

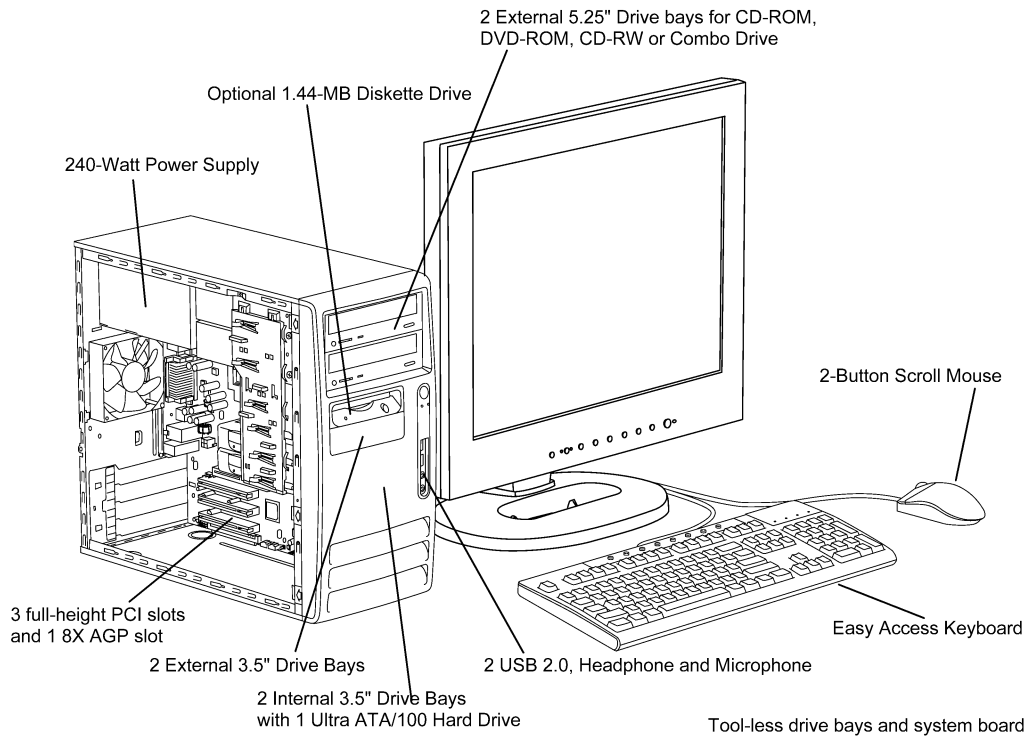
Overview

At A Glance

- AMD Athlon™ XP processors
- NVIDIA nForce2 chipset with Integrated 64-MB NVIDIA GeForce4 MX Graphics
- Integrated dual-monitor VGA connections built in with NVIDIA nView Multi-display software standard
- Supports up to 2-GB of PC 2700 (DDR 333) Synch DRAM Memory
- Dual channel memory support
- 4 rear USB 2.0 ports and 2 front USB 2.0 ports
- Integrated audio with internal speaker
- Integrated 3COM 10/100 NICLOM (Lan on Motherboard)
- 8X AGP slot
- Energy Star compliant with energy-saving features
- Protected by HP Services, including a 3-1-1, standard warranty. Certain restrictions and exclusions apply.

Microtower

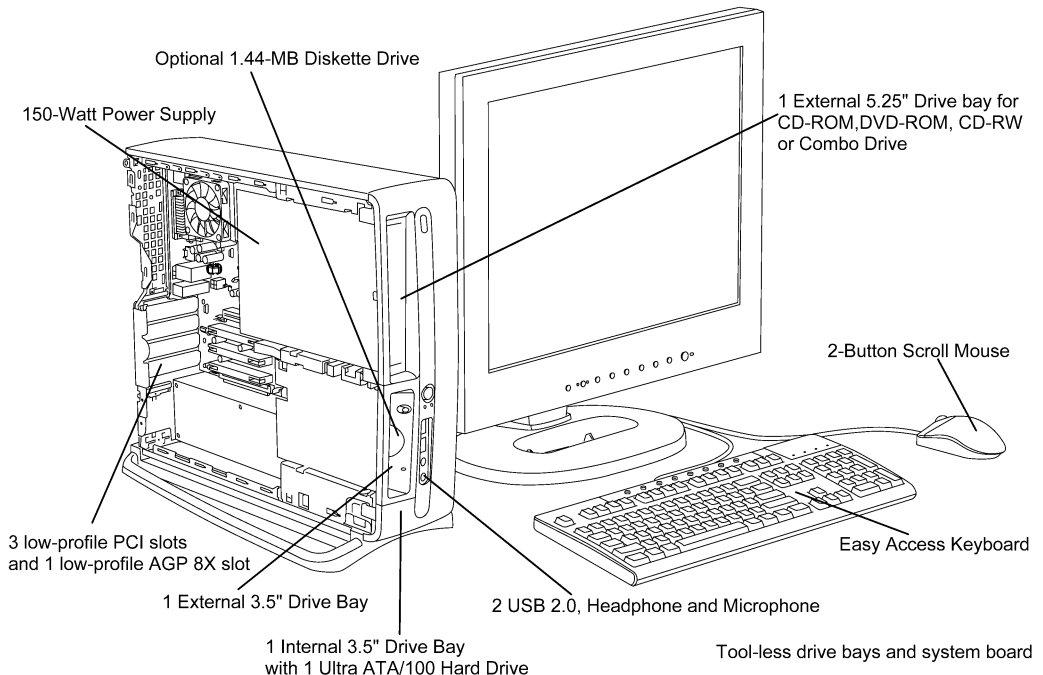
36.8 x 17.5 x 41.4 centimeters / 14.5 x 6.88 x 16.31 inches



Monitor Sold Separately

Slim Tower

33.78 x 10 x 38.3 centimeters / 13.3 x 3.95 x 15.1 inches



Monitor Sold Separately



Standard Features – Select Models

Pre-Configured Models

DE643A#ABA	d325m/A2600/40c/256/4U	HP d325 Microtower, nVidia nForce2 chipset, AMD Athlon XP 2600+ (2.13GHz), 256KB ECC L2 cache, 266MHz Front Side Bus, 256MB PC2700 DDR (1x256), Integrated nVidia GeForce4 Dual-Head Graphics, 40GB Ultra ATA Hard Drive (7200 rpm), 48X CD-ROM Drive, Integrated SoundMax III audio with internal speaker, Integrated 3Com 10/100 networking, Microsoft Windows XP Professional SP1, Microsoft Works v7.0, Norton Antivirus 2003, PS/2 Easy Access Internet Keyboard, USB Optical Scroll Mouse, 3-year Parts, 1-year Labor, 1-year Onsite warranty
DE644A#ABA	d325m/A2800/40c/512/4U	HP d325 Microtower, nVidia nForce2 chipset, AMD Athlon XP 2800+ (2.08GHz), 512KB ECC L2 cache, 333MHz Front Side Bus, 512MB PC2700 DDR (1x512), Integrated nVidia GeForce4 Dual-Head Graphics, 40GB Ultra ATA Hard Drive (7200 rpm), 48X CD-ROM Drive, Integrated SoundMax III audio with internal speaker, Integrated 3Com 10/100 networking, Microsoft Windows XP Professional SP1, Microsoft Works v7.0, Norton Antivirus 2003, PS/2 Easy Access Internet Keyboard, USB Optical Scroll Mouse, 3-year Parts, 1-year Labor, 1-year Onsite warranty
DN718A#ABA	d325sT/A2400/40c/256/4U	HP d325 Slim Tower, nVidia nForce2 chipset, AMD Athlon XP 2400+ (2.00GHz), 266KB ECC L2 cache, 266MHz Front Side Bus, 256MB PC2700 DDR (1x256), Integrated nVidia GeForce4 Dual-Head Graphics, 40GB Ultra ATA Hard Drive (7200 rpm), 48X CD-ROM Drive, Integrated SoundMax III audio with internal speaker, Integrated 3Com 10/100 networking, Microsoft Windows XP Professional SP1, Microsoft Works v7.0, Norton Antivirus 2003, PS/2 Easy Access Internet Keyboard, USB Optical Scroll Mouse, 3-year Parts, 1-year Labor, 1-year Onsite warranty

Standard Features – Custom Components

Processor and Speed - One of the following			Microtower	Slim Tower
AMD Athlon Processors	Front Side Bus	Standard L2 Cache		
AMD Athlon XP 2400+ (2.00-GHz)	266-MHz	256-KB ECC	✓	✓
AMD Athlon XP 2600+ (2.13-GHz)	266-MHz	256-KB ECC	✓	
AMD Athlon XP 2800+ (2.08-GHz)	333-MHz	512-KB ECC	✓	
AMD Athlon XP 3000+ (2.17-GHz)	333-MHz	512-KB ECC	✓	
AMD Athlon XP 3200+ (2.33-GHz)	333-MHz	512-KB ECC	✓	
Hard Drives				
40-GB 7200 rpm SMART III Ultra ATA/100			✓	✓
40-GB 5400 rpm SMART III Ultra ATA/100			✓	✓
80-GB 7200 rpm SMART III Ultra ATA/100			✓	✓
160-GB 7200 rpm SMART III Ultra ATA/100			✓	✓
Standard Memory - One of the following				
128-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 128 DIMM)			✓	✓
256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 256 DIMM)			✓	✓
256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 128 DIMM)			✓	✓
512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 512 DIMM)			✓	✓
512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 256 DIMM)			✓	✓
1-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 1024 DIMM)			✓	✓
1-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 512 DIMM)			✓	✓
2-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 1024 DIMM)			✓	✓
Removable Storage				
Optional 1.44-MB Diskette Drive			✓	✓
Zip 250 Drive (available in 3.5")			✓	✓
16-MB, 64-MB, or 128-MB Drive Keys			✓	✓
Optical Storage - One of the following				
48X Max CD-ROM Drive			✓	✓
48X/24X/48X CD-RW Drive			✓	✓
16X/40X DVD-ROM with +R Read			✓	✓
48X/24X/48X/16X Combo CD-RW/DVD-ROM Drive			✓	✓
4X DVD+R/+RW Drive			✓	
NOTE: All DVD devices will be restricted to 256-MB or more system memory.				
I/O Card				
IEEE 1394a (FireWire 400) PCI Card			✓	

