Dell Precision™ T5500/T7500 Tower Workstations Technical Guide

Dell Precision T7500 and T5500

Dell Precision™ Workstations

Dell Precision workstations have been the world's leading workstation brand for the last nine years[1] and continue to deliver value to customers by combining relevant new technologies and focusing on the core values of the product family. These are:

- **Performance**
  Providing relevant technologies design to drive applications as fast as possible
- **Application Focus**
  Working closely with the key software partners to ensure reliability and performance through certification and excellent support.
- **Scalability**
  Designing systems that can scale with your application needs and company's needs.
- **Managed for Business**
  Building our solutions around industry standards and helping simplify your IT
- **Optimized solutions**
  Recognizing the wide range of application areas for workstations and offering the flexibility in our systems to help optimize them to suit our customers' requirements

Dell partners with strategic Independent Software Vendors (ISVs) to certify system and application compatibility so that applications can run gracefully on Dell Precision workstations. Through rigorous testing, Dell also targets excellent compatibility and optimized performance in demanding work environments such as Computer Aided Design (CAD), engineering, and architecture, making the Dell Precision range a perfect platform for demanding workstation users.

Dell Precision Tower Workstations

Dell Precision offers a broad range of tower workstations as part of the overall family. Such a broad range helps provide a wide choice ranging from ISV certified mainstream systems to highly scalable flagship systems for the most demanding applications. The highly configurable chassis options, including the T7500 that can be configured in over a billion different ways, provide a platform, trusted by many, to run key applications gracefully.

These new tower workstations are built around the latest Intel® Xeon® architecture and offer benefits of the Intel Nehalem technology including support for ECC memory and Direct Cache Access (DCA), neither of which are typically found in standard business desktop systems. ECC memory and DCA are not available with Intel® Core™ i7 processors and was a significant factor in the choice of technologies for the latest range of tower workstations. The new architecture results in low latency between memory and processor and helps provide excellent overall workstation-class application performance and stability.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

The Dell Precision T7500 Workstation

The Dell Precision T7500 workstation, a powerhouse of productivity, unites lightning-fast 64-bit multi-core Intel® Xeon® processors, outstanding graphics technology, and exceptional memory capacity in an innovative chassis to deliver superb performance, flexibility, scalability, and reliability. Designed to deliver groundbreaking performance, blistering speed, and scalability for compute and graphics-intensive environments, the Dell Precision T7500 helps you power through the most complex tasks and complete projects quickly with up to 50% more system memory than its groundbreaking predecessor.

The Dell Precision T5500 Workstation

The Dell Precision T5500 Workstation is a productivity machine with lightning-fast 64-bit multi-core Intel® Xeon® processors, impressive graphics, and exceptional memory capacity, all workingtogether in a flexible and innovative compact chassis that can deliver up to 90% better multi-threaded DCC application performance than Dell's previous generation[2].
Designed for performance, reliability, and scalability in environments where space is at a premium, the Dell Precision T5500 powers through complex tasks quietly and efficiently.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Performance Architecture

The Dell Precision T7500 features the Intel® X5520 chipset, powerful 45nm Intel Xeon® Quad-Core Processors, each up to 8MB Level 3 cache, and up to 192GB[3] of DDR3 ECC system memory (three channels per processor)[4].

The Dell Precision T5500 features the Intel® X5520 chipset, powerful 45nm Intel Xeon® Quad-Core Processors, each up to 8MB Level 3 cache, and up to 72GB[5] of DDR3 ECC system memory (three channels per processor)[4].

A description of the latest version of Intel Xeon architecture, and its benefit for workstation users, is given later in this document.

Workstation Graphics

Bring your graphics to the next level with our intelligent selection of ISV-certified, workstation-class graphics cards. Our ultra-high-end graphics solutions deliver outstanding visualization capabilities for whatever application you are running. Enhanced graphics are required whether you work in computer-aided design, architecture, engineering, or digital content creation. Dell Precision workstations provide superb OpenGL® 3D performance or dependable and affordable 2D performance to help make you successful in your designs, animation modelling, software development, or for any other purpose you use your workstation.

Dell works with ATI (AMD) and NVIDIA to source a comprehensive selection of professional graphics cards to deliver appropriate graphics solutions for workstation markets. Through advanced multi-monitor support, the T5500/T7500 graphics options enable workstation users who want additional real-estate to connect up to four displays and get a range of multi-monitor functionality that can help make them more productive.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Users of Workstations

The **Dell Precision™ T7500** tower workstation is our flagship fixed workstation solution designed to run the most demanding applications for users who require a workstation to deliver performance, scalability and configuration flexibility. Typical customers will want a system that has excellent memory scalability, high-performance OpenGL graphics, multiple hard drive support and advanced processing power.

The Dell Precision T7500 is designed to be primarily used by animators, industrial designers, CAD designers or engineers who require high performance OpenGL graphics and need to manipulate extremely large data sets. They also need the additional memory scalability over and above that offered by the T5500. This workstation is designed for professionals who analyze highly complex mechanical designs or visualize seismic information, or who require intense graphics used to create special effects and 3D models.

The **Dell Precision™ T5500** tower workstation is our mainstream fixed workstation solution for demanding application users who require full dual-socket performance in a workstation with a small footprint. Typical customers will want a system that has high-performance OpenGL graphics plus excellent processing power. Workstation customers often choose performance over other attributes, but the compact chassis is an added bonus.

The T5500 is also the recommended follow on system for customers who currently use the T5400 workstation. Ideally suited for use on financial trading floors due to its compact size, the T5500 delivers up to 8 processing cores (16 logical cores with HyperThreading enabled) for exemplary multi-tasking performance.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Dell Precision T7500 Key Features

The T7500 offers new Intel core architecture and technologies integrated in a proven chassis specifically designed to house flagship workstation performance.

The new chipset helps enable users to benefit from memory scalability previously unheard of in any Dell Precision workstation. With up to 12 DIMM slots (6 per processor) to expand memory capacity up to 192GB[3] and a chassis designed for flexible configuration option, the Dell Precision T7500 provides a highly scalable architecture that enables you to manage massive data sets with outstanding performance and reliability.

Offering support for memory speeds of up to 1066MHz or 1333MHz3, the T7500 is the flagship tower workstation that helps make Dell Precision workstations stand out from the crowd. Note that 128GB[3] and 192GB[3] memory configurations based upon 16GB[6] quad rank DIMMs in the Intel Nehalem architecture will operate at 800MHz.

The T7500 is designed from the ground up to be highly scalable. It has two native Gen 2 PCIe x16 graphics slots each capable of driving graphics cards up to 225W (plus 3 additional x16 slots - 2 wired as x8, 1 wired as x4) plus 2 legacy slots PCI and PCI-X, four dedicated hard drive bays in addition to the three optical drive bays ensuring full optional support for up to 7.5TB[7] of local storage with or without RAID.

Such scalability is likely to be adopted by specialists in animation and special effects, oil and gas, and high-end analysis work, although it is highly suitable for other high-end workstation applications in CAD.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Dell Precision T5500 Key Features

The T5500 offers new Intel core architecture and technologies integrated in a proven chassis specifically designed to house compact dual-socket workstation performance.

