

# NEXTSTEP for Intel Processors

**Title:** ATI Ultra Pro Graphics Adapter

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**Product Vendor:**

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## Overview:

The ATI Ultra Pro displays up to 1120 x 832 16 bit color graphics or 1280 x 1024 8 bit grayscale under NEXTSTEP. This card is available in both EISA and VESA localbus versions. The VESA Localbus version ATI Ultra Pro will provide faster graphics due to the faster bus interface. Both EISA and VESA Localbus versions support up to two megabytes of video RAM.

Update 1 of the ATI display adapter device driver is now available for NEXTSTEP 3.1 from NeXTanswers via anonymous FTP (<ftp.next.com>) or email ([nextanswers@next.com](mailto:nextanswers@next.com)). Request

document numbers 1341\_ATIDriver.pkg.compressed and 1340\_ATIDriverReadMe.rtf. This update provides enhanced functionality and several systems on the Hardware Compatibility Guide require it to utilize their full graphics potential under NEXTSTEP. This driver is available on the 3.2 User CD.

**System Support in Update 1 of the ATI Display Adapter Device Driver**

**ATI 68800 Display Adapters**

System	8-bit Grayscale	16-bit Color
ATI Graphics Ultra Pro - EISA with either an ATI68875 or TI 34075 RAMDAC	800 x 600 1MB VRAM 60 or 72 Hz	800 x 600 1MB VRAM 60 Hz
	1024 x 768 1MB VRAM 60, 72, or 76 Hz	1024 x 768 2MB VRAM 60 or 76 Hz
		1120 x 832 2MB VRAM 60 or 68 Hz
	1120 x 832 2MB VRAM 60 or 68 Hz	
	1280 x 1024 2MB VRAM 60 Hz	
ATI Graphics Ultra Pro - VESA with an ATI68875	800 x 600 1MB VRAM 60 or 72 Hz	800 x 600 1MB VRAM 60 Hz
	1024 x 768 1MB VRAM 60, 72, or 76 Hz	1024 x 768 2MB VRAM 60 or 76 Hz
		1120 x 832 2MB VRAM 60 or 68 Hz
	1120 x 832 2MB VRAM 60 or 68 Hz	
	1280 x 1024 2MB VRAM 60 Hz	

**ATI 68800 Systems**

System	8-bit Grayscale	16-bit Color
Intel GX/Professional with a TI 34075 RAMDAC	1024 x 768 1MB VRAM 60, 72, or 76 Hz	800 x 600 1MB VRAM 60 Hz
	1120 x 832 2MB VRAM 60 or 68 Hz	1024 x 768 2MB VRAM 60 or 76 Hz
	1280 x 1024 2MB VRAM 60 Hz	
Data General Dasher DE2 with a TI 34075 RAMDAC	1024 x 768 1MB VRAM 60, 72, or 76 Hz	800 x 600 1MB VRAM 60 Hz
	1120 x 832 2MB VRAM 60 or 68 Hz	1024 x 768 2MB VRAM 60 or 76 Hz
	1280 x 1024 2MB VRAM 60 Hz	
AST Premmia 4D with a BT 481 RAMDAC	1024 x 768 1MB VRAM 60 or 72 Hz	800 x 600 1MB VRAM 60 Hz

## Setup and Installation:

The NEXTSTEP driver automatically sets all of the necessary parameters as specified in Configure. It is not necessary to run the MS-DOS version of the ATI configuration software when working with either of these cards under NEXTSTEP.

In Configure, the 'width' and 'height' parameters are the width and height of the display in pixels. The 'refresh' parameter is the refresh rate of the monitor in Hz. The 'colorspace' parameter is of the form 'BW:x' where 'x' is the number of bits/pixel, or 'RGB:xyz/w' where 'x', 'y', and 'z' are the number of bits/component and 'w' is the number of bits/pixel.