Standard Features – Custom Components

	Microtower	Slim Tower
Keyboard		
PS/2 Easy Access Keyboard	✓	✓
Wireless Easy Access Keyboard	✓	✓
Mouse		
PS/2 2-Button Scroll Mouse	✓	✓
USB Optical Scroll Mouse	✓	✓
Wireless Optical Scroll Mouse	✓	✓
Modem		
Lucent V.90 56K Win Modem	✓	✓
Audio		
Integrated Soundmax AC97 audio with premium internal speaker	✓	✓
NIC		
Integrated 3COM 3C920B-EMB Fast Ethernet Controller	✓	✓
Intel Pro 1000 MT NIC FH PCI adapter	✓	
Intel Pro 1000 MT NIC LP PCI adapter		✓
Graphics		
NVIDIA nForce2 GT chipset with Integrated NVIDIA GeForce4 MX 64-MB Graphics	✓	✓
NVIDIA GeForce4 MX-440-8 64-MB DDR Full Height 8X AGP VGA w/TV-out	✓	
NVIDIA GeForce4 MX-440-8 64-MB DDR Low Profile 8X AGP VGA w/TV-out		✓
Operating System – One of the following		
Microsoft Windows XP Home SP1	✓	✓
Microsoft Windows 2000 SP3	✓	✓
Microsoft Windows XP Professional SP1	✓	✓

Standard Features – Custom Components

Software (Microsoft Windows system only)	Microtower	Slim Tower
Norton AntiVirus 2003	✓	✓
Microsoft Works v7.0 (US only)	✓	✓
Microsoft Office XP Small Business Edition	✓	✓
Microsoft Office XP Professional	✓	✓
PDF Complete	✓	✓
Roxio EZ CD Creator v6 (included with all re-writeable optical drives)	✓	✓
CorelWordPerfect (US English only) (on CD)	✓	✓
Intervideo WinDVD v4 (included with all DVD drives)	✓	✓
MyDVD Suite v4 (included on CD with all DVD +R/+RW drives)	✓	✓
HP Restore Plus! Kit / OS CD	✓	✓
Dantz Restrospect Backup v6 (included on CD with all re-writeable optical drives)	✓	✓
Open Office Productivity Suite on CD (LA only)	✓	✓
Security		
Chassis Clamp Lock with Cable (sold as an accessory)	✓	✓
Chassis Clamp Lock without Cable (sold as an accessory)	✓	✓
Rear Port Controller Cover	✓	✓
Solenoid Lock (sold as an accessory)	✓	✓
Miscellaneous		
Tower Stand (included in all configuration)		✓
Wall Mount Bracket with Security Sleeve (sold as an accessory)		✓
Intelligent Manageability		
Downloadable from HP Intelligent Manageability at: http://h18000.www1.hp.com/im/		

Standard Features – Base Unit Details

Base Unit Contents	Microtower	Slim Tower
AMD processor, heatsink	✓	✓
System board with NVIDIA nForce2 chipset	✓	✓
(2) ATA Cables	✓	✓
Optional diskette drive with cable	✓	✓
Audio cable	✓	✓
Quick Setup booklet	✓	✓
Getting Started guide	✓	✓
Product Documentation on CD	✓	✓
HP OS CD and HP Restore CD	✓	✓
Warranty booklet	✓	✓
Power Cord	✓	✓
PS/2 Easy Access Keyboard	✓	✓
PS/2 Scroll Mouse or USB Optical Mouse (North America)	✓	✓

Expansion Capability

Memory Expansion Slots (Non-ECC)	2 DIMM slots	2 DIMM slots
Maximum Memory	2-GB (1-GB per slot maximum)	2-GB (1-GB per slot maximum)
Slots		
PCI	3 full-height, full-length	3 low-profile
AGP	1 full-height, full length 8X AGP	1 low-profile AGP 8X
Bays	Total Bays = 6	Total Bays = 3
Internal	(2) 3.5-inch hard drive bays	(1) 3.5 inch ATA Hard Drive
External	(2) full-length 5.25-inch	(1) 5.25 inch full-length
	(2) full-length 3.5-inch	(1) 3.5 inch full length
Wireless Support	PCI card or external USB	PCI card or external USB
USB Support	(2) Front USB 2.0 Ports	(2) Front USB 2.0 Ports
	(4) Rear USB 2.0 Ports	(4) Rear USB 2.0 Ports

NOTE: 2 USB ports can be high-speed, (USB 2.0), and divide the total possible 480Mb/s bandwidth. The remaining 4 ports, if used at the same time, are USB 1.1 and divide up a total of 12Mb/s between them.

Interfaces (Legacy)

Parallel Port	1	1
Serial Port	1	1
PS/2 Keyboard	1	1
PS/2 Mouse	1	1
VGA Adapter	2	2
Chassis Dimensions (H x W x D) Centimeters	36.8 x 17.5 x 41.4	33.78 x 10 x 38.3
Chassis Dimensions (H x W x D) Inches	14.5 x 6.88 x 16.31	13.3 x 3.95 x 15.1
System Weight	24.0 lbs	22.2 lbs
System Volume	1651 sq. in. (27.0 liters)	859 sq. in. (14.1 liters)
Shipping Weight	32 lbs	30.5 lbs.
Packaged Unit Dimensions (H x W x D)	22.20 x 13.00 x 23.50 in	22.125 x 18.75 x 13.375 in

Standard Features – Base Unit Details

System Memory	Microtower	Slim Tower
Type/Speed	DDR Synch DRAM PC2700 (333-MHz) Non-ECC and DDR Synch DRAM PC2100 (266-MHz) Non-ECC	DDR Synch DRAM PC2700 (333-MHz) Non-ECC and DDR Synch DRAM PC2100 (266-MHz) Non-ECC
Maximum Memory	2 GB (1-GB per slot maximum)	2 GB (1-GB per slot maximum)
Memory Parity	Not Needed for non-ECC	Not Needed for non-ECC
ECC Memory	Not Supported by chipset	Not Supported by chipset
Serial Presence Detect Support	Supported	Supported
Dual channel memory Support	Yes. Requires two equal size and type memory modules	Yes. Requires two equal size and type memory modules.

Supported Features

Processor	AMD Athlon XP	AMD Athlon XP
CPU Bus Speed Supported	333 or 266-MHz FSB	333 or 266-MHz FSB
Memory Type Supported	DDR (ECC not supported by Chipset)	DDR (ECC not supported by Chipset)
Memory Speed Supported	DDR Synch DRAM PC2700 (333 MHz) or PC2100 (266-MHz) Non-ECC	DDR Synch DRAM PC2700 (333 MHz) or PC2100 (266-MHz) Non-ECC
Serial Presence Detect Support	Yes	Yes
Hard Drive Interfaces Supported	SMART III Ultra ATA/100/66/33	SMART III Ultra ATA/100/66/33
Hard Drive Controller (PCI) Supported	SMART III Ultra ATA/100/66/33	SMART III Ultra ATA/100/66/33

AMD Athlon XP

Coprocessor	Integrated	Integrated
CPU Socket Type/Number	Socket A	Socket A
CPU Package	FC-PGA	FC-PGA
Front Side Bus Speed	333 or 266-MHz	333 or 266-MHz
Standard L2 Cache	512-KB ECC or 256-KB ECC, depending on processor	512-KB ECC or 256-KB ECC, depending on processor
L2 Cache Architecture / Speed	Full core clock speed	Full core clock speed
Cache Upgradeable To	Not upgradeable - Integrated into Processor	Not upgradeable - Integrated into Processor

System Board

Architecture	Athlon XP / PCI / AGP 4X and 8X	Athlon XP / PCI / AGP 4X and 8X
Chipset	NVIDIA nForce2 chipset	NVIDIA nForce2 chipset
I/O Controller	SMSC LPC47B367 Super I/O	SMSC LPC47B367 Super I/O
System Board Form Factor	Standard uATX	Standard uATX
Processor Socket - 462 Pin ZIF	Yes	Yes
DIMM Connectors (2.5V)	Yes (2)	Yes (2)
AGP Connector (1.5V)	Yes (1) 8X AGP	Yes (1) 8X AGP
Integrated AGP Graphics	Yes	Yes
PCI Connectors	Yes (3 on system board)	Yes (3 on system board)
Flash ROM	Yes	Yes
Audio	Yes	Yes
CD ROM IN (Audio)	Yes	Yes
Clear CMOS	Yes	Yes
CPU Fan Header	Yes	Yes
Chassis Fan Header	Yes	Yes
Chassis Speaker Header	Yes	Yes
CMOS Battery Holder - Lithium	Yes	Yes
Hood Lock Header	Yes	Yes
Hood Sense Header	Yes	Yes

Standard Features – Base Unit Details

System Board <i>(continued)</i>	Microtower	Slim Tower
Multibay Header	No	No
Multiport Header	No	No
NIC supported features:		
WOL (Wake-On-Lan®)	Yes	Yes
AOL (Alert-On-LAN®)	No	No
SOS - Network based alerting	Yes	Yes
ASF (Alert Standards Format)	No	No
PXE (Pre-Boot Execution Environment)	Yes	Yes
Power Supply Header	Yes	Yes
Power Switch, Power LED and Hard Drive LED Header	Yes	Yes
Password Clear Header	Yes	Yes
Riser Connector	No	No
SCSI LED Header	No	No
ACPI-Ready Hardware	Yes	Yes
<ul style="list-style-type: none"> Advanced Configuration and Power Management Interface (ACPI). It allows the system to wake from a low power mode. It controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. 		
Dual-State Power Button	Yes	Yes
<ul style="list-style-type: none"> Power button acts as both an on/off button and suspend-to-sleep button. 		
Chassis		
Color	Carbonite/Silver	Carbonite/Silver
System Board Form Factors Supported	Standard uATX	Standard uATX
Cooling Solutions Supported		
Power Supply Fan (Variable Speed)	Yes	Yes
Processor Fan-Heatsink (Variable Speed)	Yes	Yes
Chassis Fan	Yes	Yes
Front I/O	Standard Front Headphone, Microphone, and (2) USB 2.0	Standard Front Headphone, Microphone, and (2) USB 2.0
Rear I/O	Standard ATX I/O Connectors (4 USB 2.0, 1 VGA, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ45)	Standard ATX I/O Connectors (4 USB 2.0, 1 VGA, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ45)
Internal Speaker	Yes	Yes
Security Locks Supported	Kensington Cable Lock (optional)	Kensington Cable Lock (optional)
	Hood Cover Security Loop (standard but Lock not included)	Hood Cover Security Loop (standard but Lock not included)
	Solenoid Hood lock (optional)	Solenoid Hood lock (optional)

