

# DIGITAL PowerStorm 4D30T Graphics Option

---

## Installation Guide

Part Number: EK-PBXGD-IN. A01

**July 1997**

This guide describes the installation of the DIGITAL PowerStorm 4D30T Graphics Option on DIGITAL personal workstation products.

**Digital Equipment Corporation  
Maynard, Massachusetts**

---

**July 1997**

Digital Equipment Corporation makes no representations that the use of its products in the manner described in this publication will not infringe on existing or future patent rights, nor do the descriptions contained in this publication imply the granting of licenses to make, use, or sell equipment or software in accordance with the description.

Possession, use, or copying of the software described in this publication is authorized only pursuant to a valid written license from DIGITAL or an authorized sublicensor.

**FCC NOTICE:** This equipment generates and uses radio frequency energy. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart G of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio and television interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, the user is encouraged to try to correct the interference.

© Digital Equipment Corporation 1997. All rights reserved.

The following are trademarks of Digital Equipment Corporation: DIGITAL, DIGITAL Open3D, PowerStorm, and the DIGITAL logo.

The following are third-party trademarks:

Microsoft is a registered trademark and Windows NT is a trademark of Microsoft Corporation.

OpenGL is a registered trademark of Silicon Graphics, Inc.

UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Ltd.

CRYSTAL EYES is a registered trademark of Quality Accessories, Inc.

NUVISION is a registered trademark of Nuvision, Inc.

All other trademarks and registered trademarks are the property of their respective holders.

---

# Table of Contents

## 1 Overview

1.1 Introduction .....	1-1
1.2 Module Description.....	1-1
1.3 Connector Pinouts .....	1-4
1.4 Specifications.....	1-5

## 2 Installation

2.1 Introduction .....	2-1
2.2 Unpacking.....	2-1
2.3 Installation Procedure (Windows NT 4.0) .....	2-1
2.3.1 New Installation or Upgrade of Windows NT .....	2-2
2.3.2 Upgrade of Graphics Support Services Software Drivers .....	2-2
2.3.3 Changing Windows NT Display Characteristics .....	2-4
2.4 Hardware Installation.....	2-4
2.5 Upgrading Texture Memory .....	2-6
2.5.1 Performing the Upgrade .....	2-6
2.5.2 Verifying the Upgrade.....	2-7

## Figures

Figure 1-1 PowerStorm 4D30T Graphics Option.....	1-3
Figure 2-1 Upgrading the Texture Memory DIMM .....	2-7

## Tables

Table 1-1 PowerStorm 4D30T Graphics Options .....	1-1
---	-----

Table 1-2 Supported Systems and Support Matrix..... 1–2

Table 1-3 Standard 15-Pin VGA Connector Pinout ..... 1–4

Table 1-4 5-Pin mini-DIN Stereo (3D) Video Connector Pinout ..... 1–4

Table 1-5 PowerStorm 4D30T Graphics Option Specifications..... 1–5

---

# Preface

## Purpose of This Guide

This guide describes how to install the DIGITAL PowerStorm 4D30T Graphics Option in your computer system.

## Who Should Use This Guide

This guide is intended for anyone who has purchased the DIGITAL PowerStorm 4D30T Graphics Option, either already installed or as an add-on.

## Structure of This Guide

This guide is organized as follows:

- **Chapter 1, Overview**-Provides an overview of the DIGITAL PowerStorm 4D30T Graphics Option.
- **Chapter 2, Installation**-Describes how to install the DIGITAL PowerStorm 4D30T Graphics Option in your DIGITAL personal workstation running Windows NT and how to upgrade the CDRAM textured memory DIMM.

## Related Documentation

- *Graphics Support Services Software Version 4.3 for Microsoft Windows NT Installation and User Guide for Alpha Systems (AA-Q7ARK-TE)*
- *Graphics Support Services Software Version 4.3 for Microsoft Windows NT Installation and User Guide for Intel Systems (AA-R2KPE-TE)*

### Conventions Used in This Guide

In this guide, every use of Windows NT means the Windows NT operating system.

