

DIGITAL PowerStorm 4D51T GFX Graphics Option

Installation Guide

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- Reorient 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

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Preface

Guide Overview

The *DIGITAL PowerStorm 4D51T GFX Graphics Option Installation Guide* provides general information on the PowerStorm 4D51T GFX graphics option and the modules that make up this graphics option. This information is independent of hardware platform. For specific information regarding your hardware platform, refer to your system documentation.

Audience

This guide is for individuals who install and use the PowerStorm 4D51T GFX graphics option.

Organization

The *DIGITAL PowerStorm 4D51T GFX Graphics Option Installation Guide* is organized as follows:

Chapter 1, Introduction, provides a description of the PowerStorm 4D51T GFX graphics option and the modules that make up this graphics option.

Chapter 2, Installation, provides information for installing the PowerStorm 4D51T GFX graphics option in Intel systems running Windows NT.

Appendix A, Monitor Resolutions, lists resolutions for software supported multi-synch monitors.

Appendix B, Specifications, lists the physical and environmental specifications, video output characteristics, and stereo output characteristics.

Appendix C, For DIGITAL Service Use, provides a list of Field Replaceable Units (FRUs).

Conventions

The following conventions are used in this guide:

Convention	Meaning
Caution	Cautions provide information to prevent damage to equipment or software. Read these carefully.
Important	Important notations provide information to allow your system to work properly.
Note	A note calls the reader's attention to important information.
WARNING	A warning contains information essential to the safety of personnel.

Reader's Comments

DIGITAL welcomes your comments on this or any other manual. You can send your comments to DIGITAL in the following ways:

- Internet electronic mail: *reader-comments@digital.com*
- Mail:

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For additional information, call 1-800-DIGITAL.

1

Introduction

Description

The DIGITAL PowerStorm 4D51T GFX graphics option for Intel systems consists of a PowerStorm 4D51T graphics accelerator module and a DSP-based GFX geometry accelerator module connected by a 60-pin Vertex data bus ribbon cable.

The PowerStorm 4D51T graphics accelerator is a PCI local bus module that generates high-resolution, 3-dimensional (3D) color graphics. Application programs can utilize these graphics to render mechanical and electrical CAD, molecular modeling, scientific visualization, simulation, animation, and other graphical information.

The GFX geometry accelerator module employs a direct burst interface as the PCI bus interface device and contains 4 MB of onboard direct burst memory. This allows burst transfers on the PCI bus and reduces main memory bus traffic. The GFX module also contains seven 32-bit floating point digital signal processors (DSPs) operating in parallel that are capable of executing 840 million floating-point operations per second (MFLOPS). This removes geometry processing from the CPU to speed up on-screen dynamics.

The PowerStorm 4D51T GFX graphics option offers the following features and functions:

- Performance of up to 1.2 million triangles per second (3D, Z-buffered, 25 pixel, Gouraud shaded).
- Support for Windows NT graphics -- Graphic Device Interface (GDI) and OpenGL.
- Support for resolutions up to 1.3 megapixels (1280 x 1024).
- Support for graphics features such as Gouraud shading, 2D and 3D vectors and triangles, texture processing, rectangle fills, antialiased vectors, clipping, alpha blending, fog, and stenciling.
- 16 MB of Synchronous Dynamic RAM (SDRAM) frame buffer memory.

Introduction

- Video plane sets of 100 bits per pixel (at 1280 x 1024), 128 bits per pixel (up to 1152 x 864), and four video lookup tables.
- 10-bit gamma correction.
- 24- or 32-bit double-buffering and 24-bit Z-buffering.
- Peripheral Component Interconnect (PCI) interface with direct memory access (DMA).
- Integrated VGA video support.
- Support for multi-sync monitors.
- Hardware support for video in a window, stereoscopic viewing, Display Data Channel (DDC), and Display Power Management Signaling (DPMS).
- Hardware acceleration for the following graphics features:
 - Model View matrix transformation of vertex and normal coordinates
 - Texture matrix transformation of texture coordinates
 - Full lighting calculations with up to eight light sources
 - Up to six user clip planes
 - Perspective transformation
 - Viewport transformation
 - View volume clipping

Contents of Your Order

Your order includes the following items:

- PowerStorm 4D51T graphics accelerator module
- GFX geometry accelerator module
- 60-pin Vertex data bus ribbon cable
- *DIGITAL PowerStorm 4D51T GFX Graphics Option Installation Guide*
- *Graphics Support Services Software for Microsoft Windows NT Installation and User Guide for Intel Systems*
- Antistatic wriststrap