Standard Features – Base Unit Details

Interfaces	Microtower	Slim Tower
I/O Chip	SMSC LPC47B367 Super I/O	SMSC LPC47B367 Super I/O
Serial Port / UART Type	One Serial Port	One Serial Port
Parallel Port	One Parallel Port	One Parallel Port
USB	6 USB 2.0 ports (4 rear/2 front)	6 USB 2.0 ports (4 rear/2 front)
Infrared Port	No	No
Network	RJ-45	RJ-45
Keyboard	Yes (PS2 and USB)	Yes (PS2 and USB)
Mouse	Yes (PS2 and USB)	Yes (PS2 and USB)
Multibay	No	No
Video	Yes	Yes
Audio	Yes	Yes

Power Supply

Power Supply	240-watt ATX power supply – PFC 115v/230v line switch	150-watt ATX power supply – PFC 115v/230v line switch
Full Ranging Input (No Line Select Switch)	No	No
Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS)	No	No
Passive Power Factor Correction (PFC)	Yes (with line switch set to 230V - No PFC in 115V line switch position)	Yes (with line switch set to 230V - No PFC in 115V line switch position)
Operating Voltage Range	90 to 132VAC, or 180 to 264VAC	90 to 132VAC, or 180 to 264VAC
Rated Voltage Range	100 to 127VAC, or 200 to 240VAC	100 to 127VAC, or 200 to 240VAC
Rated Line Frequency	50-60 Hz	50-60 Hz
Operating Line Frequency Range	47-63 Hz	47-63 Hz
Rated Input Current	6A @ 100VAC/3A @ 200VAC	5A @ 100VAC/2.5A @ 200VAC
Maximum Rated Power	240 watt	150 watt (system rated for 130W maximum)
Heat Dissipation	Max (369W input): 1260 BTU/hr Typical (75W input): 256 BTU/hr Max (369W input): 317 kg-cal/hr Typical (75W input): 65 kg-cal/hr	Max (200W input): 683 BTU/hr Typical (75W input): 256 BTU/hr Max (200W input): 172 kg-cal/hr Typical (75W input): 65 kg-cal/hr
PS Fan	92mm fan integrated in power supply - variable speed for optimum acoustics	PS cooling achieved via ducting of airflow from processor fan.
Processor Fan	Variable speed fan	Variable speed fan

Environmental and Mechanical Engineering Support Center

<http://env-webserver.ccm.cpqcorp.net/EMESC/default.htm>

Power Conservation 'Energy Saver'

Energy Star Compliant	Yes	Yes
APM 1.2 Support	No	No
Screen Blanking	Yes	Yes
Hard Disk 'Idle' Mode	Yes	Yes
System Idle Mode	Yes	Yes
Cache Memory Power-Down	No	No
Blue Angel Compliant (<5w in S5--Power Off)	Yes	Yes
Power Consumption in ES Mode - Suspend to RAM (S3) (Instantly Available PC)	~2W	~2W
Processor/Cache Memory Power-Down (S3)	Yes	Yes
CD-Rom Spins Down when not in use	Yes	Yes

Standard Features – Base Unit Details

Supported Operating System	Microtower	Slim Tower
DOS	No	No
Windows 3.1	No	No
Windows 95	No	No
Windows 98	No	No
Windows NT 4.X	No	No
Windows 2000 / Windows XP Pro dual-install	No	No
Windows 2000	Yes	Yes
Windows XP Pro	Yes	Yes
Windows XP Home	Yes	Yes
Mandrake Linux 9.1.4 light	Yes	Yes

Intelligent Manageability		
Intelligent Manageability Home Page	http://h18000.www1.hp.com/im/	http://h18000.www1.hp.com/im/
Insight Management Agent	Yes (via web download)	Yes (via web download)
Plug and Play Ready	Yes	Yes
Windows 2000	Yes	Yes
Windows XP Pro	Yes	Yes
Windows XP Home	No	No
Mandrake Linux 9.1	No	No
Boot Support		
Local Diskette Boot	Yes	Yes
Network Boot	Yes (with PXE supported NICs)	Yes (with PXE supported NICs)

Standard Features – Base Unit Details

ROM Features	Description	Microtower	Slim Tower
Instantly Available PC (Suspend to RAM - S3)	Allows for very low power consumption with quick resume time	Yes	Yes
ROM Based F10 Setup	Allows for reviewing and customizing BIOS settings	Yes	Yes
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup	Yes	Yes
Remote System Installation via F12 (PXE)	Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server	Yes	Yes
Failsafe Boot Block ROM	-----	Yes	Yes
Emergency ROM Flash Recovery (BootBlock)	User is alerted with audible tones and keyboard LEDs only	Yes	Yes
CMOS Archive and CMOS Restore	By holding the power button down, allows the last known good BIOS settings (from previous restart) to be restored if the system gets into a locked up state after configuration changes are made	Yes	Yes
Save and Restore CMOS Setup via Diskette	-----	Yes	Yes
Auto Setup when New Hardware Installed	System automatically detects addition of new hardware (e.g. memory, floppy, etc.)	Yes	Yes
Serial, Parallel, USB Enable/Disable Port Control	Allows the user to enable or disable serial, parallel or USB ports	Yes	Yes
Removable Media Write / Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	Yes	Yes
Remote Boot from Server	Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server	Yes	Yes
Network Server Mode	Allows for secured keyboard-less operation on PS/2 devices	Yes	Yes
Power-On Password	Prevents an unauthorized person from booting up the computer	Yes	Yes
Setup Password	Prevents an unauthorized person from changing the system configuration	Yes	Yes
Memory Change Alert (Requires Insight Management Agent)	Alerts management console if memory is removed or changed	Yes	Yes
Thermal Alert (Requires Insight Management Agent)	<ul style="list-style-type: none"> Monitors the temperature within the chassis. There are three operational states that a computer can experience: <ul style="list-style-type: none"> NORMAL – operating under normal temperature ranges ALERTED - operation when excessive temperatures are detected. Will raise a flag so that appropriate action can be taken to avoid shutdown or provide for a smoother system shutdown SHUTDOWN – when excessive temperatures are encountered. Will automatically shutdown the computer without warning before hardware component damage occurs 	Yes	Yes
Cover Removal Alert (Requires Insight Management Agent for network alerts)	<ul style="list-style-type: none"> Assists with asset security and control by notifying the Network Administrator and end user when the cover has been removed without authorization. Is an electronic switch residing inside the computer which can be set to any one-of-three modes depending on the amount of control desired: <ul style="list-style-type: none"> DISABLED - the user/network administrator does not want to be made aware of the computer hood removal NOTIFY USER – notifies user/network administrator that the hood has been removed, but no action required before re-booting the computer SETUP PASSWORD – notifies user/network administrator that the hood has been removed and administrator password is required before the computer will continue to boot 	Yes	Yes

Standard Features – Base Unit Details

ROM Features	Description	Microtower	Slim Tower
Master Boot Record Security	Allows for detection of changes to MBR and optional restoration, useful in protecting from viruses	Yes	Yes
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	Yes	Yes
Power Management	-----	Yes	Yes
ACPI Ready	-----	Yes	Yes
SMBIOS (previously known as DMI)	System Management BIOS, previously known as DMI BIOS, for system management information	Yes	Yes
Keyboard-less Operation	The system can be operated without a keyboard	Yes	Yes
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	Yes	Yes
Remote Wakeup / Remote Shutdown	<ul style="list-style-type: none"> Allow a system administrator to power on, restart, and power off a client computer from a remote location. This enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM. 	Yes	Yes
ROM Based Setup (F10) and Start-up Diagnostics	-----	Yes	Yes
System Environmental Specs			
Acoustics: Advanced Power Management – On	Seated operator position	Idle (Hard drive spinning but not seeking) = 23 dBA	Idle (Hard drive spinning but not seeking) = 27 dBA
Shock			
Operating (*Using 11-ms half-sine shock pulse)	-----	5 G's* (with no damage being incurred)	5 G's* (with no damage being incurred)
Non-Operating (*Using 11-ms half-sine shock pulse)	-----	10 G's*, positive and negative directions front to back axis: 20 G's* in all other axes	10 G's*, positive and negative directions front to back axis: 20 G's* in all other axes
Vibration			
Operating	-----	Random vibration at 0.000215 G ² /Hz, 10Hz to 300Hz, (0.25G's nominal)	Random vibration at 0.000215 G ² /Hz, 10Hz to 300Hz, (0.25G's nominal)
Non-Operating	-----	Random vibration at 0.0005 G ² /Hz, 10Hz to 500Hz, (0.5G's nominal)	Random vibration at 0.0005 G ² /Hz, 10Hz to 500Hz, (0.5G's nominal)
Relative Humidity			
Operating (maximum wet bulb temp., non-condensing)	-----	10% to 90% relative humidity (Rh), 28°C	10% to 90% relative humidity (Rh), 28°C
Non-operating (maximum wet bulb temp., non-condensing)	-----	5% to 95% relative humidity (Rh), 38.7°C	5% to 95% relative humidity (Rh), 38.7°C
Altitude Max (un-pressurized)			
Operating (Maximum allowable altitude change rate is 1500 ft/min.)	-----	0 to 3,048 meters/ 10,000 feet – This value may be limited by the type and number of options installed.	0 to 3,048 meters/ 10,000 feet – This value may be limited by the type and number of options installed.
Non-operating (Maximum allowable altitude change rate is 1500 ft/min)	-----	0 to / 9,144 m/30,000 ft	0 to / 9,144 m/30,000 ft