This guide also uses the following conventions:

Convention	Meaning
<b>Note</b>	A note calls the reader’s attention to any item of information that may be of special importance.
<b>Caution</b>	A caution contains information essential to avoid damage to the equipment.
<i>italic type</i>	<i>Italic type</i> indicates complete titles of manuals.
<b>bold type</b>	<b>Bold type</b> indicates text that is highlighted for emphasis.
Monospaced	In text, this typeface indicates the exact name of a command, routine, partition, pathname, directory, or file.

### Reader’s Comments

DIGITAL welcomes your comments on this or any other manual. You can send your comments to DIGITAL by mail to the following address:

Digital Equipment Corporation  
Shared Engineering Services  
PKO3-2/29K  
129 Parker Street  
Maynard, MA 01754-2199

---

# Overview

## 1.1 Introduction

This chapter provides a brief overview of the PowerStorm 4D30T Graphics Option.

## 1.2 Module Description

The PowerStorm 4D30T Graphics Option accelerator module is a single expansion-slot, 32-bit PCI bus graphics option that provides 2D and 3D graphics acceleration for Alpha workstations and Intel systems running Windows NT.

The PowerStorm 4D30T graphics option is available with 4 MB or 16 MB of CDRAM texture memory on a DIMM. An optional 16 MB texture memory on a DIMM is available for upgrading the 4 MB graphics option to 16 MB of CDRAM texture memory. These options are listed in Table 1-1.

**Table 1-1 PowerStorm 4D30T Graphics Options**

Option	Description
PBXGD-AA	PowerStorm 4D30T graphics module with 4 MB of CDRAM texture memory on a DIMM.
PBXGD-AB	PowerStorm 4D30T graphics module with 16 MB of CDRAM texture memory on a DIMM.
PBXGD-GB	16 MB of CDRAM texture memory on a DIMM for upgrading a 4 MB version to a 16 MB version.

Overview

Table 1-2 provides a support matrix for the PBXGD PowerStorm 4D30T graphics option.

Table 1-2 Supported Systems and Support Matrix

System	Service Pack	Minimum BIOS	O/S Version
DPWS 433a	SR1	V5.31	Windows NT 4.0
500a	SR1	V5.31	Windows NT 4.0
600a	SR1	V5.31	Windows NT 4.0
DPWS 266i	SR1	V4.05	Windows NT 4.0
266i <sup>2</sup>	SP2	V4.05	Windows NT 4.0

The PowerStorm 4D30T graphics option (see Figure 1-1) contains two connectors on the PCI bulkhead. One is a standard 15-pin VGA connector and the other is a 5-pin mini-DIN connector used for stereo viewing with CRYSTAL EYES or NUVISION stereo goggles.

**Note**

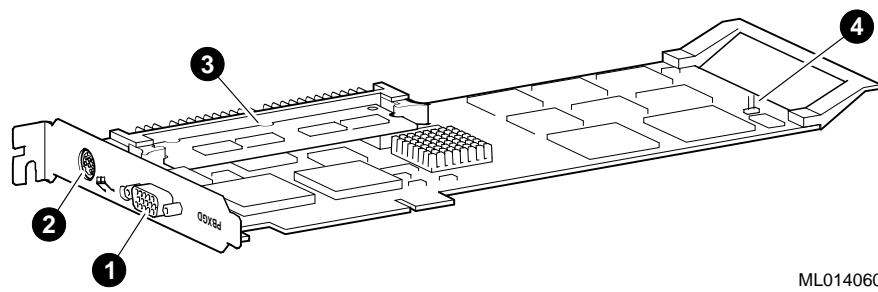
Stereo viewing will be supported on future releases of the software.

The option module contains one 2-pin jumper for enabling or disabling (jumper installed) the VGA capability when more than one VGA graphics module is installed in the same system. The option module also can contain either a 4 MB or 16 MB CDRAM texture memory on a DIMM.



## Overview

**Figure 1-1 PowerStorm 4D30T Graphics Option**



ML014060

- |  |   |
|--|---|
| ❶ Standard 15-pin VGA connector              | ❸ 4 MB or 16 MB CDRAM texture memory on a DIMM            |
| ❷ 5-pin mini-DIN stereo (3D) video connector | ❹ VGA enable/disable jumper (jumper installed = disabled) |

1.3 Connector Pinouts

Table 1-3 contains a listing of the pins and signals found on the standard 15-pin VGA connector.