Software

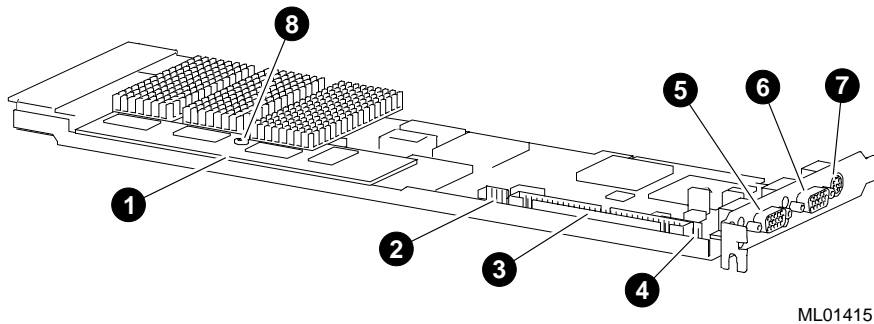
The minimum software version levels that are compatible with the PowerStorm 4D51T GFX graphics option. Are:

- Windows NT, Version 4.0 SP3
- Graphics Support Services Software, Version 4.6

PowerStorm 4D51T Module

The PowerStorm 4D51T graphics accelerator module is shown in Figure 1-1.

Figure 1-1 PowerStorm 4D51T Module



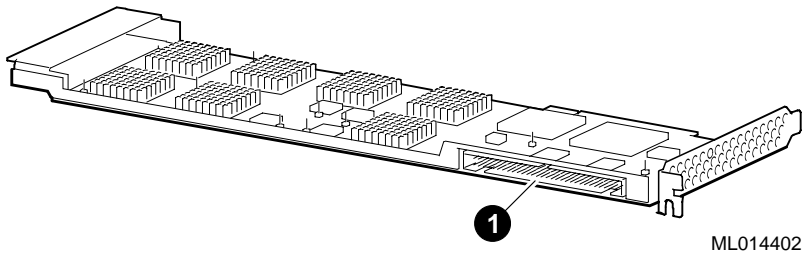
- | | |
|----------------------------------|--|
| ❶ Texture memory (16 MB) | ❺ VGA pass-through connector (black) for separate VGA module |
| ❷ Not currently used | ❻ Video cable connector (blue) to monitor |
| ❸ Vertex data bus connector | ❼ Stereo sync output connector |
| ❹ VGA enable/disable jumper pins | ❽ Texture memory module retaining screw |

Introduction

GFX Module

The GFX geometry accelerator module is shown in Figure 1-2.

Figure 1-2 GFX Module



- ❶ Vertex data bus connector

2

Installation

Procedure

The installation of the PowerStorm 4D51T GFX graphics option can be accomplished in a few easy-to-do steps. Each step presumes that you are familiar with your hardware platform. For specific information regarding your hardware platform, refer to your system documentation.

Preparing for Installation

To install the PowerStorm 4D51T GFX graphics option in your system, follow these steps:

1. Turn off the power to the system and any external devices. Disconnect any external devices and cables, and unplug the power cord from the wall outlet.
2. Remove the system unit cover, and unscrew and remove the two metal filler plates that are present for the adjacent PCI slots that you have selected for installing the PowerStorm 4D51T GFX graphics option. Remove adjacent filler plates for ease of installation. Save the screws that secured the metal filler plates; you will need them later to secure the module to the enclosure.

Note

The two adjacent PCI slots selected for installing the PowerStorm 4D51T GFX graphics option *must* be located on the same PCI bus for the option to function properly. Refer to your system documentation for additional information.

Installation

Caution

The PowerStorm 4D51T graphics accelerator and the GFX geometry accelerator modules must be installed in PCI slots that provide adequate airflow for full-length PCI modules.

Caution

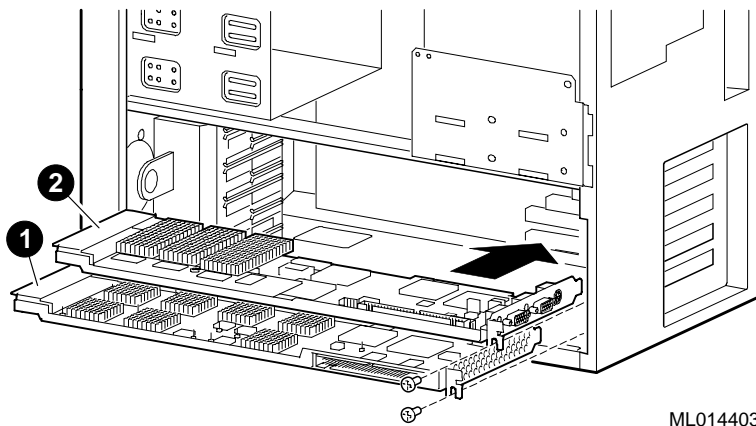
To avoid damage to the module from static discharge, wear the antistatic wriststrap (part number 12-36175-01) when handling the module. Instructions for use are on the wriststrap's envelope.