The new chipset helps enable users to benefit from memory scalability previously unheard of in such a compact Dell Precision workstation. With up to 9 DIMM slots to expand memory capacity up to 72GB[5] and a chassis designed for constrained spaces, the Dell Precision T5500 provides a highly scalable architecture that enables you to manage large data sets with outstanding performance and reliability. Offering support for memory speeds of up to 1066MHz or 1333MHz, the T5500 is Dell's mainstream dual-socket workstation.

The T5500 also has two native Gen 2 PCIe x16 graphics slots each capable of driving graphics cards up to 150W (plus 2 x16 slots wired as x8, and 2 legacy slots PCI and PCI-X, two dedicated hard drive bays and up to two optical drive bays ensuring full optional support for up to 4.5TB[7] of local storage with or without RAID.

Such compact performance is likely to be adopted by specialists in finance industry for trading floor needs, although it is highly suitable for other high-end workstation applications in CAD and similar needs for performance architecture.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Dell Precision Tower System Core Architecture

The new Dell Precision workstations incorporate a significant new core technology from Intel called Nehalem which is branded as Intel Xeon in Dell Precision tower workstations. This new technology will provide excellent levels of performance for workstation users. This section describes how the new architecture works and some of the key differences to previous generations of Intel architecture.

Chipset

Intel® X5520 Chipset

Key features:

- Support for 1066 & 1333MHz DDR3 memory[3]
- Support for up to 192GB[3] system memory (T7500) and for tri-memory channels
- Turbo Boost – designed to dynamically increase the speed of some cores on demand when others are inactive, enabling high performance
- Direct Cache Access (DCA) – when cores are inactive, the cache of those cores can be accessed by those that are active
- Memory controller integrated into CPU resulting in low latency and excellent application performance

Dell Precision Tower System Architecture Overview

This new 45nm architecture provides the next step in processor and chipset design and performance from Intel.

The Front Side Bus (FSB) has been removed and each processor now has its own integrated memory controller. There are new high speed point-to-point links to facilitate data transfer between the processor and parts of the system that control the I/O and graphics. This new high speed technology is called the Intel Quick Path Interconnect (QPI).

DDR2 memory has been replaced by fast and efficient DDR3. As dedicated memory communicates directly with each processor rather than going through a central memory controller then data fed to the processor has very low latency helping performance to be enhanced.

This architecture is so advanced that it can monitor and control each individual processor core which can help improve performance for single threaded and multi-threaded applications alike.

Let's take a closer look and understand how this can impact performance for workstation applications.

Intel Xeon Processors and DDR3 Memory

The integrated memory controller on new Intel Xeon processors will have three memory channels enabling the processor to talk to three DDR3 memory modules in parallel without having to go through a central memory controller hub. Fast memory and tight integration with the processor delivers excellent performance.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

For dual socket workstations, an optional second processor brings the addition of three further channels of memory, increasing overall bandwidth (as there are now six channels) and memory scalability.

Processors can also access cache memory differently to previous generations of Intel Xeon processors. Each processor has its own cache memory (L2 cache) just like before but now the shared cache (L3 cache) can be accessed by all cores of a processor whereas older generations saw shared cache limited to pairs of cores within a processor. Intel's new Direct Cache Access enables active cores to use cache of inactive cores, increasing availability of the total amount of cache memory to the processing resources.

Intel Nehalem processors now have a power control unit inside the CPU providing a means to better manage power. On previous processors each core had to run at the same clock speed but Nehalem processor can be managed individually by the system and run at different speeds to save power or boost performance using Intel's new Turbo mode.

With the launch of Nehalem, Intel is bringing back a new and revised HyperThreading solution enabling a quad-core processor to have eight logical cores.

Benefits for Dell Precision workstation users

Fast DDR3 memory and tightintegration of memory and processor means that CPU intensive workstation applications can benefit from a highly efficient architecture.

Adding an optional second processor is expected to improve performance of multi-threaded applications like Adobe Photoshop and can improve the ability of the system to move large amounts of data to the processors due to increased memory bandwidth.

The new cache memory architecture and the ability to share this cache memory across processor cores will benefit demanding workstation applications by providing a solution that will help reduce the number of times the system needs to address the main memory during heavy compute cycles as more information can be temporarily stored closer to the processor(s)

Managing processor cores individually means that single-threaded applications running on multi-core processors can do so efficiently when other cores are not used to their maximum potential. The system can shut the inactive cores down, or if the system is well inside its thermal envelope, the active core(s) can have their clock speeds increased temporarily to boost performance, limited only by overall processor temperature and power consumption which is monitored by the system. This is Intel's Turbo Boost mode for Nehalem processors. As the Dell Precision workstations have excellent thermal designs and our heat-sinks for the processors are highly advanced and efficient it is expected that Dell Precision systems will be able to provide Turbo Boost mode for extended periods of time, which can help boost performance for a wide variety of workstation applications. As many applications (even workstation applications) are still single threaded, Intel Nehalem offers an architecture that can benefit these and multi-threaded alike. For those applications that benefit from HyperThreading the return of this feature will see performance improvements

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Graphics

The Dell Precision T5500/T7500 offer a range of graphics cards from entry 2D to high performance OpenGL 3D with up to 4GB[4] of graphics memory.

NVIDIA Quadro® FX series ultra high performance graphics help enable workstation application users to enjoy excellent productivity. In addition, many workstation users can potentially transition from a desktop platform to a mobile platform, gaining the benefit of mobility without compromising performance.

The NVIDIA Quadro FX series PCI Express graphics solution offers hardware support, also called hardware acceleration, for a host of OpenGL 2.1 and DirectX® 10 functions including anti-aliased lines, two-sided lighting, overlay planes and window clipping. The NVIDIA Quadro FX series offers a unified architecture designed to dynamically allocate compute, geometry, shading and pixel processing power to deliver optimized GPU performance. The NVIDIA Quadro FX series also uses a reference standard for Shader Model 4.0 enabling a high level of performance and ultra-realistic effects for OpenGL and next generation DirectX 10 leading edge professional applications. These functions help enable users to be highly efficient and productive.

Ideal for Computer Aided Design (CAD), Digital Content Creation (DCC) and simulation markets, ATI™ FirePro™ 3D workstation graphics accelerators deliver exceptional features and price performance. ATI FirePro 3D graphics provide the capability to store geometry inside the card without having it pushed back to the CPU to calculate changes. This can help increase performance of rotations with larger-scale models. Additionally, ATI FirePro 3D graphics products incorporate unique AutoDetect technology. As users open 3D applications or move between them, optimized ATI FirePro 3D graphics driver settings are automatically configured to help maximize performance under a multitude of workflow demands.

The ATI FirePro V8700 workstations graphics accelerator from ATI is a high-end workstation solution with 1GB frame buffer memory[4] that comes with an extremely high number of shader engines (800) and GDDR5 memory technology. The V8700 is available as an option on the T7500, T5500 and T3500 workstations and is ideally suited for users who work with large models and shader-intensive applications offering a large frame buffer for complex and large data sets offering accurate color reproduction and superior visual quality.
Other ATI FirePro cards available as an option on all three new tower workstations include the V5700 and the V3750.