Table 1-3 Standard 15-Pin VGA Connector Pinout

Pin No.	Signal
1	RED VIDEO
2	GREEN VIDEO or COMPOSITE SYNC with GREEN VIDEO
3	BLUE VIDEO
4	NC (no connection)
5	GROUND
6	NC (no connection)
7	GROUND
8	GROUND
9	NC (no connection)
10	GROUND
11	NC (no connection)
12	SERIAL DATA
13	HORIZONTAL SYNC or COMPOSITE SYNC
14	VERTICAL SYNC (VCLK)
15	SERIAL CLOCK

Table 1-4 contains a listing of the pins and signals found on the 5-pin stereo (3D) video connector.

Table 1-4 5-Pin mini-DIN Stereo (3D) Video Connector Pinout

Pin No.	Signal
1	STEREO_RETRN
2	STEREO_RETRN
3	+12 Vdc
4	STEREO_OUT
5	GROUND

1.4 Specifications

Table 1-5 lists the specifications for the PowerStorm 4D30T graphics option.

Table 1-5 PowerStorm 4D30T Graphics Option Specifications

Stereo	Stereo viewing will be supported with CRYSTAL EYES or NUVISION stereo goggles on future software releases
Resolution	1280 x 1024 (maximum) @ 75 Hz
Color planes	24 bit double buffered
Overlay	8 bit, shared with Alpha planes 4 bit, shared with stencil
Stencil planes	4 bit, shared with overlay
Z-buffer	24 bit
Total bits/pixel	96
Frame buffer	15 MB
Texture memory	4 MB or 16 MB
Window ID	4
Alpha planes	8 bit, shared with 8 bit overlay
Form factor	Single full-length PCI card
PCI	PCI 2.1, 32-bit, 33 MHz, 5V signaling
Input voltage	3.3 Vdc, 5 Vdc, +12 Vdc
Power	25 W maximum
Operating temperature	10°C to 40°C (50°F to 104°F)
Relative humidity	10% to 90% noncondensing



---

## Installation

### 2.1 Introduction

This chapter describes the installation of the PowerStorm 4D30T Graphics Option in a DIGITAL personal workstation system. Topics included in this chapter are:

- Unpacking
- Windows NT 4.0 installation
- Hardware installation
- Upgrading texture memory

### 2.2 Unpacking

The graphics option hardware is packaged in a single carton that contains the graphics option and an installation guide.

### 2.3 Installation Procedure (Windows NT 4.0)

---

**Note**

---

If a graphics option other than the PowerStorm 4D30T was previously operating in the system, keep that option installed and refer to Section 2.3.2. If the previously installed graphics option is not available or it is not operational, refer to Section 2.3.1.

---

## Installation

### 2.3.1 New Installation or Upgrade of Windows NT

Before installing Graphics Support Services Software during a Windows NT upgrade or new installation, install the PowerStorm 4D30T graphics option as described in Section 2.4. You can then install Windows NT as described in the Windows NT documentation.

During Windows NT installation, a hardware and software component list is displayed, like the one shown here:

Computer: DIGITAL Personal Workstation xxx (xxx = CPU type)

Display: VGA Compatible

Keyboard: XT, AT, or Enhanced Keyboard (83-104 keys)

Keyboard Layout: US

Pointing Device: Mouse Port Mouse

No Changes: The above list matches my computer

When you have completed the Windows NT installation, go to Section 2.3.2.

