320x200-16	31.4	70	1M	40x25	Graph	N,P
Eh	640x200-16	31.4	70	1M	80x25	Graph	N,P
10h	640x350-16	31.4	70	1M	80x25	Graph	N,P
11h	640x480-2	31.4	60	1M	80x30	Graph	N,P
12h	640x480-16	31.4	60	1M	80x30	Graph	N,P
13h	320x200-256	31.4	70	1M	40x25	Graph	N,P

Table 2-2: Extended VGA mode support

Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req	Text Res	Mode Type	TV Out
50h	640x480-16	31.5	60	1M	80x30	Text	
51h	640x473-16	31.5	60	1M	80x43	Text	
52h	640x480-16	31.5	60	1M	80x60	Text	
53h	1056x350-16	31.3	70	1M	132x25	Text	
54h	1056x480-16	31.3	60	1M	132x30	Text	
55h	1056x473-16	31.3	60	1M	132x43	Text	
56h	1056x480-16	31.3	60	1M	132x60	Text	
57h	1188x350-16	31.3	70	1M	132x25	Text	
58h	1188x480-16	31.3	60	1M	132x30	Text	
59h	1188x473-16	31.3	60	1M	132x43	Text	
5Ah	1188x480-16	31.3	60	1M	132x60	Text	
5Bh_3	800x600-16	53.7	85	1M	100x75	Graph	
5Bh_2	800x600-16	46.8	75	1M	100x75	Graph	
5Bh_1	800x600-16	37.8	60	1M	100x75	Graph	P
5Ch	640x400-256	31.6	70	1M	80x25	Graph	N,P
5Dh_4	640x480-256	43.2	85	1M	80x30	Graph	
5Dh_3	640x480-256	37.5	75	1M	80x30	Graph	
5Dh_2	640x480-256	37.8	72	1M	80x30	Graph	
5Dh_1	640x480-256	31.4	60	1M	80x30	Graph	N,P
5Eh_3	800x600-256	53.7	85	1M	100x37	Graph	
5Eh_2	800x600-256	46.8	75	1M	100x37	Graph	
5Eh_1	800x600-256	37.8	60	1M	100x37	Graph	P
5Fh_4	1024x768-16	60.4	75	1M	128x48	Graph	
5Fh_3	1024x768-16	56.4	70	1M	128x48	Graph	
5Fh_2	1024x768-16	48.5	60	1M	128x48	Graph	
5Fh_1	1024x768-16	35.5	87i	1M	128x48	Graph	
62h_5	1024x768-256	68.7	85	1M	128x48	Graph	
62h_4	1024x768-256	60.0	75	1M	128x48	Graph	
62h_3	1024x768-256	56.4	70	1M	128x48	Graph	
62h_2	1024x768-256	48.3	60	1M	128x48	Graph	
62h_1	1024x768-256	35.5	87i	1M	128x48	Graph	
63h_3	1280x1024-16	80.0	75	1M	160x64	Graph	
63h_2	1280x1024-16	63.9	60	1M	160x64	Graph	
63h_1	1280x1024-16	46.4	87i	1M	160x64	Graph	
64h_3	1280x1024-256	80.0	75	2M	160x64	Graph	
64h_2	1280x1024-256	63.9	60	2M	160x64	Graph	
64h_1	1280x1024-256	46.4	87i	2M	160x64	Graph	