### Release 3.3

See NeXTanswers document 1763\_ATI\_Driver\_Overview.rtf

# Known Problems:

## Releases 3.1 and 3.2:

- Gateway bundles a custom version of the ATI Ultra Pro, the XLR, with their systems. This card works with fewer video modes of the NEXTSTEP ATI Ultra Pro driver than does the standard version of the adapter. The maximum resolution the NEXTSTEP Release 3.2 ATI Ultra Pro driver supports with the XLR is 800 x 600 in 16 bit color.
- Avoid system configurations combining an Adaptec 1542C and ATI Ultra EISA card. A hardware conflict exists which causes data corruption on SCSI hard disks.
- The ATI driver limits 16 bit color to 800 x 600 if it detects certain low-end DAC chips, such as the Bt481 and ATT20C491. These DACs have a clock limit of 80 MHz, and an 8 bit data path into the chip, requiring special clocking of the pixel data for 16 bit operation. 16 bit color operation is restricted to 800 x 600 non-interlaced at 60 Hz refresh rate to avoid running the DAC at clock rates exceeding the manufacturer's rated specification. 8 bit gray scale operation is available up to 1024 x 768 non-interlaced at 76 Hz.

Operation may also be restricted to 800 x 600 16 bit color resolution if only 1 Mb of VRAM is detected on a board. In this case, 8 bit gray scale modes up to 1120 x 832 may work, as these all require 1 Mb or less frame buffer memory.

- NeXT has received multiple inquiries regarding the system requirements to support 1120 x 832 16 bit color. If you have the correct ATI Mach-32 chip revision, RAMDAC, video RAM bandwidth and monitor this mode will work. Otherwise a variety of video problems may exist.

## ATI Mach32 Chip versions

Older ATI Ultra Pro boards, and systems which integrate the ATI Mach32 chip into a custom localbus implementation, may be based on the ATI 68800-3 Mach32 chip (revision three). This chip is not capable of supporting 16 bits per pixel NEXTSTEP video output for scan lines longer than 1024 pixels. If the display appears to have periodic video 'noise' down the left or right side at all times, then the system almost certainly has the older Mach32 chip, and does not support 1120 x 832 color. As of this writing, NeXT knows of no reliable way to differentiate between the older 68800-3 chips and the newer versions from the NEXTSTEP driver environment.

## **RAMDAC Capabilities**

The TI34075 or ATI 68875 (B or C) RAMDAC is required to support scanlines longer than 1024 pixels. The 1280 x 1024 60Hz non-interlaced display format requires a 110 MHz dot clock. Higher refresh rates are not supported, as they would exceed the clock limits for the 68875B or TI34075-110 RAMDACs used in most ATI Ultra Pro boards, resulting in thermal excursions beyond maximum ratings and irreversible damage to the RAMDAC.

## **Video Memory Systems**

Some video display systems may not reserve sufficient bandwidth for the video memory to RAMDAC data path. These systems may show sparkling or video dropout when large numbers of burst reads are done from the video memory by the CPU. This effect is most visible when dragging windows.

The severity of the sparkling or video dropouts can be reduced by selecting a lower refresh rate (e.g., 60 Hz instead of 68 Hz) or a different resolution display.

## **Monitor Capabilities**

Before selecting higher resolution or higher refresh rate configurations, you should verify that your monitor is capable of synchronizing with the video signal. Refer to your monitor's manual for details.

For example, the NEC 4FG monitor cannot synchronize with the 1280 x 1024 non-interlaced 60 Hz signal produced by the highest resolution grayscale setting (Its documented maximum is 1024 x 768 @ 70 Hz.). Many 'generic' SVGA monitors cannot synchronize with 800 x 600 non-interlaced signals beyond a 60 Hz refresh rate.

The horizontal and vertical timing used by NeXT's ATI display adapter device drives match VESA guidelines and standards for all VESA modes. Note that 1120 x 832 resolution is not a VESA standard or guideline mode. Some displays may be incapable of synchronizing with this video signal.

The limiting factor in supporting a specific mode on a given display is usually the horizontal retrace rate, or frequency. The ATI Ultra Pro device driver generates the following horizontal frequencies for the specified formats and vertical frequencies.

Format	Horizontal Frequency	Vertical Frequency
800 x 600	37.879 KHz	60 Hz
1024 x 768	48.363 KHz	60 Hz
1024 x 768	57.870 KHz	72 Hz
1024 x 768	61.350 KHz	76 Hz
1120 x 832	53.042 KHz	60 Hz
1120 x 832	59.025 KHz	68 Hz
1280 x 1024	63.953 KHz	60 Hz

Before selecting a display mode, make sure that the horizontal frequency lies within the range your monitor can handle.

Symptoms of exceeding a monitor's capabilities include:

Wildly distorted images

Horizontal instability and tearing

No picture

NEXTSTEP does not support interlaced displays.