### 2.3.2 Upgrade of Graphics Support Services Software Drivers

If you have purchased the PowerStorm 4D30T graphics option as an add-on, you must install the Graphics Support Services Software drivers. Install the 2D and 3D drivers (the DIGITAL optimized OpenGL support) from the Graphics Support Services Software package CD-ROM by performing the following steps:

1. Boot your system and log into Windows NT if you have not already done so.
2. From the desktop, choose **My Computer**.
3. From My Computer, choose **Control Panel**.
4. From Control Panel, choose **Display**.
5. From the Display Properties dialog box, choose the **Settings** tab.
6. From the Settings dialog box, choose the **Display Type** button to see the driver and adapter (board) information.
7. From the Display Type dialog box, choose **Change**.
8. From the Change Display dialog box, choose **Have Disk**.
9. In the Install from Disk dialog box, you are prompted to insert the manufacturer's installation disk into the selected drive. Insert the Graphics Support Services Software package CD-ROM into the CD-ROM drive unit.

## Installation

10. Enter the path of the PowerStorm 4D30T driver and choose **OK**.

The path is of the following format, where `dev:\` is the drive name (for example, `E:\` for the E drive):

`dev:\i386\pbxgd\nt40` (Intel systems)

**or**

`dev:\alpha\pbxgd\nt40` (Alpha workstations)

11. In the Change Display dialog box, the driver whose path you just defined is displayed. Confirm this choice by choosing **OK**.

The driver name displayed is:

Digital PowerStorm 4D30T (PBXGD)

12. When the message displays stating that this is a third party driver, confirm by choosing **Yes**.

A status box displays reflecting the progress of the driver installation.

13. When the files have been copied to your hard disk, a dialog box indicating that the driver was successfully installed is displayed. Choose **OK** and remove the CD-ROM from the drive.
14. Choose **Close** to close the Display Type dialog box.
15. Choose **Close** to close the Display application.
16. When a message displays stating that you must restart your computer to use the new display driver, choose **No**.
17. Shut down your system by choosing **Shut Down** from the Start menu, then remove power from your computer system and install the PowerStorm 4D30T graphics option as described in Section 2.4 if you haven't already done so.
18. After installing the PowerStorm 4D30T graphics option. Reboot your system to access the new display driver. After your system reboots, a message displays indicating that the default screen resolution and refresh rate are being used. For information on changing these values, refer to Section 2.3.3.

2.3.3 Changing Windows NT Display Characteristics

After installing the PowerStorm 4D30T graphics option, you can change the screen resolution and refresh rate, collectively referred to as the *display mode*. Before changing the display mode, you should verify that your monitor can accept the new values (refer to the monitor documentation). To change the display resolution and refresh rate, perform the following steps:

- 1. From the desktop, choose **My Computer**.
- 2. From My Computer, choose **Control Panel**.
- 3. From Control Panel, choose **Display**.
- 4. From the Display Properties dialog box, choose the **Settings** tab.
- 5. From the Settings dialog box, click on the arrows in the **Desktop Area** to change the screen resolution.

To change the refresh rate, choose one of the options in **Refresh Frequency**. (You can also change the resolution and refresh rate by choosing **List All Modes** and the desired mode, and then choosing **OK**.) If the refresh rate selected is not supported by the resolution you chose, the resolution will automatically change to the nearest value supported by that refresh rate, or the refresh rate will change to support the resolution.

- 6. Choose **Test** to verify that the settings work correctly. A test pattern will be displayed on your monitor for about five seconds.
- 7. You will now see the question “Did you see the test bitmap properly?”. If you are satisfied with the video display, choose **Yes**.  
  
Choose **OK** to accept the changed settings.
- 8. You may have to adjust your monitor to align the new resolution to the monitor. This is typically done by using the controls on the front or side of the monitor.

2.4 Hardware Installation

The following section describes how to install the PowerStorm 4D30T Graphics Option. To install the graphics option, perform the following steps:

Note

Before installing the graphics option, check your monitor specification for signal compatibility and supported features offered by the graphics option.



## Installation

---

### Caution

---

Static electricity can damage sensitive electronic components. When handling your graphics option, use an antistatic wriststrap that is connected to a grounded surface on your computer system.

---

1. Perform a normal power down of your computer system and disconnect the monitor cable.
2. Remove the cover from your computer (refer to your system documentation).
3. Put on an antistatic wriststrap.