T5500/T7500 offerings include:

NVIDIA Quadro FX 5800	NVIDIA NVS 295
NVIDIA Quadro FX 4800	NVIDIA NVS 420 Quad monitor graphics
NVIDIA Quadro FX 3800	ATI FirePro V8700
NVIDIA Quadro FX 1800	ATI FirePro V5700
NVIDIA Quadro FX 580	ATI FirePro V3750

All graphics cards support dual-monitor configurations

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Power Efficiency & Productivity in Proven Reliable Designs

Through intuitive design and performance-driven technology, the new Dell Precision workstations are designed to deliver outstanding capabilities in the most efficient design possible. In addition, we pack every system with business-relevant features built on direct feedback from customers just like you. The result? High productivity and outstanding effectiveness, across the board.

Connectivity

The Dell Precision T5500/T7500 features an integrated Broadcom® 5754 Gigabit Ethernet controller that supports Wake-on-LAN from all power states (Off, Hibernate, and Standby) allowing remote systems management

The RJ-45 port is located on the back of the system

Expandability

PCI/PCIe/PCI-X Card Expansion

The T5500 has 2 native Gen 2 PCIe x16 graphics slots each capable of driving graphics cards up to 150W (plus 2 x16 slots wired as x8, and 2 legacy slots PCI and PCI-X.

The T7500 also 2 native Gen 2 PCIe x16 graphics slots each capable of driving graphics cards up to 225W (plus 3 additional x16 slots - 2 wired as x8, 1 wired as x4) plus 2 legacy slots PCI and PCI-X.

All PCI-e slots are Gen 2.

Removable Media Drives

The Dell PrecisionT5500 and T7500 systems offer multiple optical bays that can house an optional CD-RW/DVD Combo, DVD-ROM, or DVD+/-RW drive.

Hard Disk Drives

The Dell Precision T5500 and T7500 systems offer a range of SATA hard drives up to 1.5TB[7] at 7,200 RPM and up to 300GB[7] at 10,000 RPM. SAS 15K drives are available up to 450GB[7]. Hardware and host based RAID options can deliver increased I/O performance or enhanced reliability.

Memory

1066MHz and 1333MHz ECC DDR3 and ECC DDR3 registered memory. Memory scales up to 192GB[3] on the T7500 with 2 processors (maximum 12 DIMM slots)
Note:16GB quad ranked DIMMs operate at 800MHz

The T5500 delivers up to 72GB[5] with 2 processors (maximum 9 DIMM slots)
Note: 16GB quad ranked DIMMs in 72GB[5] configuration operate at 800MHz.

Operating System Support

All Dell Precision Workstations including the T5500 and T7500 systems offer the choice of Microsoft® Windows Vista® and Windows® XP (Via Microsoft® Windows Vista® downgrade

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

program) 32-bit or 64-bit version operating systems. Red Hat® Enterprise Linux® Version 5.3 is another factory installed option (support provided for Version 4.7 as well).

Dell Precision Factory Installed OS Choices:

- Windows® XP Pro 32 & 64bit, SP3 (via Windows Vista® downgrade program)
- Windows Vista® Ultimate-32 & 64bit, SP1
- Windows Vista® Business-32 & 64bit, SP1
- Red Hat® Enterprise Linux® V5.3 64Bit (V4.7 supported)

Benefits of 64-bit OS:

- 64-bit native applications can deliver more data more quickly, so memory-intensive applications can run more quickly and efficiently.
- Data in memory can be accessed thousands of times faster than it is on a disk drive. Applications can preload substantially more data into virtual memory, allowing rapid access by the 64-bit processor.
- Ability to address 4GB[4] or more of physical system memory.
- Freedom to maximize your resources by hosting your 32-bit applications and scalable, high performing 64-bit applications on the same platform.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

EnergyStar

What is Energy Star?

Energy Star 5.0 is a configurable option on the new Dell Precision T3500 workstation.

ENERGY STAR® qualified products and practices can help you save money and can reduce greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy. You can help reduce electricity usage and its environmental impact by power managing or turning off your product when it is not in use for extended periods of time, particularly at night and on weekends.

85% Efficient Power Supply

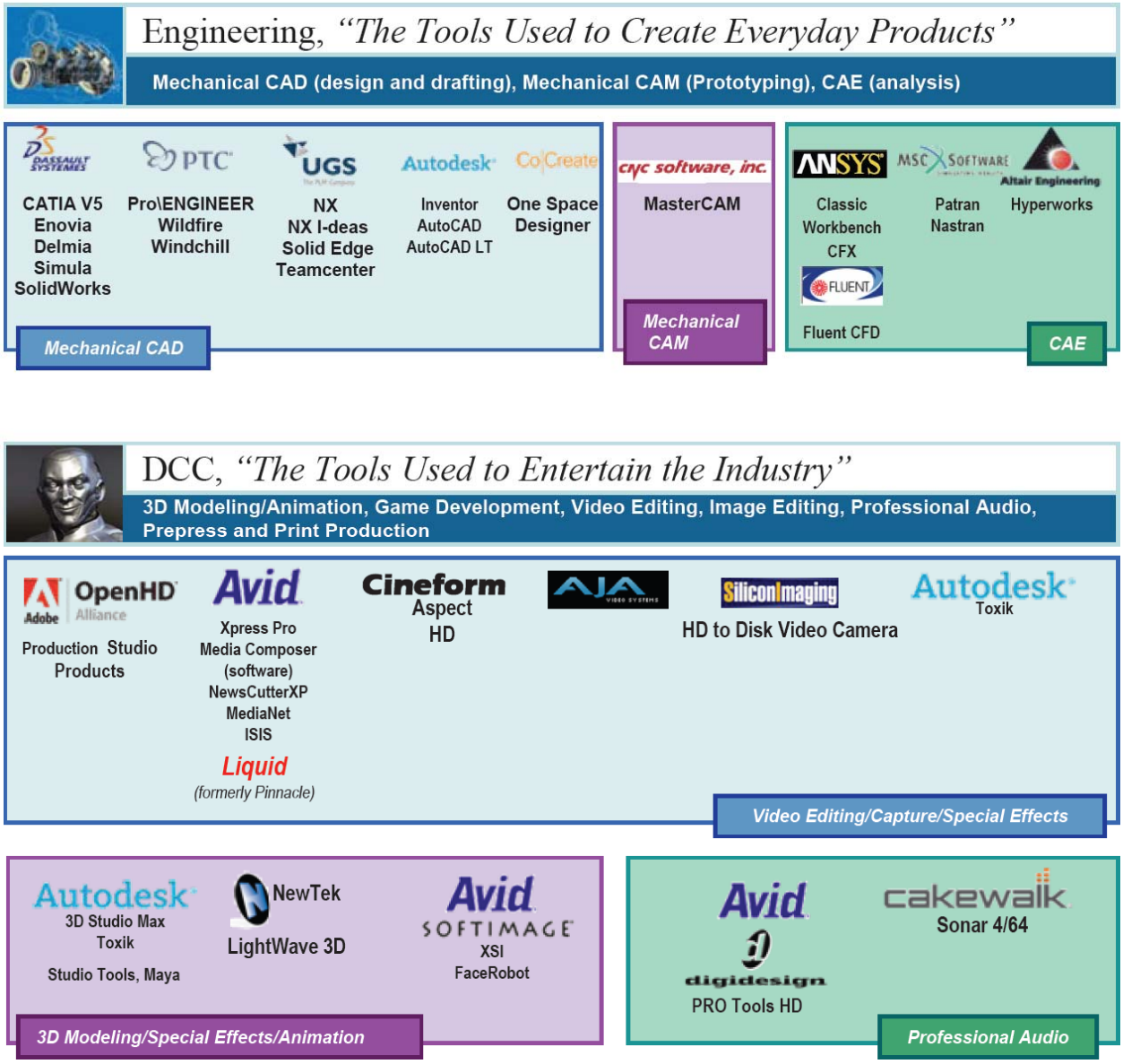
The 85% efficient power supply not only operates more efficiently than a traditional power supply but it is also wide-ranging, meaning no matter what the power source at the wall, the power supply will detect the wattage and adjust accordingly to help avoid power supply failures.