Completing the Installation

To complete the installation of the PowerStorm 4D51T GFX graphics option, follow these steps:

1. Align the PowerStorm 4D51T module ❷ with one of the selected PCI slots (see Figure 2-1).
2. Push the PowerStorm 4D51T module firmly into the PCI socket.
3. Insert the screw (removed from the filler plate in an earlier step) and secure the module to the enclosure (see Figure 2-1).
4. Align the GFX module ❶ with the remaining selected PCI slot (see Figure 2-1).
5. Push the GFX module firmly into the PCI socket.
6. Insert the screw (removed from the filler plate in an earlier step) and secure the module to the enclosure (see Figure 2-1).

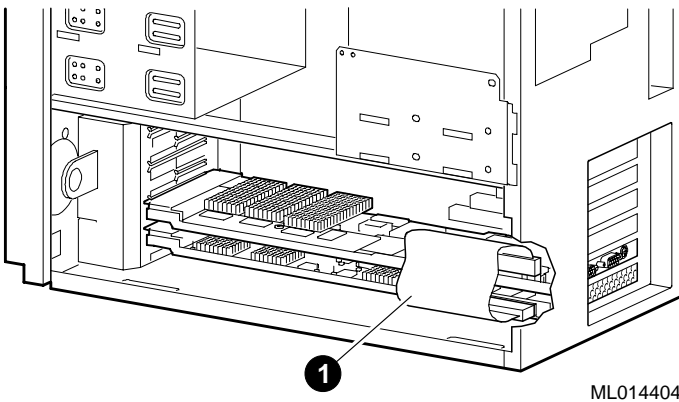
Figure 2-1 Installing the Option Modules



Installation

7. Connect the Vertex data bus ribbon cable ❶ between the Vertex data bus connectors on the PowerStorm 4D51T module and the GFX module (see Figure 2-2).

Figure 2-2 Connecting the Vertex Data Bus Ribbon Cable



8. Replace and secure the cover to the system unit. Attach all external devices and cables that were previously removed.
9. Connect the video cable to the video cable port (blue bulkhead connector) on the PowerStorm 4D51T module.
10. Connect your video monitor as described in your system documentation.
11. Plug the power cord into the wall outlet. Turn on the external devices and then turn on the system.
12. Restart the system according to the instructions in your system documentation.

Confirming Proper Installation

To confirm that the option is installed properly, perform the following steps:

1. Turn on the monitor and any other devices connected to the system unit.
2. Turn on the system unit.
3. Verify that the console display is available and legible on the monitor screen.

Troubleshooting

If the console display does not appear on the monitor screen, perform the following steps:

1. Verify that the power cords for the system and video monitor, and all related devices, are plugged into a live wall outlet and that all devices are on.
2. Ensure that the video and any optional cable connections are secure.
3. Verify that the video cable is properly secured to the video cable port (blue connector) on the PowerStorm 4D51T module and the video monitor.
4. Verify that both modules are installed in PCI slots on the same PCI bus (primary or secondary).
5. Verify that both modules are seated correctly in the PCI slots.
6. Verify that the monitor can handle the resolution and refresh rate. For Windows NT systems, refer to the *Graphics Support Services Software for Microsoft Windows NT Installation and User Guide for Intel Systems* for information.
7. Verify that there is no jumper on the VGA enable/disable pins on the PowerStorm 4D51T module as this would disable VGA on your module (see Figure 1-1).
8. Verify that the video monitor brightness and contrast controls are properly set.

If a problem persists, contact your DIGITAL service representative

A

Monitor Resolutions

The PowerStorm 4D51T GFX graphics option supports standard multi-sync monitors. Refer to your monitor user documentation for monitor resolution information. Additionally, your software user guide and release notes contain helpful information.

Table A-1 lists the software-supported monitor resolutions for the Windows NT operating system.

Table A-1 Monitor Resolutions for Windows NT Systems

Monitor Resolution	Aspect Ratio	Bits Per Pixel	Vertical Refresh Rates (Hz)
640 x 480	4 x 3	128	60, 72, 75, 85
800 x 600	4 x 3	128	60, 72, 75, 85
1024 x 768	4 x 3	128	60, 70, 75, 85
1152 x 864	4 x 3	128	60, 70, 75, 85
1280 x 960	4 x 3	100	60, 75
1280 x 1024	5 x 4	100	60, 75

B

Specifications

Physical Specifications

The physical specifications of the PowerStorm 4D51T GFX graphics option modules are listed in Table B-1.