Standard Features – Base Unit Details

Initial Configuration and Deployment		Microtower	Slim Tower
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup	Yes	Yes
Support Software CD	-----	Yes	Yes
HP Software Restore CD	Allows the computer to be restored to its original factory shipping image	Yes	Yes
Altiris eXpress Solutions (30-day trial version)	A suite of solutions that focus on business needs in four areas, saving time and freeing resources to address other crucial issues: <ul style="list-style-type: none"> • Deployment & Migration • Software & Operations Management • Inventory & Asset Management • Help Desk & Problem Resolution 	http://h18000.www1.hp.com/im/	http://h18000.www1.hp.com/im/
Asset Tracking			
Asset Tracking and Security Home Page	-----	http://h18000.www1.hp.com/im/swdeploy/dt_nb.html	http://h18000.www1.hp.com/im/swdeploy/dt_nb.html
Asset Tag	<ul style="list-style-type: none"> • Intended to be used as a repository for storing company-specific property asset numbers for easy tracking • Initially set equal to the system serial number • Stored in a protected section of non-volatile memory which can be accessed and modified with the F10 Setup program 	Yes	Yes
DIMM Serial Presence Detect	Detects whether or not memory DIMMs are present and their type	Yes	Yes
Hard drive serial number, model, and manufacturer	Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM based F10 setup	Yes	Yes
Monitor serial number, model & manufacturer		Yes	Yes
System serial number, model, & manufacturer	System serial number, model, & manufacturer stored in a non-volatile memory and can be retrieved with management software or viewed in ROM based F10 setup	Yes	Yes
ROM revision levels	<ul style="list-style-type: none"> • System ROM revision levels are identified by a version number (xx.yy) and reported in ROM based F10 Setup • Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information 	Yes	Yes
System board revision level	<ul style="list-style-type: none"> • Allows management SW to read the revision level of the system board • Revision level is digitally encoded into the hardware and cannot be modified 	Yes	Yes
Memory Change Alert (Intelligent Manageability needed to work)	Alerts management console if memory is removed or changed	Yes	Yes
Ownership Tag	A user defined string stored in a non-volatile memory that is displayed on the BIOS splash screen	Yes	Yes

Standard Features – Base Unit Details

Security Features of Chassis		Microtower	Slim Tower
Solenoid Hood Lock	-----	Yes	Yes
Hood Sensor	-----	Yes	Yes
Kensington Lock Support	-----	Yes	Yes
Cable Lock Provision	Allows the user to physically secure computer hardware from theft via a loop on the chassis. With lock installed, this loop also prevents the hood from being removed.	Yes	Yes
Serial, Parallel, USB Enable/Disable	Allows the user to enable or disable serial, parallel or USB ports and hide them from the operating system	Yes	Yes
Port Control	Device which attaches to back of chassis covering external ports and thereby preventing unauthorized access; also aids in cable management	Yes	Yes
Removable Media Write / Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	Yes	Yes
Power-On Password	Prevents an unauthorized person from booting up the computer	Yes	Yes
Setup Password	Prevents an unauthorized person from changing the system configuration	Yes	Yes
SmartCard Reader	Security device that prevents system access into the operating system unless the user has the appropriate Smartcard	Optional	Optional
Fault Notification and Recovery			
Fault Management Home Page	-----	http://h18000.www1.hp.com/im/	http://h18000.www1.hp.com/im/
SMART Hard Drives, Fault Notification, & Prefailure Warranty	<ul style="list-style-type: none"> Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure 	Yes	Yes
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000V	Yes	Yes
Ultra ATA Integrity Monitoring (CRC Checking)	<ul style="list-style-type: none"> Provides data transfer verification. Provides proactive notification of hard drive data transmission problems and recommendations for enhancing system performance Detects all the following errors types: <ul style="list-style-type: none"> single bit errors double bit errors an odd number of errors error bursts up to 32-bits long 	Yes	Yes
ATA RAID Controller Option	-----	No	No
System Software Updating			
Support Software CD & website	-----	Yes	Yes

Standard Features – Base Unit Details

Serviceability Features – System		Microtower	Slim Tower
Dual Color Power LED on Front of Computer	Indicates normal operations and fault conditions	Yes	Yes
Blinking Power LED Codes	Allows for easy problem resolution	Yes	Yes
Diagnostic LED Explanation Table	Number of 1-second blinks (red LED) Diagnosis – followed by a 2 second pause/ repeat: 2 = Processor Thermal Protection Activated 3 = Processor not installed 4 = Power Supply Failure 5 = Memory Error 6 = Video Error 7 = PCA failure (ROM detected failure prior to video) 8 = Invalid ROM, bootblock recover mode	Yes (Available at http://www.compaq.com/support/techpubs/illustrated_parts_map)	Yes (Available at http://www.compaq.com/support/techpubs/illustrated_parts_map)
Emergency ROM Flash Recovery	-----	Yes	Yes
Compaq Diagnostic for Windows Software	-----	Yes	Yes
Compaq Configuration Record Software	-----	Yes	Yes
Over-Temp Warning on Screen (Requires IM Agents)	-----	Yes	Yes
HP OS CD (Restore OS CD)	Allows the computer to be restored to its original factory shipping image	Yes	Yes
HP Restore CD (Restores Drivers CD)	Allows the computer to be restored to its original factory shipping image	Yes	Yes
Flash ROM	-----	Yes	Yes
3.3V Aux Power LED on System PCA	-----	Yes	Yes
Dual Function 5V Aux Power LED (ON) / PS_ON LED (OFF) on System PCA	-----	Yes	Yes
Diagnostic Power Switch LED on board	-----	Yes (On when power switch pushed)	Yes (On when power switch pushed)
Clear Password Jumper	-----	Yes	Yes
Clear CMOS Button		Yes	Yes
CMOS Battery Holder for easy Replacement	-----	Yes	Yes
Processor ZIP Socket for easy Upgrade	-----	Yes	Yes
DIMM Connectors for easy Upgrade	-----	Yes	Yes
NIC LEDs (integrated) (Green & Amber)	Used to determine NIC status	Yes (Green On = Network Activity; Amber On = 100Base-TX; Amber Off = 10Base-TX)	Yes (Green On = Network Activity; Amber On = 100Base-TX; Amber Off = 10Base-TX)

Standard Features – Base Unit Details

Serviceability Features		Microtower	Slim Tower
Tool-less PCI Card Removal	-----	Yes	Yes
Tool-less AGP Card Removal	-----	Yes	Yes
Dual Color Power and Hard Drive LED	Indicates Normal Operations and Fault Conditions	Yes	Yes
Diagnostic LED Explanation Table	-----	Yes (Available at http://www.compaq.com/support/techpubs/illustrated_parts_map)	Yes (Available at http://www.compaq.com/support/techpubs/illustrated_parts_map)
Emergency ROM Flash Recovery	-----	Yes	Yes
Smart Cover Sensor (Requires Insight Management Agent for network alerts)	<ul style="list-style-type: none"> Assists with asset security and control by notifying the Network Administrator and end user when the cover has been removed without authorization. Is an electronic switch residing inside the computer which can be set to any one-of-three modes depending on the amount of control desired: <ul style="list-style-type: none"> DISABLED - the network administrator does not want to be made aware of the computer hood removal NOTIFY USER - notifies network administrator that the hood has been removed, but no administrator action required before re-booting the computer SETUP PASSWORD - notifies network administrator that the hood has been removed and administrator password is required before re-booting the computer 	Yes	Yes
Solenoid Hood Lock	Remote operated system lock	Yes	Yes
Green Pull Tabs, and Quick Release Latches for easy Identification	-----	Yes	Yes
System memory can be upgraded without removing the system board or any internal components	Eases memory upgrading	Yes	Yes
Tool-less Hood Removal	Eases entry to the chassis without use of special tools	Yes (with captive thumbscrews)	Yes
Tool-less Hard Drive, CD & Diskette Removal	No special tools required for removal of devices in the 3.5" and 5.25" bays	Yes	Yes
Tool-less System Board Removal	No special tools required for system board removal	Yes	Yes
Industry-standard CD Bay	-----	Yes	Yes
Serviceability Features – Hard Drives			
Drive Self Tests (DPS)	<ul style="list-style-type: none"> Drive Protection System 	Yes	Yes
DPS Access through F10 Setup during Boot	<ul style="list-style-type: none"> A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. 	Yes	Yes
DPS Access through Diagnostics for Windows	<ul style="list-style-type: none"> Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard disk drive is the source of the problem and needs to be replaced. The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures 	Yes	Yes
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	<ul style="list-style-type: none"> Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count 	Yes	Yes
SMART I - Drive Failure Prediction		Yes	Yes
SMART II - Off-Line Data Collection		Yes	Yes
SMART III - Off-Line Read Scanning with Defect Reallocation	<ul style="list-style-type: none"> By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure 	Yes	Yes

Standard Features – Base Unit Details

Service and Support

On-site Warranty and Service ^{Note 1}: This three-year (3-1-1), limited warranty and service offering delivers three years of parts and one year of both labor and on-site repair. Response time is next business-day ^{Note 2} and includes free telephone support ^{Note 3} 24 x 7. Global coverage ^{Note 2} ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