.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Applications and ISV Certifications

To meet the needs of demanding workstation users, Dell demands that professional workstation applications are rigorously tested and certified by the ISV (Independent Software Vendor) so that customers can be assured the maximum level of performance, functionality, and reliability of their solution. With dedicated development and testing resources, Dell's stringent workstation certification requirements are designed to deliver one benefit above all others: peace of mind.



PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Geoscience, *"The Tools Used to Explore, Drill and Maintain The Oil and Gas Industry"*

Upstream Analysis, Seismic Measuring and Interpretation, Oil Reservoir and Delivery Management

HALLIBURTON
Digital and Consulting Solutions
Landmark
GeoProbe

Schlumberger
GeoFrame
Petrel 32/64 (in process)

Paradigm
A VISION FOR ENERGY
Product Family

Upstream Exploration, Reservoir Management, Downstream Management and Maintenance

Medical Imaging/Scanning, Tools Used by Doctors and Scientists To Enhance Patient Care

CT/MRI Scanning, Gray and Color Scale Diagnostic Displays, Visual Medical Software

BARCO
Display Products
Certification

PLANAR
Display Products
Certification

IMAGEON
RadSuite
CardSuite

EDA (Electronic Design and Automation)
GIS (Geographic Information Systems)
AEC (Architectural, Engineering and Construction)

Circuitry and PCB Engineering, Mapping and Geo Exploration, Building and Infrustructure Design

Mentor Graphics
BoardStation EX Flow 2006
Expedition Flow 2005 SPac1
DMS 2005 SPac2
Pads Flow 2007

Autodesk
AutoCAD
AutoCAD LT

BENTLEY
MicroStation

Arc/INFO
Arc/VIEW
ESRI

Finance

Stock Trading, Market, Risk Analyses

Bloomberg
BrokerTec
Global Trade Tech

Murex
Market Axess
Thomson Financial

Intex Solutions
Reuters
...others

Dell Precision Customers drive these applications and others in the Finance World. Whether as a Trader's Station or computing risk analysis in the background, the strength of Dell Precision is necessary. These companies have no formal Cerification process.

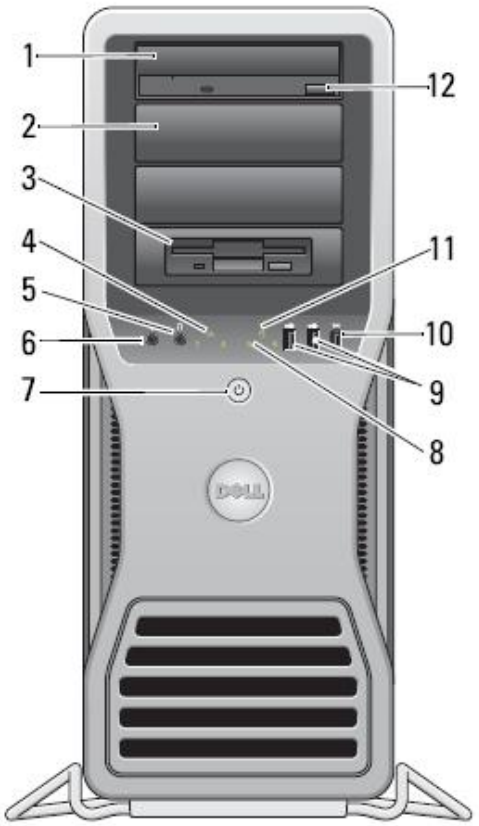
PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

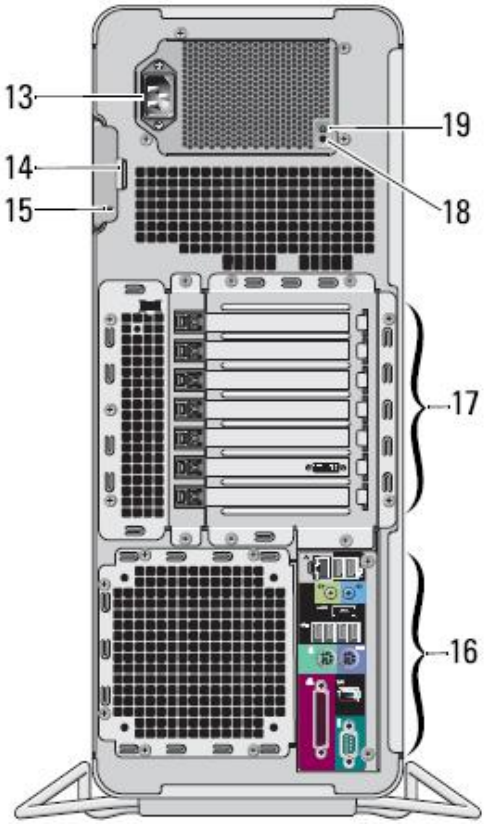
Detailed Technical Overview
And
Configuration Specifications