---

### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

---

4. If your computer has an existing graphics module, remove the screw that secures it and then remove the module.
5. If your system had a previously installed graphics option, you can use that slot if it is a PCI bus, or you can select any empty PCI expansion slot. Remove the slot cover if you are using a new slot. Refer to your system owner's guide for information about graphics option slots.
6. Grasp the top edge of the graphics option and carefully insert it into the slot, then firmly seat it.
7. Secure the module retaining bracket.
8. Replace the computer cover.
9. Ensure that the monitor cable is connected to the video output connector located on the back of the graphics option.
10. Perform a normal power up of your computer system.

## 2.5 Upgrading Texture Memory

The following sections describes how to upgrade the texture memory DIMM on the PowerStorm 4D30T graphics option and how to verify the upgrade.

### 2.5.1 Performing the Upgrade

A PowerStorm 4D30T graphics option with a 4 MB texture memory DIMM can be upgraded to a 16 MB texture memory DIMM. To upgrade the texture memory DIMM, perform the following steps:

Caution

Static electricity can damage sensitive electronic components. When handling your graphics option, use an antistatic wriststrap that is connected to a grounded surface on your computer system.

1. Remove power from your computer system and disconnect the monitor cable.
2. Remove the cover from your computer (refer to your system documentation).
3. Put on an antistatic wriststrap.

Caution

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

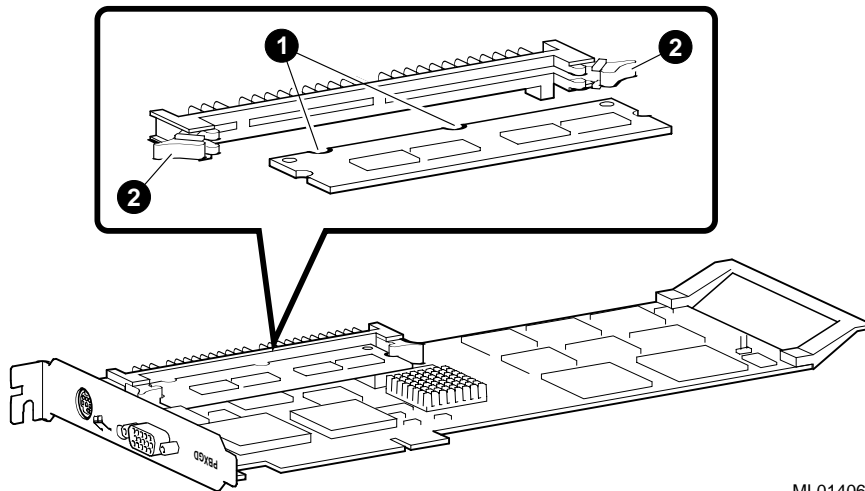
4. Remove the screw that secures the PowerStorm 4D30T graphics option and then remove the module.
5. Pull out on the locking levers ❷ that secure the existing DIMM in its connector (see Figure 2-1). This ejects the DIMM from its connector.
6. Align the replacement DIMM with the guide slots, ensuring that the notches ❶ on the DIMM match the connector, and push it in firmly until it is seated in the connector and the locking levers ❷ have locked into place (see Figure 2-1).
7. Grasp the top edge of the PowerStorm 4D30T graphics option and carefully insert it back into the PCI slot it was removed from, then firmly seat it.
8. Secure the module retaining bracket.
9. Replace the computer cover.

## Installation

10. Ensure that the monitor cable is connected to the video output connector located on the back of the graphics option.
11. Perform a normal power up of your computer system.

After performing the upgrade, refer to Section 2.5.2 to verify that the upgrade has been performed properly.

**Figure 2-1 Upgrading the Texture Memory DIMM**



ML014061

### 2.5.2 Verifying the Upgrade

After performing the upgrade, perform the following procedure to verify that the upgrade has been performed properly.

1. Boot your system and log into Windows NT if you have not already done so.
2. From the desktop, choose **My Computer**.
3. From My Computer, choose **Control Panel**.
4. From Control Panel, choose **Display**.
5. From the Display Properties dialog box, choose the **REALimage (tm) Settings** tab. This display contains various information including the size of the Frame Buffer memory and the Texture memory in the upper right portion of the display. Ensure that the display shows 16 Meg for Texture memory.