After-Market Options

Communications			Microtower	Slim Tower
	Wireless			
	HP Wireless LAN 802.11b WL215 (WiFi) USB	191810-B22	✓	✓
	HP Wireless LAN 802.11b WL220 (WiFi) FH PCI	DC756B	✓	✓
	Networking			
	Intel Pro 1000 MT NIC FH PCI adapter	DC193A	✓	
	Broadcom NetXtreme Gigabit Ethernet NIC Full Height PCI	DC194A	✓	
	Modem			
	V.90 56K FH PCI Win Modem	239137-001 or DC131A#ABA	✓	✓
	V.92 56K USB Fax Modem	228141-001 or DE585A#ABA	✓	✓
Graphics	2D Single Head Graphics			
	NVIDIA GeForce4 MX-440-8 64-MB DDR FH&LP 8X AGP VGA w/TV-out	DC663A	✓	✓
	NVIDIA GeForceFX 128-MB DDR FH&LP 8X AGP VGA w/TV- out	DK906A	✓	✓
	2D Multi-Display Graphics			
	NVIDIA Quadro4 100NVS 64-MB DDR FH&LP AGP dualhead with VGA cables	DC665A	✓	✓
	NVIDIA Quadro4 100NVS DVI connector cables (for use with DC665A)	DC157A	✓	✓
Hard Drives & Controllers	SMART III Ultra ATA/100 Hard Drives with Drive Protection System (DPS)			
	40-GB 7200 rpm Ultra ATA/100 Hard Drive	201066-B21 DC180A	✓	✓
	80-GB 7200 rpm Ultra ATA/100 Hard Drive	250020-B21 DC181A	✓	✓
	160-GB 7200 rpm Ultra ATA/100 Hard Drive	DC189A	✓	✓
Input/Output Devices	Keyboards			
	PS/2 Easy Access Keyboard	DC167B#ABA	✓	✓
	USB Easy Access Keyboard	DC168B#ABA	✓	✓
	USB Smartcard Keyboard	DC169B	✓	✓
	Wireless Easy Access Keyboard with wireless optical mouse	DC170B	✓	✓
	Mice			
	PS/2 2-Button Scroll Mouse	DD440B	✓	✓
Memory (DIMMs)	333-MHz (PC2700) DDR DIMMs Non-ECC			
	128-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 128 DIMM)	DC338A	✓	✓
	256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 256 DIMM)	DC339A	✓	✓
	512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 512 DIMM)	DC340A	✓	✓
	266-MHz (PC2100) DDR DIMMs Non-ECC			
	128-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 128 DIMM)	282433-B21	✓	✓
	256-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 256 DIMM)	282434-B21 DC164A	✓	✓
	512-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 512 DIMM)	282435-B21 DC165A	✓	✓
	1-GB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 1024 DIMM)	282436-B21	✓	✓

After-Market Options

			Microtower	Slim Tower
Multimedia	JBL Platinum Series Speakers (carbon)	DE893B		✓
	PC Comm Station Pro (speaker, headphone, wireless keyboard and mouse)	302002-008 P8815A	✓	✓
	PC Comm Station (speaker and headphone)	304251-008 P8814A	✓	✓
Optical Drives	DVD-ROM Drives			
	16X/40X DVD-ROM with +R Read Drive (carbonite)	DC151B	✓	✓
	CD-ROM Drives			
	48X Max CD-ROM Drive (carbonite)	DC143B	✓	✓
	CD-RW Drives			
	48X/24X/48X CD-RW Drive (carbonite)	DC196B	✓	✓
	DVD+RW Drives			
	4X DVD+R/+RW Drive	DC517B	✓	✓
	Combo Drives			
	48X/24X/48X/16X Combo Drive CD-RW & DVD-ROM (carbonite)	DC197B	✓	✓
Removable Storage	ZIP 250 Drive (carbonite)	DC140B	✓	✓
	ZIP 750 Drive (carbonite)	DC518B	✓	✓
	TR5 10/20 GB IDE Tape Drive (carbonite)	DC139B	✓	✓
Security	Chassis clamp lock, universal, with cable	DE818A	✓	✓
	Chassis clamp lock, universal, no cable	DE817A	✓	✓
	Solenoid Lock	252076-B21	✓	
	Solenoid Lock	DE472A		✓
	Rear Port Controller Cover	DE897A	✓	
	Rear Port Controller Cover	DE899A		✓
	Wall Mount Bracket and Security Sleeve	DK412A		✓
PCI Card	PCI to PCMCIA Universal adapter for 3.5inch bay	DC680B	✓	✓
	1394 Firewire PCI Card	DE471A	✓	✓
USB Storage Options	128-MB USB Drive Key (Carbonite) "New Disk-On-Key ID"	DC190B	✓	✓

Memory

HP Business Desktop d325 Series

DDR SYNCH DRAM DIMM NON-ECC MEMORY

The HP business desktop d325 PC has two memory DIMM slots and supports dual channel memory configurations. It is not necessary to add memory in pairs or kits, but for best performance, memory should be added in pairs and should be the same type. For example, 2x128-MB memory modules will perform better on some applications than 1x256-MB memory module because of the dual channel memory support on the d325.

STANDARD MEMORY

Configurations can be selected with either a 128-MB, 256-MB, 512-MB, 1024-MB, or 2048-MB memory. Memory types supported include PC2100 (DDR266) and PC2700 (DDR333).

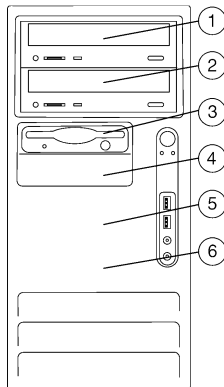
Various combinations of single-DIMM (for future upgradeability) and double-DIMM (for enhanced dual-channel memory performance) will be offered.

Other "mis-matched" memory combinations, such as 384MB (using 1x128-MB and 1x256-MB) will not be offered due to performance limitations of the d325. In these mis-matched configurations, the maximum operation speed is determined by slowest DIMM. After installing a mis-matched configuration, the following message will appear on the screen: "217 Memory DIMM Configuration Warning: Installed memory DIMM configuration is unbalanced. Multiple DIMMs installed of unequal size. For best performance, use a balanced DIMM configuration."

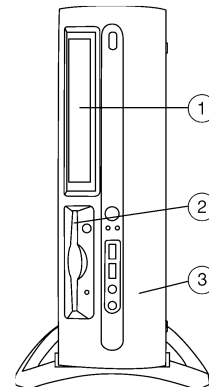
Memory Configuration	Slot 1	Slot 2
128-MB DDR266	128-MB	Empty
256-MB DDR266	128-MB	128-MB
256-MB DDR266	256-MB	Empty
128-MB DDR333	128-MB	Empty
256-MB DDR333	128-MB	128-MB
256-MB DDR333	256-MB	Empty
512-MB DDR333	256-MB	256-MB
512-MB DDR333	512-MB	Empty

NOTE: It is not necessary to add memory in pairs or kits. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

Storage



Microtower



Slim Tower

	Quantity Supported	Position Supported	Controller
Microtower			
Diskette Drive	1	3	Diskette
5.25" Storage Drive Bays	2	1, 2	IDE
3.5" Storage Drive Bays	3	4, 5, 6	IDE
Slim Tower			
Diskette Drive	1	2	Diskette
5.25" Storage Bays	1	1	IDE
3.5" Storage Bay	2	3	IDE

Technical Specifications – Audio

Integrated ADI 1981A Audio	Type	Integrated
	AC97 Stereo Codec	Yes
	OPL3 FM Synthesis Support	Yes
	Sound Blaster Compatibility	Yes
	Audio Jacks	Mic-In (20-K ohm Input Impedance) Line-In (12-K ohm Input Impedance) Line-Out * (less than 800 ohms Output Impedance, expects at least a 10-K ohm load) Headphone-Out (2.5 Ohms Output Impedance, expects at least a 32 ohm load)
	NOTE: *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.	
	Sampling	7 kHz – 48 kHz
	Compression	ADPCM, ESPCM
	Wavetable Syntheses (software)	Yes
	3D Positional Sound	No
Analog Audio	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	3W
	Internal Speaker	Yes
	Internal Tuned Port Speaker	Yes
	Hardware Equalizer for Internal Speaker	5 Band EQ
	External Speaker Jack (Line-Out)	Yes

Technical Specifications – Communications

Integrated 3Com 3C920B-EMB Fast Ethernet Controller	Manufacturer	3Com		
	Connector	RJ-45		
	Bus	32-bit PCI		
	Media	10BASE-T/100BASE-TX		
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, SOS alerting		
	Configuration	Network transfer rate	10BaseT (half-duplex) 10 Mbps 10BaseT (full-duplex) 20 Mbps 100BaseTX (half-duplex) 100 Mbps 100BaseTX (full-duplex) 200 Mbps	
		Data interface	PCI, 32-bit bus mastering	
		I/O address	Automatic I/O address	
		Interrupt level	Automatic IRQ setup	
		Standards compliance	PCI 2.2, PC'99, RWU	
		Drivers	Microsoft Windows Me, Microsoft Windows 2000, Microsoft Windows 9x, Microsoft Windows NT, Windows XP, Linux	
		Remote wakeup	Yes, PME	
		Operating distance	10BASE-T/100BASE-TX up to 100 meters (328 feet)	
		Proactive alert technology	No	
		Environmental operating requirements	Temperature	32° to 131° F (0° to 55° C)
			Humidity (non-condensing)	10% to 90%
			Power management	ACPI
			Network management	Any SNMP management medium including 3Com DynamicAccess® boot services, and 3Com DynamicAccess Managed PC Boot Agent
	Power		+ 3.3 V, 340 mA	
	LED indicators		100-Mbps link, 10-Mbps link, activity	
Dimensions	4.7 x 2.2 inches (12.0 x 5.6 cm)			

Technical Specifications – Communications

Intel Pro 1000 MT NIC	Connector	RJ-45
	Controller	Intel 82540EM Gigabit Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1A, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI 2.2
	Data path width	32-bit, 33/66 MHz bus interface
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	5V_PCI with 4.75V to 5.25V operating range
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T, 1000 Mbps
	Environmental	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
	Dimensions	4.7 x 4.7 x 0.8 inches (12.1 x 12.1 x 1.9 cm)
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility

Technical Specifications – Communications

Broadcom NetXtreme Gigabit Ethernet	Connector	RJ-45	
	Controller	Broadcom 5782 PCI LAN Controller	
	Memory	Integrated 96Kb frame buffer memory	
	Data rates supported	10/100/1000 Mbps	
	Compliance	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	Bus architecture	PCI 2.2	
	Data path width	32-bit, 33/66 MHz bus interface	
	Data transfer mode	Bus-master DMA	
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance	
	Boot ROM support	Yes	
	Network transfer rate	10BASE-T (half-duplex)	10 Mbps
		10BASE-T (full-duplex)	20 Mbps
		100BASE-TX (half-duplex)	100 Mbps
		100BASE-TX (full-duplex)	200 Mbps
		1000BASE-T, 1000 Mbps	
	Environmental	Operating temperature	32° to 131°F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Dimensions	4.7 x 2.0 x 0.08 inches (12 x 5 x 1.9 cm)	
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4	
Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility		
Alerting	ASF 1.0		

Technical Specifications – Communications

Lucent V.90 56K PCI Win Modem	Data Transmission	V.90/K56flex technology speeds: 56,000 Kbps maximum downstream data, controllerless
	NOTE:	56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600 / 31,200 / 28,800 / 26,400 / 21,600 / 19,200 / 16,800 / 14,400 / 12,000 / 9,600 / 7,200 / 4,800 / 2,400 / 1,200 / 300
	Data Standards	ITU V.90, ITU-T, V.34bis, V.22bis, V.22bis, V.21, V.23, Bell 212A, and Bell 103
	Fax speeds	14,400 / 12,000 / 9,600 / 7,200 / 4,800 / 2,400 / 1,200 / 300 b/s
	Fax mode capabilities	Group3 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2, Class 1
	Error Correction and Data Compression	V.44 (software upgradeable), 4.2bis, V.42 and MNP2-5
	Power Management	APM and ACPI states D0, D1, D2, and D3; meets PCI 2.2 requirements and PC'99 requirements
	Upgradability	Software driver upgradeable for v.92 and future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating temperature	32° to 104° F/0° to 40° C
	Operating humidity	20% to 80%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	Agere Systems 1648C (Mars 3.2)—Integrated PCI interface with 5-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI low profile specifications—6.7 x 2.3 inches (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Dual, parallel RJ-11 support with auxiliary Tip/Ring connector
	Other features	Digital line protection, call progress monitoring via on-board piezo device, transformer-based DAA design, support for high profile and low profile brackets, PnP ID supports via external EEPROM
	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals
	Health	Bare PCB material compliant to 94V-0 or better (marked as such), Microsoft Windows Me health compliant
	Other	PC'99 compliant, PCI version 2.2, WHQL approved; support for ACPI revision 1.1,

Technical Specifications – Graphics

Integrated NVIDIA GeForce4 MX 64-MB Graphics	3D/2D Controller	Integrated GeForce4 MX Graphics Processing Unit (GPU)		
	VGA Controller	Integrated		
	Bus Type	AGP8X for external graphics cards (Internal graphics is disabled if external AGP Graphics card is installed)		
	RAMDAC	Integrated 300-MHz DAC		
	Memory	Graphics memory is shared with system memory. Graphics memory usage can vary from 16 – 128MB depending on the amount of system memory installed and system BIOS settings.		
	Memory (Shared)	16-128MB DDR		
	Memory Bandwidth (max Shared)	5.3 GB/second		
	Triangles/Second (Max)	24 million		
	Fill Rate (Max)	760 Million texels/second		
	Controller Clock Speed	200 MHz		
	Overlay Planes	Support is fully compliant with Microsoft standard API such as Direct Draw and Direct Show.		
	Max Color Depth	32-bits/pixel		
	Maximum Vertical Refresh Rate	85 Hz at 1920x1200, 75Hz at 1920x1440, 60Hz at 2048x1536		
	Multi-display Support	"Yes. Two VGA ports integrated in system motherboard."		
Operating Systems	Microsoft Windows XP and Windows 2000			
Graphics API Support	Complete Microsoft DirectX® support, including DirectX 8.1; complete OpenGL® 1.3 support. Compatible with DirectX 9. NVIDIA Shading Rasterizer with 24 of 26 DX8 pixel shading functions and full set of OpenGL 1.3 pixel combiner operations in hardware.			
Resolutions Supported	Resolution	Maximum Refresh Rate (Hz)	Resolution	Maximum Refresh Rate (Hz)
	320 x 200	75	1280 x 1024	85
	320 x 240	75	1600 x 900	85
	400 x 300	75	1600 x 1200	85
	480 x 360	75	1920 x 1200	85
	512 x 384	75	1920 x 1440	75
	640 x 400	85	2048 x 1536	60
	640 x 480	85		
	800 x 600	85		
	1024 x 768	85		

Technical Specifications – Graphics

NVIDIA GeForce4 MX 440 Graphics Controller	3D/2D Controller	NV18 128-bit Graphics Processing Unit (GPU)	
	VGA Controller	Integrated	
	Bus Type	AGP8X	
	RAMDAC	350-MHz DAC	
	Memory	64-MB 128-bit DDR frame buffer memory	
	Controller Clock Speed	275 MHz	
	Overlay Planes	1	
	Stencil Planes	8-bit	
	Alpha Planes	8-bit	
	Z-buffer	32-bit	
	Total Bits/Pixel	32-bits/pixel	
	Maximum Vertical Refresh Rate	75 Hz at 2048 x 1536	
	Maximum Colors	32-bit color	
	Multi-display Support	Includes support for one CRT and TV simultaneously (VGA and S-Video connectors)	
	Operating Systems	Microsoft Windows XP and Windows 2000	
	Graphics API Support	Complete Microsoft DirectX® support, including DirectX 8.1; complete OpenGL® 1.3 support	
Resolutions Supported	Resolution	Maximum Refresh Rate (Hz)	
	640 x 480	150	
	800 x 600	150	
	1024 x 768	120	
	1280 x 1024	100	
	1600 x 1200	85	
	1920 x 1080	75	
	1920 x 1200	75	
	1920 x 1440	75	

Technical Specifications – Graphics

NVIDIA Quadro4 100 NVS Graphics Controller	3D/2D Controller	Integrated Quadro4 2D/3D 128-bit graphics processor unit (GPU)
	VGA Controller	Integrated into the Quadro4 GPU
	Bus Type	AGP 4x or PCI
	RAMDAC	Dual 350 MHz
	Memory Speed and Type	166MHz 8Mx16 DDR
	Memory Amount	64 MB
	Texture Memory	Unified with frame buffer
	Form Factor	ATX and SFF
	Controller Clock Speed	250 MHz
	Color Planes	32-bit color buffer
	Overlay Planes	1 16-bit Video overlay plane, software emulation for OpenGL overlay planes
	Stencil Planes	8-bit stencil buffer
	Alpha Planes	8-bit alpha buffer
	Z-buffer	24-bit
	Total bits/pixel	64
	Maximum Vertical Refresh Rate	120 MHz
	Maximum Pixel Clock	350 MHz
	Dual Screen Support	Yes, with nView
	Single DVI Support	Yes
	Dual DVI Support	Yes
	Operating Systems	Microsoft Windows XP, Microsoft Windows 2000
	nView Hardware Architecture	32-bit color 2048 x 1536 @ 60 Hz maximum resolution 2D rendering engine optimized for 32-, 24-, 16-, 15-, and 8-bpp modes
	High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
Resolution	Maximum Colors Supported	Maximum Refresh Rate
640 x 480	16.7 M	120 Hz
800 x 600	16.7 M	120 Hz
1024 x 768	16.7 M	120 Hz
1152 x 864	16.7 M	120 Hz
1280 x 1024	16.7 M	120 Hz
1600 x 1200	64 K	100 Hz
1600 x 1200	16.7 M	85 Hz
1920 x 1080	64 K	100 Hz
1920 x 1080	16.7 M	75 Hz
1920 x 1200	64 K	85 Hz
1920 x 1200	16.7 M	70 Hz
1920 x 1440	64 K	75Hz
1920 x 1440	16.7M	60Hz
2048 x 1536	64 K	60Hz

Technical Specifications – Hard Drives

7200 rpm SMART III Ultra ATA/100 Hard Drives 160-GB

Capacity	160,000 MB	
Rotational Speed	7200 rpm	
Interface	Ultra ATA/100	
Height	1 in/25.4 mm	
Width	3.5 in/88.9 mm	
Transfer Rate Synchronous (Maximum)	100 MB/s	
Seek Time (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
Physical Configuration	Logical Blocks	157,278,240
Operating Temperature	41° to 131°F/5° to 55°C	

80-GB

Capacity	80,000 MB	
Rotational Speed	7200 rpm	
Interface	Ultra ATA/100	
Height	1 in/25.4 mm	
Width	3.5 in/88.9 mm	
Transfer Rate Synchronous (Maximum)	100 MB/s	
Seek Time (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
Physical Configuration	Logical Blocks	157,278,240
Operating Temperature	41° to 131°F/5° to 55°C	

40-GB

Capacity	40,000 MB	
Rotational Speed	7200 rpm	
Interface	Ultra ATA/100	
Height	1 in/25.4 mm	
Width	3.5 in/88.9 mm	
Transfer Rate Synchronous (Maximum)	100 MB/s	
Seek Time (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
Physical Configuration	Logical Blocks	78,165,360
Operating Temperature	41° to 131°F/5° to 55°C	

Technical Specifications – Hard Drives

5400 rpm SMART III Ultra ATA/100 Hard Drives

Capacity	80,000 MB	
Rotational Speed	5400 rpm	
Interface	Ultra ATA/100	
Height	1 in/25.4 mm	
Width	3.5 in/88.9 mm	
Transfer Rate Synchronous (Maximum)	100 MB/s	
Seek Time (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
Physical Configuration	Logical Blocks	78,165,360
Operating Temperature	41° to 131°F/5° to 55°C	