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

T7500 Front and Back View

Front and Back View



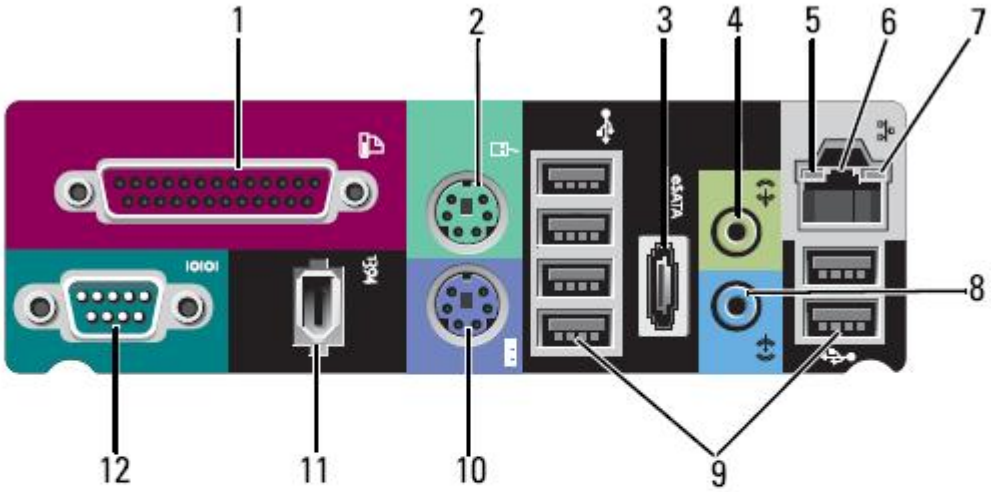


1	optical drive	2	optical drive filler panel
3	flex bay	4	link integrity light
5	headphone connector	6	microphone connector
7	power button, power light	8	diagnostic lights (4)
9	USB 2.0 connectors (2)	10	IEEE 1394 connector
11	drive activity light	12	optical drive eject button
13	power connector	14	cover-release latch and padlock ring
15	security cable slot	16	back panel connectors
17	expansion card slots (7)	18	power supply diagnostic button
19	power supply diagnostic light		

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

T7500 Back Panel Connectors

Back Panel Connectors

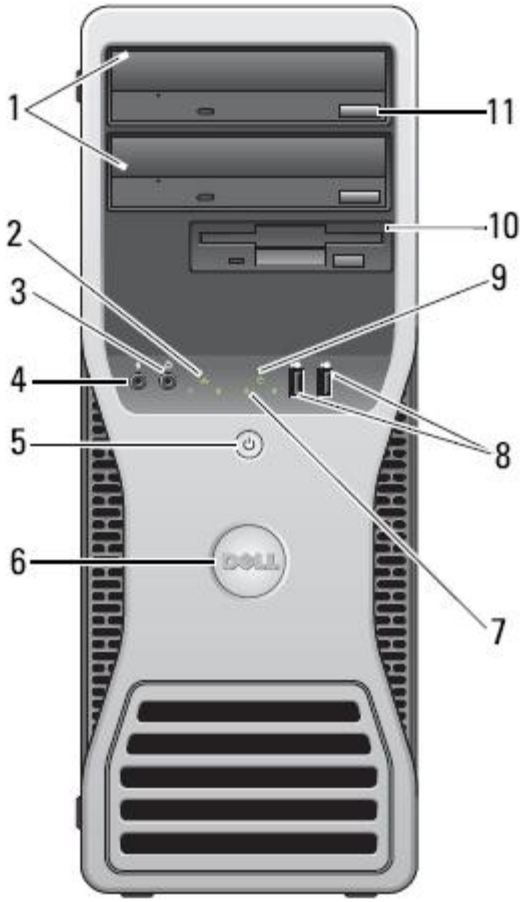


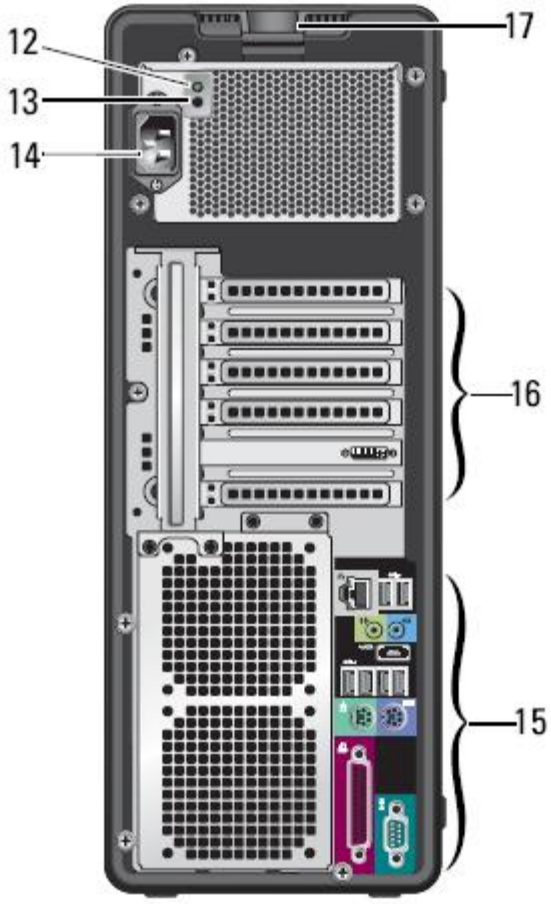
1	parallel connector	2	PS/2 mouse connector
3	eSATA connector	4	line-out connector
5	network activity light	6	network adapter connector
7	link integrity light	8	line-in connector
9	USB 2.0 connectors (6)	10	PS/2 keyboard connector
11	IEEE 1394 connector	12	serial connector

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

T5500 Tower Front & Back Views

Tower — Front and Back View



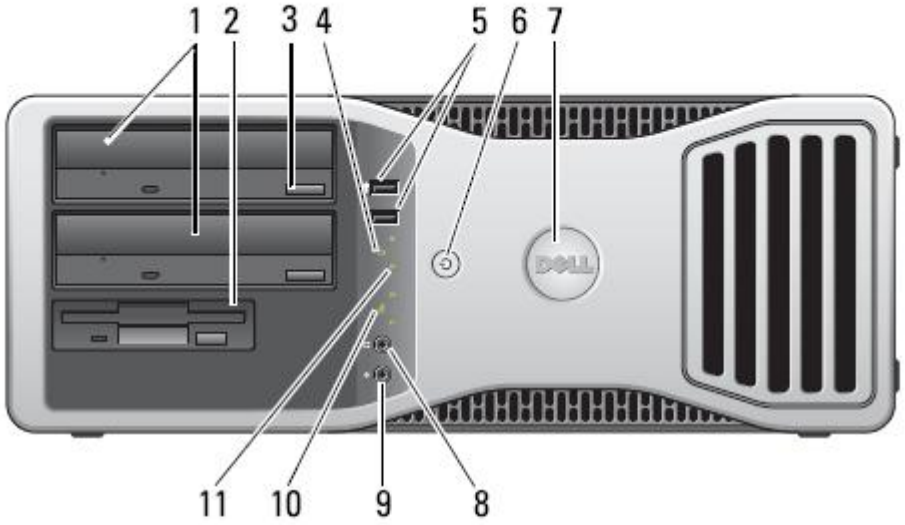


1	optical drives (2)	2	link integrity light
3	headphone connector	4	microphone connector
5	power button, power light	6	Dell rotatable badge
7	diagnostic lights (4)	8	USB 2.0 connectors (2)
9	drive activity light	10	flex bay
11	optical drive eject button	12	power supply diagnostic light
13	power supply diagnostic button	14	power connector
15	back panel connectors	16	expansion card slots (6)
17	cover-release latch and padlock ring		