Table B-1 Weight and Dimensions

Module	Weight	Length	Width	Height
4D51T	385 gm (13.6 oz)	329 mm (13.42 in.)	98.5 mm (3.88 in.)	18.4 mm (0.725 in.)
GFX	345 gm (12.2 oz)	329 mm (13.42 in.)	98.5 mm (3.88 in.)	18.4 mm (0.725 in.)

Environmental Specifications

The environmental specifications for the PowerStorm 4D51T GFX graphics option are listed in Table B-2.

Table B-2 PowerStorm 4D51T GFX Environmental Specifications

Temperature range	10°C to 40°C (50°F to 104°F)
Temperature change rate	11°C/hr (20°F/hr) maximum
Relative humidity	20% to 80% noncondensing
Maximum wet bulb temperature	33°C (92°F)
Minimum dew point	2°C (36°F)
Maximum altitude	3000 m (10,000 ft) at 36°C (96°F)

Specifications

Power Consumption

Power consumption for the 4D51T GFX graphics option modules is shown in Table B-3. Note that 3.3 V power is required in the PCI slot.

Table B-3 Power Consumption

Module	3.3V	5V	12V	-12V
PowerStorm 4D51T w/16 MB texture memory	20.8 W	7.5 W	.84 W	.36 W
GFX	0 W	25 W	0 W	0 W

Video Output/Input

Two output ports on the 4D51T module provide connection as follows:

- Blue connector is the video output to the monitor.
- Black connector is a pass through connector for VGA input from a separate VGA module.

Video Output Port

Table B-4 provides the pin connections for the video output port.

Table B-4 Video Output Pinout

Signal Name	Pin	Signal Name	Pin
Red Analog Video	1	Supply +5V	9
Green Analog Video	2	Ground	10
Blue Analog Video	3	Monitor ID [0]	11
Monitor ID [2]	4	Monitor ID [1] ¹	12
Ground	5	Horizontal Sync	13
Ground	6	Vertical Sync	14
Ground	7	Monitor ID [3] ²	15
Ground	8		

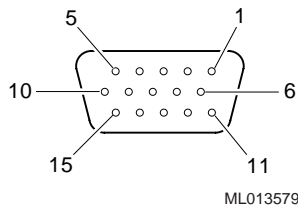
¹ Bi-directional Data (SDA) for DDC

² Data Clock (SCL) for DDC

Specifications

The video output connector is a female, 15-pin, D-sub connector illustrated in Figure B-1.

Figure B-1 Video Output Connector



VGA Input Port

The VGA input port allows connection of a separate VGA device for use by the system while in VGA mode.

Table B-5 provides the pin connections for the video (VGA) input port.

Table B-5 Video (VGA) Input Pinout

Signal Name	Pin	Signal Name	Pin
Red Analog Video	1	No Connection	9
Green Analog Video	2	Ground	10
Blue Analog Video	3	Monitor ID [0]	11
Monitor ID [2]	4	Monitor ID [1] ¹	12
Cable Sense	5	Horizontal Sync	13
Ground	6	Vertical Sync	14
Ground	7	Monitor ID [3] ²	15
Ground	8		

¹ Bi-directional Data (SDA) for DDC

² Data Clock (SCL) for DDC

Specifications

Stereo Sync Output

The stereo sync output port provides connection to the LCD shutter glasses' emitter module.

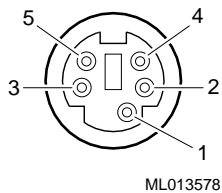
Table B-6 provides the pin connections for the stereo sync output port.

Table B-6 Stereo Sync Output Pinout

Signal Name	Pin	Signal Name	Pin
Ground	1	Stereo Sync	4
Ground	2	No Connect	5
+12V	3		

The stereo connector is a female, 5-pin, mini-DIN connector illustrated in Figure B-2.

Figure B-2 Stereo Output Connector



Cable Options

Table B-7 lists the cables that you can use with the PowerStorm 4D51T GFX graphics option.

Table B-7 Cable Options

Designation	DIGITAL Part Number	Length	Connector Type
BC13L—10	17--04340—01	3 meters (10 feet)	DSUB to 5-BNC
BC14J—10	17--04354—01	3 meters (10 feet)	DSUB to DSUB

C

For DIGITAL Service Use

FRU/Order Numbers

See Table C-1 to order field replaceable units (FRUs) for the customer.

Table C-1 Module FRUs

FRU	Order Number
PowerStorm 4D51T Module	30-46506-11
GFX Module	30-50093-01
16 MB Texture Memory (for PowerStorm 4D51T)	30-46506-13
Antistatic wriststrap	12-36175-01