40-GB

Capacity	40,000 MB	
Rotational Speed	5400 rpm	
Interface	Ultra ATA/100	
Transfer Rate Synchronous (Maximum)	66 MB/s	
Height	1 in/25.4 mm	
Width	3.5 in/88.9 mm	
Seek Time (typical reads, including settling)	Single Track	1.5 ms
	Average	10.5 ms
	Full-Stroke	23 ms
Physical Configuration	Logical Blocks	39,102,336
Operating Temperature	41° to 131°F/5° to 55°C	

Technical Specifications – Input/Output Devices

USB Easy Access Smartcard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country) plus eight programmable keys for Internet, shortcuts, or multimedia	
		Form factor	USB basic smartcard keyboard	
		Colors	Carbon	
		Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)	
		Weight	2 lb (0.9 kg) minimum	
Easy Access Keyboard (PS/2 or USB)	Dimensional	Dimensions (HxWxD)	1.4 x 18.3 x 6.3 in/36 x 465 x160 mm	
		Weight	Approximately 2 lbs/0.9 kg	
	Electrical	Operating Voltage	+5VDC ± 5%	
		Power Consumption	50 mA maximum (with 3 LEDs on)	
		System Interface	PS/2 mini-din connector	
		ESD	CE level 4, 15 kV air discharge	
		EMI-RFI	Conforms to FCC rules for a Class B computing device	
	Mechanical	PC98	Functionally compliant	
		Languages	30+ available	
		Keycaps	Low-profile design	
		Switch Actuation	55 g nominal peak force with tactile feedback	
		Switch Life	20 million keystrokes (using Hasco modified tester)	
		Switch Type	Contamination resistant membrane	
		Key Leveling Mechanism	For all double wide and greater length keys	
		Cable Length	6 ft/1.8 m	
		PC98-99	Mechanically compliant	
		Acoustics	50 dBA maximum sound pressure level	
	Environmental	Operating Temperature	50° to 122° F/10° to 50° C	
		Non-operating Temperature	-22° to 140° F/-30° to 60° C	
		Operating Humidity	10% to 90% (non condensing at ambient)	
Non-operating Humidity		20% to 80% (non condensing at ambient)		
Operating Shock		40 g, 6 surfaces		
Non-operating Shock		80 g, 6 surfaces		
Operating Vibration		2 g peak acceleration		
Non-operating Vibration		4 g peak acceleration		
Wireless/Optical Mouse	Dimensional	Dimensions (H x L x W)	1.76 x 5.11 x 2.92 in (44.7 x 130.0 x 74.2 mm)	
		Weight - Without Two AA Alkaline Batteries	0.24 lb (110 g)	
	System requirements	Microsoft Windows 2000 or XP		
		Available USB port for the receiver		
	Approvals	Product Safety	UL, CSA, TUV (Europe only), CE Mark	
		Ergonomics	ANSI; ISO (Europe only); GS Mark (Germany only)	
		EMC	FCC; CISPR; ACA, BSMI, MIC, VCCI	
		CE Mark	EN 55022:1998; EN 55024	
		Design Guidelines for PCs	PC 99 – connector overmold colors; PC 2001 – full functionality	
		Telecom	All local telecom requirements and approvals for intended markets	
USA		FCC Part 15 Equipment Certificate; CFR 47, Part 15; other local requirements		

Technical Specifications – Input/Output Devices

2-Button Scroll Mouse (PS/2 or USB)	Scroll Wheel	8 mm	
	Maximum Rotation Speed	30 mm/s	
	Switch Type	Light force micro-switch	
	Switch Life	1 million operations	
	Mechanical Life	Minimum 200,000 revolutions	
	Environmental	Operating Temperature	50° to 122° F/10° to 50° C
		Non-operating Temperature	-22° to 140° F/-30° to 60° C
		Operating Humidity	10% to 90% (non condensing at ambient)
		Non-operating Humidity	20% to 80% (non condensing at ambient)
		Operating Shock	40 g, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration
	Electrical	Operating Voltage	+5VDC ± 10%
		Power Consumption	15mA
		System Consumption	PS/2 mini-din connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		PC98	Functionally compliant
	Mechanical	Resolution	400 ± 20% DPI
Tracking Speed		10 in/s maximum	
Acceleration		100 in/s	
Switch Actuation		85 g nominal peak force	
Switch Life		1,000,000 operations (using Hasco modified tester)	
Cable Length		2 m	
PC98-99		Mechanically compliant	
Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick		
USB Optical Scroll Mouse	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in/3.8 x 11.6 x 6.3 cm	
	Weight	0.27 lb/0.12 kg	
	Cable length	72.8 in/185 cm	
	System requirements	IBM-compatible PC Microsoft® Windows® 95, 98, 2000, Me, and XP Available USB port	

Technical Specifications – Optical Storage

48X Max CD-ROM Drive	Interface	ATAPI IDE
	Data Buffer	16.6 Mbps
	Data Transfer Rate	Sustained—150 Kbps minimum Variable (CD)—3,000 to 7,200 Kbps (audio)
	Disk Rotation Technology	CAV (Constant Angular Velocity)
	Access Time (ms)	Random: <100 ms Full-stroke seek: <150 ms
	Average Access Time	< 80 ms
	Cache Buffer (standard/maximum)	128 KB
	Disk Formats Read	Multi-session Photo CD, multi-read CD-ROM, CD text, audio CD, CD-I, CD-RW, CD-R, CD-Extra, CD-ROM XA
	Disk Formats Written	None
	Disk Capacity (CD)	650 MB
	Block Size	Mode 1—2,048 bytes Mode 2—2,340/2,336 bytes CD-DA—2,352 bytes CD-XA—2,328 bytes
	Diameter	12 cm; 8 cm
	Thickness	1.2 mm
	Track Pitch	1.6 μ m
	Audio Output Level	Line-out—0.7 V @ 47 Kohm Headphone—0.6 V @ 32 ohm
	Startup Time	<7 seconds (typical); < 30 seconds with multi-session
	Operating Conditions	Temperature 41° to 113° F (5° to 45° C) Relative Humidity 10% to 80%
	Dimensions (H x W x D, maximum)	1.7 x 5.9 x 8.2 inches (4.3 x 15.0 x 20.8 cm)
	Weight	2.6 pounds (1200 g)
	Operating Systems Supported	Microsoft® Windows® NT 4.0, Microsoft Windows 2000, and Microsoft Windows XP.
	MPEG Playback Graphics Solution Support	None

Technical Specifications – Optical Storage

48X/24X/48X CD-RW Drive	Orientation	Either horizontal or vertical	
	Disc Loading Mechanism	Half-height, tray load	
	Interface Type	ATAPI IDE	
	Dimensions—external (W x H x D)	7.99 x 5.88 x 1.71 in/203 x 149.5 x 43.5 mm	
	Weight	2.6 lb/1.2 kg	
	Disc Diameter	12 cm, 8 cm	
	Disc Thickness	1.2 mm	
	Track Pitch	1.6 μ m	
	Disc Center Hole Diameter	15 mm	
	Reference Scanning Velocity	1.2 m/s	
	Recording/Playing Time	80 minutes with CD-R media	
	Read Only Disc Parameters	Formats and Modes Supported	CD-ROM—Mode 1; CD-ROM XA—Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I—Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD
		Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
		Block Size	Mode 1—2,048 and 2,352 bytes; mode 2, form 1—2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2—2,328; 2,336; 2,340 and 2,352 bytes; CD-DA—2,352 and 2,368 bytes
	Writeable Disc Parameters	Disc Type	CD-R and CD-RW
		Write Methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
		Format and Modes Supported	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD
		Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
		Block Size	Mode 1—2,048 bytes; mode 2, form 1—2,048 and 2,352 bytes; mode 2, form 2—2,352 bytes; CD-DA ---2,352 bytes
	Access Times (typical)	Random	< 120 ms
		Full Stroke	< 200 ms
	Data Transfer Rates	Sustained	CD-R write—1,800 KB/s (12X)
			CD-R write—2400 KB/s (16X)
			CD-RW write (1-4X media) —600 KB/s (4X)
			CD-RW write (4-10X media) —1,500 KB/s (10X)
			CD-RW write (4-12X media) —1,800 KB/s (12X)
		CD-RW read—3,600 KB/s (24X)	
	Variable	Digital audio extraction (minimum) —7,200 KB/s (48X)	
		CD-RW write—2,400 to 3,600 KB/s (16X to 24X)	
		CD-RW write—2,400 to 4,800 KB/s (16X to 32X)	
		CD-RW write—2,400 to 6,000 KB/s (16X to 40X)	
CD-RW write—2,400 to 7,200 KB/s (16X to 48X)			
CD-ROM, CD-R read—1,500 to 7,200 KB/s (10X to 48X)			

Technical Specifications – Optical Storage

48X/24X/48X CD-RW Drive (continued)	Data Transfer Modes	ATA PIO mode 4 (16.7MB/s) ; ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s) ;ATA UltraDMA mode 1 (24 MB/s) ; ATA UltraDMA mode 2 (33 MB/s) – default.		
	Cache Buffer	2 MB (minimum)		
	Start-up Time (single)	< 7 seconds typical		
	Start-up Time (multi-session)	< 30 seconds typical		
	Stop Time	< 4 seconds		
	Power	Source	Four-pin, DC power receptacle	
		DC power requirement	5 VDC \pm 5%	100 mV ripple p-p
			12 VDC \pm 5%	200 mV ripple p-p
		DC current	5 VCD	< 1A (typical) < 1200 mA (maximum)
			12 VCD	< 600 mA (typical) < 1.2A (maximum)
	Total Drive Power (Standby mode)	< 2.5 watt		
Audio Output Level	0.7 Vrms			
Configuration Jumper Block	Master, slave and cable select modes			
Data Interface Connector	50-pin IDE interface			
Environmental (all conditions, non-condensing)	Temperature (operating)	Operating 41° to 122° F (5° to 50° C)		
	Relative Humidity (operating)	10% to 85%		
	Maximum Wet Bulb Temperature (operating)	84° F (29° C)		