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

T5500 Desktop Front View

Desktop — Front View

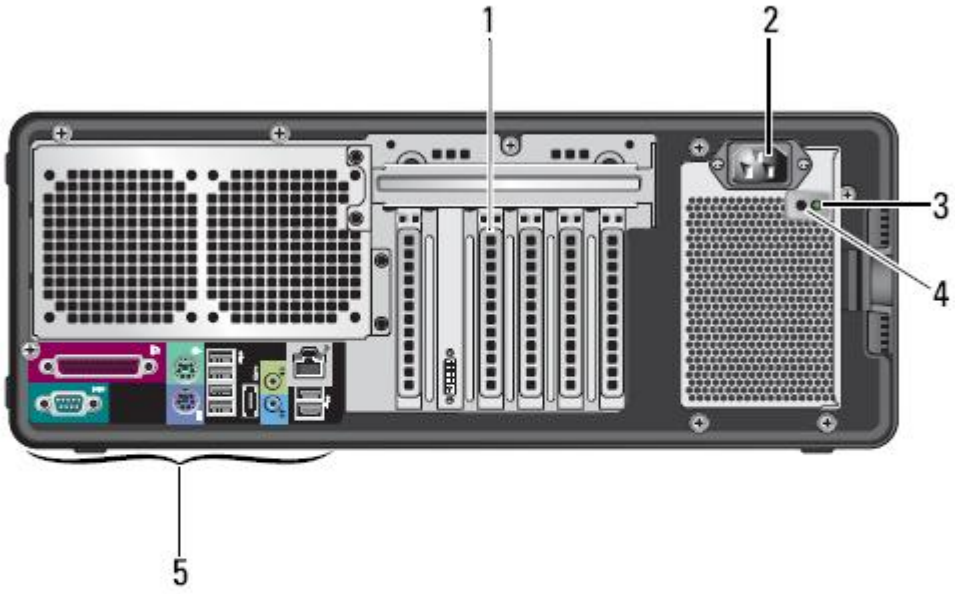


1	optical drives (2)	2	flex bay
3	optical drive eject button	4	drive activity light
5	USB 2.0 connectors (2)	6	power button, power light
7	Dell rotatable badge	8	headphone connector
9	microphone connector	10	link integrity light
11	diagnostic lights (4)		

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

T5500 Desktop Back View

Desktop — Back View

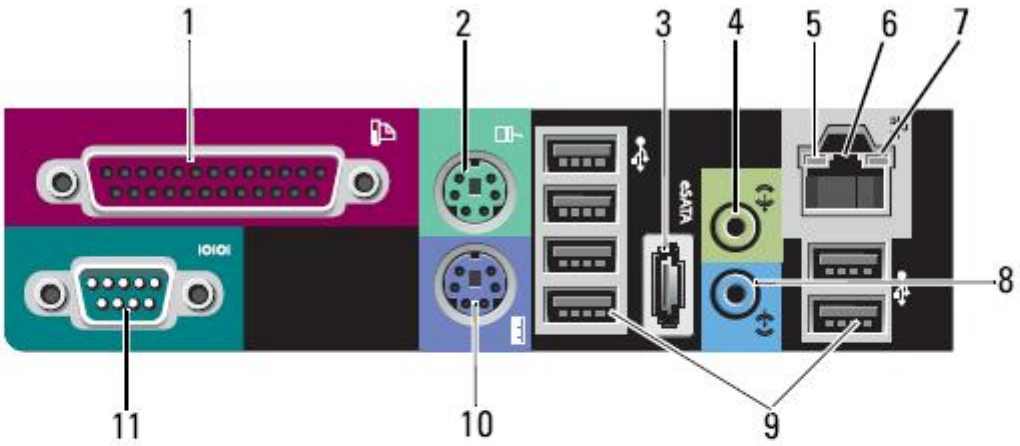


1	expansion card slots (6)	2	power connector
3	power supply diagnostic light	4	power supply diagnostic button
5	back panel connectors		

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

T5500 Tower and Desktop Back Panel Connectors

Tower and Desktop — Back Panel Connectors



1	parallel connector	2	PS/2 mouse connector
3	eSATA connector	4	line-out connector
5	network activity light	6	network adapter connector
7	link integrity light	8	line-in connector
9	USB 2.0 connectors (6)	10	PS/2 keyboard connector
11	serial connector		

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Graphics Card Choices

4GB PCIe x16 NVIDIA Quadro® FX 5800, 2DP+1DVI
1.5GB PCIe x16 NVIDIA Quadro® FX 4800, 2DP+1DVI
1GB PCIe x16 NVIDIA Quadro® FX 3800, 2DP+1DVI
768MB PCIe x16 NVIDIA Quadro® FX 1800, 2DP+1DVI
512MB PCIe x16 NVIDIA Quadro® FX 580, 2DP+1DVI
256MB PCIe x16 NVIDIA NVS 295, 2DP
1GB PCIe x16 ATI™ FirePro™ V8700, 2DP+1DVI
512MB PCIe x16 ATI™ FirePro™ V5700, 2DP+1DVI
256MB PCIe x16 ATI™ FirePro™ V3750, 2DP+1DVI

NVIDIA Quadro FX 5800

Bus Type	PCIe x16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	4GB GDDR3 with memory bandwidth up to 102GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	189W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 2.1 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital-DP)
External connectors	2 DP + 1 DVI

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

NVIDIA Quadro FX 4800

Bus Type	PCIe x16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	1.5GB GDDR3 with memory bandwidth up to 76.8GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	150W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 2.1 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital-DP)
External connectors	2 DP + 1 DVI

NVIDIA Quadro FX 3800

Bus Type	PCIe x16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	1GB GDDR3 with memory bandwidth up to 51.2 GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	107W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 3.0 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital)
External connectors	2 DP + 1 DVI

NVIDIA Quadro FX 1800

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

NVIDIA Quadro FX 1800

Bus Type	PCIe X16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	768MB GDDR3 with memory bandwidth up to 38.4 GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	59W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 3.0 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital)
External connectors	2 DP + 1 DVI

NVIDIA Quadro FX 580

Bus Type	PCIe x16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	512MB GDDR3 with memory bandwidth up to 25.6GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	40W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 3.0 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital)
External connectors	2 DP + 1 DVI

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

NVIDIA NVS 295

Bus Type	PCIe X16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	256MB DDR3 with memory bandwidth up to 11.2 GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	23W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 3.0 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital-DP)
External connectors	2 DP

ATI FirePro V8700

Bus Type	PCIe X16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	1GB GDDR5 with memory bandwidth up to 108.8 GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	160W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 2.1 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital)
External connectors	2 DP + 1 DVI

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

ATI FirePro V5700

Bus Type	PCIe X16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	512MB GDDR3 with memory bandwidth up to 28.8 GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	58W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 2.1 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital)
External connectors	2 DP + 1 DVI

ATI FirePro V3750

Bus Type	PCIe X16
GPU Core Clock	
Frame Buffer Memory (onboard and shared) Size and Speed	256MB GDDR3 with memory bandwidth up to 24.4 GB/sec
Frame buffer bus width	64-bit
Maximum Power Consumption	47W
Overlay Planes	Yes
Maximum Color Depth	32-bit
Maximum Vertical Refresh Rate	85 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL® 2.1 & DirectX® 10
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	Up to 2560x1600 (Digital)
External connectors	2 DP + 1 DVI

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

System Configurations

NOTE: Offerings may vary by region.

Operating System

NOTE: One of the following Operating Systems will be preinstalled.

		T5500	T7500
Windows Vista® operating system **(default unless another is chosen)**	Windows Vista® Ultimate (32 and 64 bit), Windows Vista® Business (32 and 64 bit) (SP1 when available)		
Windows® XP support via a Windows Vista downgrade	Windows® XP Professional SP2 (32 and 64 bit)		
Other	Red Hat® Enterprise Linux® 5.3 64-bit Factory Installed, Suse® SLED Linux (China only), FreeDOS		
OS Media Support		X	X

Chipset

		T5500	T7500
Chipset			
Intel® 5520 Chipset		X	X
TPM 1.2 Security Device (Trusted Platform Module) (where available)		16KB located at TPM1P2 on chipset	16KB located at TPM1P2 on chipset
Broadcom® 5761 Gigabit Ethernet Controller		X	X

Processor Choices

NOTE: Processor numbers are not a measure of performance. All processors are quad-core except for the E5502

Processor (speed, GT/s, wattage, cache)

Intel® Xeon® Processor X5580 3.20GHz, 6.4GT/s, 130 watts, 8MB L3 cache
Intel® Xeon® Processor X5570 2.93GHz, 6.4GT/s, 95 watts, 8MB L3 cache
Intel® Xeon® Processor X5560 2.80GHz, 6.4GT/s, 95 watts, 8MB L3 cache
Intel® Xeon® Processor X5550 2.66GHz, 6.4GT/s, 95 watts, 8MB L3 cache
Intel® Xeon® Processor E5540 2.53GHz, 5.86GT/s, 80 watts, 8MB L3 cache
Intel® Xeon® Processor E5530 2.40GHz, 5.86GT/s, 80 watts, 8MB L3 cache
Intel® Xeon® Processor E5520 2.26GHz, 5.86GT/s, 80 watts, 8MB L3 cache
Intel® Xeon® Processor E5506 2.13GHz, 4.8GT/s, 80 watts, 4MB L3 cache
Intel® Xeon® Processor E5504 2.04GHz, 4.8GT/s, 80 watts, 4MB L3 cache

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Processor (speed, GT/s, wattage, cache)

Intel® Xeon® Processor E5502 1.86GHz, 4.8GT/s, 80 watts, 4MB L3 cache – DUAL CORE

Memory

A 64-bit operating system is required to support 4GB or more of system memory. For the Dell Precision T7500, more than 96GB of memory requires a second processor and Microsoft® Windows Vista® 64-bit, Windows® XP 64-bit or Red Hat® Enterprise Linux® and more than 128GB memory requires a second processor and Red Hat® Enterprise Linux®. For the Dell Precision T5500, more than 48GB requires a second processor. With over 72GB, memory will only run at up to 800MHz.

	T5500	T7500
Memory Type	Per processor: Three channel DDR3 unbuffered and registered DIMM memory - ECC only	Per processor: Three channel DDR3 unbuffered and registered DIMM memory - ECC only
DIMM Slots	Up to 9	Up to 12
DIMM Capacities	Up to 8GB	Up to 16GB
Minimum Memory Configuration	2GB	2GB
Maximum Memory with two processors	72GB[5]	192GB[3]

External System I/O Ports

See chassis diagrams section for port/connector locations

USB 2.0	**11 (2 front, 3 internal on motherboard, 6 rear)**
Ethernet Network (RJ45)	**1**
eSATA	**1**
Microphone and Headphone Jacks	**2 front and 2 rear**
1394	**2 integrated on T7500, Optional via add-in card on T5500.**
Parallel	**1**
Serial	**1**
PS2	**2**

Security

Software	Trusted Platform Module 1.2 (TPM 1.2)*, Optional Chassis Intrusion, Setup/BIOS Password

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Hardware	Kensington Lock, Loop Lock, Internal front panel chassis lock

*****TPM 1.2 not available in some regions.

Controllers

Intel Chipset SATA controller	Integrated SATA controller for optical and HDD support on T5500 (RAID 0, 1, 5, 10) Optical drive support on T7500
Integrated LSI controller	SAS and SATA HDD support on T7500 (RAID 0,1)
SAS6/ir card	SAS controller card for T5500 (RAID 0,1)
PERC6/I card	SAS and SATA Hardware RAID card for T5500/T7500 RAID 0,1,5,10)

Communications

Network Adapter	Integrated Broadcom® 5754 Gigabit Ethernet controller with Remote Wake UP and PXE support
Modem	Dell 56K v.92 Data/Fax PCI Modem

Broadcom® 5754 Gigabit Ethernet Controller

External Connector Type	RJ45
Data Rates supported	10/100/1000 Mbps
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCI-e V1.1x1
Integrated memory	N/A
Data transfer mode (example Bus-Master DMA)	N/A
Power consumption (full operation per data rate connection speed)	1000 Mbps: 680 mW 100 Mbps: 238 mW 10 Mbps: 221 mW
Power consumption (standby operation)	No Link (low power mode): 55mW No Link (w/ WOL): TBD 10 Mbps Idle (w/ WOL): 141 mW 100 Mbps Idle (w/ WOL): 238 mW
IEEE standards compliance (example 802.1P)	802.3, 802.3ab, 802.3u
Hardware Certifications (example FCC, B, GS mark…)	N/A
Boot ROM Support	PXE, RPL
Network Transfer Mode	
Network Transfer Rate	Full duplex at 10, 100, or 1000 Mbps and half duplex at 10 or 100 Mbps.
Environmental	

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Broadcom® 5754 Gigabit Ethernet Controller

Operating temperature	-20° C to 70° C (-4° F to 158° F)
Operating humidity	20% to 80% (non-condensing)
Manageability (examples WOL, PXE..)	WOL, PXE
Management Capabilities Alerting (examples ASF 2.0 AM2400…)	ASF2.0

V.92 Data/Fax Modem

Bus	PCI
External Connector	RJ-11

Audio

Integrated High Definition Audio

High Definition Stereo support	X
Number of Channels	2
Number of Bits / Audio resolution	
Sampling Rate (recording/playback)	
Signal to Noise Ratio	
Analog Audio	
Audio Jack Impedance	
Microphone	150 kΩ
Line-In	150 kΩ
Line-Out	190 Ω
Headphone	.5 Ω
Internal Speaker Power Rating	1 Watt/Speaker

Speakers

Internal System Speaker	Optional
Dell A225 Speakers	Optional
Dell AX510 Flat Panel Speakers (Sound Bar)	Optional
Dell AX510PA Flat Panel Speakers (Sound Bar)	Optional

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Keyboard and Mouse

Dell USB Entry QuietKey Keyboard	Optional
Dell USB Enhanced Multimedia Keyboard	Optional
Dell Smart Card USB Keyboard	Optional
Dell Bluetooth Keyboard and Mouse	Optional
Dell USB Entry 2 Button Scroll Mouse	Optional
Dell USB Optical 2 Button Scroll Mouse	Optional
Dell USB Premium 5 Button Mouse	Optional

Service and Support

NOTE: For more details on Dell Service Plans please to go to www.dell.com/service/service_plans/

3 Year Limited Hardware Warranty[1]	Standard
Dell ProSupport Options	Optional
Data Protection Options	Optional
Asset Protection Options	Optional

[1] For copy of Ltd Hardware Warranty, write Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see www.dell.com/warranty.