Technical Specifications – Optical Storage

16X/40X DVD-ROM with +R Read Drive	Height	5.25-in, half-height		
	Interface Type	ATAPI		
	Dimensions– External, Excluding Bezel (W x H)	5.88 x 1.71 in (149.5 x 43.5 mm)		
	Disc Diameter	12 cm, 8 cm		
	Disc Thickness	1.2 mm		
	Track Pitch	1.6 µm (CD), 0.74 µm (DVD)		
	Disc Center Hole Diameter	15 mm		
	Disc Formats	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW		
	Disc Capacity	DVD-ROM	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7 GB (DVD+R)	
		CD-ROM	540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)	
	Block Size (bytes)	DVD-ROM – 2048; CD-ROM Mode 0 – 2352; CD-ROM Mode 1 – 2352, 2340, 2336, 2048; CD-ROM Mode 2 – 2352, 2340, 2336, 2048		
	Access Times (typical reads, including settling)	DVD-ROM Single Layer	< 120 ms	
		CD-ROM Mode 1	< 90 ms	
		Full Stroke DVD	< 240 ms (seek)	
		Full Stroke CD	< 160 ms (seek)	
	Data Transfer Rates	2600 – 6000 KB/s (40X CAV CD-ROM mode)		
		8100 – 21,600 KB/s (16X CAV DVD-ROM mode)		
	Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)		
	Power	Source	Four-pin, DC power receptacle	
		DC Power Requirement	5 VDC ± 5% – 100 mV ripple p-p	
			12 VDC ± 5% – 200 mV ripple p-p	
	DC Current	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical		
	Audio Output Level	0.7 Vrms (typical)		
	Configuration Jumper Block	Master, slave, and cable select modes		
	Data Interface Connector	40-pin, shrouded and keyed, flat ribbon		
	Environmental (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)	
		Relative Humidity (operating)	10% to 85%	
Maximum Wet Bulb		86° F (30° C)		
Temperature (operating)				
Certifications, Approvals	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000.			
Operating Systems Supported	Microsoft Windows NT, Microsoft Windows 2000, and Microsoft Windows XP.			

Technical Specifications – Optical Storage

48X Combo CD-RW/DVD-ROM	5.25-inch, half-height, tray-load	
	Color	Carbonite
	Orientation	Either horizontal or vertical
	Interface Type	ATAPI
	Dimensions (W x H x D)	5.77 x 1.71 x 7.36 in (146.5 x 43.5 x 187 mm) (external, excluding bezel)
	Disc Diameter	12 cm, 8 cm
	Disc Thickness	0.05 in (1.2 mm)
	Track Pitch	1.6 um (CD), 0.74 um (DVD)
	Disc Center Hole Diameter	0.6 in (15 mm)
	Reference Scanning Velocity	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)
Read Only Disc Parameters	Formats and Modes Supported	CD-ROM—Mode 1; CD-ROM XA—Mode 2 (forms 1 and 2); CD-Bridge; CD digital audio; CD Extra; CD-I—Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session , and DVD+RW
	Capacity	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10)
	Block Size	Mode 1—2,048 and 2,352 bytes; mode 2, form 1—2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2—2,328; 2,336; 2,340 and 2,352 bytes; CD-DA—2,352 bytes; DVD—2,048 bytes
Writeable Disc Parameters	Disc Type	CD-R and CD-RW
	Write Methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	Format and Modes Supported	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD; CD-Bridge; Video CD
	Capacity	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (mode 2, 12 cm);
	Block Size	CD-DA—2,352 bytes; mode 0— 2,336 and 2,352 bytes; mode 1—2,048 and 2,352 bytes; mode 2—2,336 and 2,352; mode 2, form 1— 2,048 and 2,352 bytes; mode 2, form 2—2,324 and 2,352 bytes
Access Times (typical reads, including settling)	Random DVD	< 140 ms (typical)
	Random CD	< 125 ms, (typical)
	Full Stroke DVD	< 250 ms (seek)
	Full Stroke CD	< 210 ms (seek)
Maximum Data Transfer Rates	CD-R write	7200 KB/s (48X) Max
	CD-RW write	1500 KB/s (10X) Max
	CD-ROM, CD-R, CD-RW read	7200 KB/s (48X) Max
	DVD ROM read	21,632 KB/s (16X) Max

Technical Specifications – Optical Storage

48X Combo CD-RW/DVD-ROM (continued)	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s); ATA UltraDMA mode 1 (24 MB/s), mode 2 (33 MB/s); ATA UltraDMA Mode 3 44 Mbytes/s (default)
	Cache Buffer	2 MB (minimum)
	Startup Time (single)	< 7 seconds (typical)
	Startup Time (multi-session)	< 30 seconds (typical)
	Stop Time	< 4 seconds
Power	Source	Four-pin, DC power receptacle
	DC Power Requirement	5 VDC \pm 5%—100 mV ripple p-p
		12 VDC \pm 5%—200 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
		12 VDC (< 600 mA typical, < 1400 mA maximum)
Total Drive Power (standby mode)	< 2.5 Watt	
Audio Output Level	0.7 Vrms (typical)	
Configuration Jumper Block	Master, slave, and cable select modes	
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
Environmental (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
	Relative humidity (operating)	10% to 90%
	Maximum wet bulb temperature (operating)	86° F (30° C)
Certifications, Requirements	MPC-3 compliant, multi-read requirements, ACA AS/NZS 3548, ANSI C63.4-1992, ATAPI Spec SFF-8020, ATA Spec X3T9.2, CB Bulletin No. 92A, CSA C22.2 No. 950-1995, C.I.S.P.R. Pub 22, EMKO-TSE 207/94, TUV or VDE EN60 950, EN60825-1, Microsoft PC2001 certification, Microsoft Logo for Windows XP, 2000, and NT4	
Operating Systems Supported	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	

Technical Specifications – Optical Storage

4X DVD+R/+RW Drive	Recording Method	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet		
	Interface	ATAPI ATA/ATAPI-5 and SFF-8090 Version 5		
	Disc Recording Capacity	4.7 GB		
	Write Support	DVD+R, DVD+RW, CD-R, CD-RW		
	Read Support	DVD-ROM (single- and dual-layer), DVD+R, DVD+RW, DVD-R, DVD-RW, CD-ROM Mode 1, CD-ROM XA (Mode 2, forms 1 and 2), CD TEXT, Photo CD single- and multi-session), CD-DA (Audio CD), CD-Extra, CD-R, CD-RW (supports AM2)		
	Write Speed	DVD+R	4X CLV (5400 KB/s)	
		DVD+RW	2.4X CLV (3250 KB/s)	
		CD-R	16X CLV (2400 KB/s)	
		CD-RW	10X CLV (1500 KB/s)	
	Read Speed	DVD-ROM (single)	12X CAV (6750 - 16200 KB/s)	
		DVD-ROM (dual)	7X CAV (4050 - 9450 KB/s)	
		DVD+R, DVD+RW, DVD-R, DVD-RW	5X CAV (2700 - 6750 KB/s)	
		CD-ROM, CD-R	40X CAV (2550 to 6000 KB/s)	
		CD-RW	32X CAV (1950 to 4800 KB/s)	
		CD-Audio	32X CAV (1950 to 4800 KB/s)	
	Data Buffer	Read	2 MB	
		Write	2 MB	
	Access Time (random average)	DVD-ROM — 140 ms CD-ROM — 125 ms (CD-ROM Mode 1 disc are used)		
	Data Transfer Rates	2400 Kbytes/sec. (maximum) to CD-R media 1500 Kbytes/sec. (maximum) to CD-RW media		
	System Configuration	Intel Pentium III Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data		
	Operating Systems Support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home		
	Mounting Orientation	Horizontal and vertical		
	Power Requirement	5 V, +12 V (1.6A, 1.4A)		
Size	8.0 x 5.9 x 1.7 in (20.3 x 15.0 x 4.4 cm)			
Front Panel Features	Disc loading tray, forced eject hole read/write indicator, eject button			
Rear Panel Features	ATAPI interface, digital audio output 1, analog audio output, device configuration jumper, DC input DC Power Connector, 4 pin; Line Out Connector, 4 pin; IDE Bus Connector, 40 pin; Configuration Jumper Pins; Label to identify each connector			
Regulatory Approvals	UL, CSA, CB Report, FIMKO, SEMKO, FCC Class B, FDA, CE Marking, C-Tick, CISPR-229, Korean EMC, Taiwan EMC			

Technical Specifications – Removable Storage

1.44-MB Diskette Drive	LED Indicators (front panel)	3.5 in.
	Read/Write Capacity per diskette (high/low density)	Green
	Drive Supported	1.44 MB/720 KB
	Drive Height	One
	Drive Rotation	One-third
	Transfer Rate (high/low)	300 rpm
	Bytes/Sector	500/250 Kb/s
	Sectors/Track (high/low)	512
	Tracks/Side (high/low)	18/9
	Access Times	80/80
		Track-to-Track (high/low)
	Average (high/low)	169/94 ms
	Settling Time	15 ms
	Latency Average	100 ms

USB Drive Key	Dimensions (HxWxD)	0.9 x 0.6 x 3.2 inches(2.3 x 1.5 x 8.2 cm)
	Weight	0.05 pounds (0.02 kg)
	USB Specification	1.1
	Transfer Rate	Read-1023 KB/Sec; Write-850 KB/Sec
	Storage Media	Solid state flash memory, no moving parts
	Power Supply	USB Bus-powered, no external power required
	Capacity	64MB and 128MB

Zip 250 Drive	Interface	ATAPI IDE	
	Media format supported	Zip disk	
	Media capacity	250 MB	
	Access time	29 ms (average)	
	Drive rotational speed	2,941 rpm	
	Size	Fits into a 5.25-inch bay (with bracket)	
	Data transfer rate	Maximum sustained	2.4 Mbps
			1.4 Mbps
			1.4 Mbps (100 MB), 2.4 MB/s (250 MB)
			0.3 Mbps (100 MB), 2.4 MB/s (250 MB)
Operating conditions	Temperature	50° to 125° F (10° to 51.5° C)	
	Humidity	20% to 80%	
	Compatible operating system	Microsoft Windows 2000 and Windows NT 4.0	

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