Software

Dell ControlPoint	Standard
Wave EMBASSY® Trust Suite	Standard
Norton Internet Security	30 Day Trial or Optional Subscription

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Detailed Engineering Specifications

Graphics and GPU Compute Cards

	T5500	T7500
Optional OpenGL Graphics Cards (one card must be selected). All systems support two of the same cards unless stated.		
ATI® FirePro® 3750 with 256MB GDDR3 Dedicated Graphics Memory[4]	X	X
ATI® FirePro® 5700 with 512MB GDDR3 Dedicated Graphics Memory[4]	X	X
ATI® FirePro® 8700 with 1GB GDDR5 Dedicated Graphics Memory[4]	X	X
NVIDIA Quadro® NVS 295 with 256MB GDDR2 Dedicated Graphics Memory[4]	X	X
NVIDIA Quadro FX 580 with 256MB GDDR3 Dedicated Graphics Memory[4]	X	X
NVIDIA Quadro FX 1800 with 1GB GDDR3 Dedicated Graphics Memory[4]	X	X
NVIDIA Quadro FX 4800 with 1.5GB GDDR3 Dedicated Graphics Memory[4]	X	X
NVIDIA Quadro FX 5800 with 4GB GDDR3 Dedicated Graphics Memory[4]	1 card only	X
NVIDIA Tesla C1060 GPU with 4GB GDDR3, 240 cores, PCIe x16 double width card	1 card only	1 card only

Detailed Engineering Specifications

System Dimensions (Physical)

	T5500	T7500
Weight	17.7 kg (39lb)	24.9 kg (55lb)
Chassis Dimensions: (HxWxD)		
Height	17.64”/44.8cm with feet	22.26” / 56.54cm incl. feet and without stand
Width	6.73”/17.1cm with feet	8.5” / 21.59cm

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

Depth	18.54"/47.1cm max including badge	21.2" / 53.85cm
Packaging Parameters (HxWxD)		
Height inches/centimeters	Dimensions Vary based on Region	
Width inches/centimeters	Dimensions Vary based on Region	
Depth inches/centimeters	Dimensions Vary based on Region	

System Level Environmental and Operating Conditions

	T5500, T7500
Temperature	
Operating	10° to 35°C (50° to 95°F)
Non-Operating (Storage)	-40° to 65° C (-40° to -149° F)
Relative Humidity	20% to 80% (non-condensing)
Maximum vibration	
Operating	5 to 350 Hz at 0.0002 G2/Hz
Non-Operating	5 to 500 Hz at 0.001 to 0.01 G2/Hz
Maximum Shock	
Operating	40 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 20 in/sec [51 cm/sec])
Non-Operating	105 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 50 in/sec [127 cm/sec])
Maximum Altitude	
Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Non-Operating	–15.2 to 3048 m (–50 to 35,000 ft)

Power Consumption

	T5500	**T7500**
Power Supply[8]	875W	1100W
AC Input Voltage Range	100-240V	100-240V
AC Input Current (low AC range/high AC range)	4.62A	6.7A
AC Input Frequency	50-60Hz	50-60Hz
Minimum Efficiency (Energy Star Qualified)	65%	65%
85% Efficient Power Supply	Y	Y

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

EPEAT Gold	Y	Y
3.3v CMOS battery (type and estimated battery life)	3-V CR2032 lithium coin cell. Est. 5 year life	

Power Management

Power Management	
ACPI Wake-Up Event	**System Wakes From**
Power Button	Suspend or soft-off
RTC Alarm	Suspend or soft-off
Wake On LAN (w/NIC)	Suspend or soft-off
PME	Suspend or soft-off
Serial Port Ring	N/A
USB	Suspend only
Keyboard	Suspend only
Mouse	Suspend only
BIOS Information	
BIOS address	F0000h
BIOS chip (NVRAM)	16 Mb - SMBIOS 2.5 support
Setup Option	Default Factory Value
PATA drives	N/A
SATA drives	N/A
SATA Operation	RAID On (T5500) / AHCI (T7500)
SAS Controller	Enable (T7500 only)
1394 Controller	On (T7500 only)
XPS LED color	N/A
Audio	On
Onboard Modem	N/A
Flex bay	N/A
CPU XD Support	On
Integrated NIC	Enable
PS2 Mouse	N/A
USB Controller	Enable
Front USB	On
Module bay	N/A
Serial Port #1	Auto
Parallel Port	PS/2
Parallel Port Address	378h
Diskette Drive	USB
Onboard Video	N/A
Onboard Video buffer	N/A
Primary Video	Option 2
Suspend mode	S3
Chassis intrusion	On-Silent
TPM Security	Off

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

SMART Reporting	Off
A/C Recovery	Power Off
Low Power Mode	Off(except energy Star)
Password (Administator & System)	Not Set
POST Hotkeys	Boot Menu
Numlock LED	On
Keyboard Errors	On
Remote Wake Up	Disable
HDD Acoustic Mode	Bypass
SATA Password	Not Set
Hyper-Threading Technology	On
Multi Core Support	On
Intel(R) SpeedStep™	Off
Virtualization	Off
Limit CPUID Value	Off
Auto Power on	N/A
Auto On Time	Disable
SERR Messages	On
Fast Boot	On
Intel(R) Turbo Boost Technology	On
C States Control	On
Hardware Prefetcher	On
Adjacent Cache Line Prefetcher	On
Memory Node Interleaving	SMP (T7500 DP)
VT for Direct I/O	Off
Computrace®	Off
ASF Mode	Disable

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37

1. Source: IDC WW Quarterly Workstation Tracker, May 2009
2. Based on the SPEC apc 3D Studio Max 9 and Cinebench R10 benchmark tests performed by Dell Labs in January 2009 comparing the Dell Precision T7400 with Intel® Xeon® X5482 processor and 4GB memory with the Dell Precision T7500 with Intel® Xeon® W5580 processor and 6GB memory.
3. More than 96GB of memory requires a second processor and Genuine Microsoft® Windows Vista® 64-bit or Genuine Windows® XP 64-bit and more than 128GB memory requires a second processor and Red Hat® Enterprise Linux®. A 64-bit operating system is required to support 4GB or more of system memory. With over 72GB, memory will only run at up to 800MHz.
4. Significant system memory may be used to support graphics, depending on system memory size and other factors.
5. Maximum memory with dual processors installed. A 64-bit operating system is required to support 4GB or more of system memory.
6. A 64-bit operating system is required to support 4GB or more of system memory.
7. GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.
8. The T7500 and T5500 use a very efficient Active Power Factor Correction (APFC) power supply. Dell recommends only Universal Power Supplies (UPS) based on Sine Wave output for APFC PSUs, not an approximation of a Sine Wave, Square Wave, or quasi-Square Wave (see UPS Technical Specifications). If you have questions, please contact the manufacturer to confirm the output type.

PLEASE SEE IMPORTANT INFORMATION ON PAGE 37