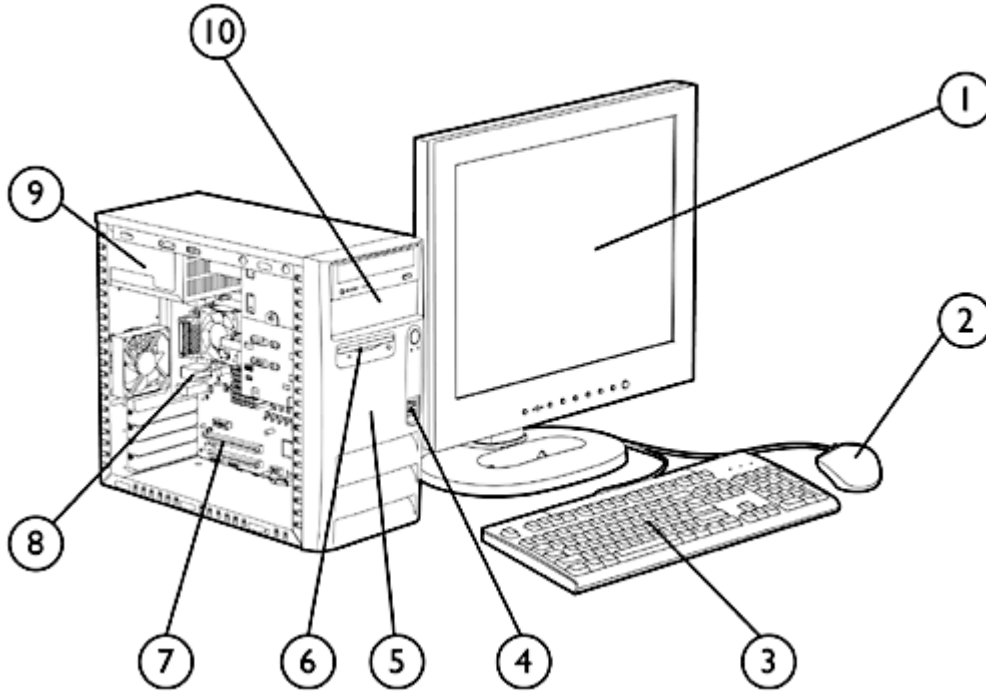


HP recommends Microsoft®  
Windows® XP Professional

#### Microtower

14.49 x 6.89 x 15.75 in (368 x 175 x 400 mm – H x W x D)



- 1. Monitor (sold separately)
- 2. 2-Button Scroll Mouse
- 3. HP Standard Keyboard
- 4. Front I/O – 2 USB 2.0 ports & Mic-in, Headset
- 5. 2 internal 3.5" bays (2nd HDD expandable via 2nd HDD bracket option)
- 6. One external 3.5" bay for optional diskette drive or other 3.5" device
- 7. 2 full-height PCI 2.3 slots, 1 PCI-Ex1 slot for dx2060  
2 full-height PCI2 .3 slots, 1 PCI-Ex1, 1 PCI-Ex1 6 for dx2180
- 8. 4 USB 2.0 ports, 1 serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, 1 audio in, 1 audio out, 1 MIC
- 9. 230-watt max power supply
- 10. 2 external 5.25" bays for optional optical drives

## Overview

### At A Glance

- Intel® Pentium® 4 and Celeron® D LGA775 processors
  - Choice of operating systems:
    - Genuine Microsoft Windows XP 32-bit Home – Cost Reduced (China Only)
    - Genuine Microsoft Windows XP 32-bit Professional – Cost Reduced (China Only)
    - Genuine Microsoft Windows XP 32-bit Home SP2
    - Genuine Microsoft Windows XP 32-bit Professional SP2
    - FreeDos
  - Intel 915GV Express chipset for dx2060, 915G Express chipset for dx2180
  - Intel Integrated Graphic Media Accelerator 900
  - PCI Express I/O bus
  - Integrated 10/100 Network Connection
  - Integrated SATA/150 controller for Serial ATA Hard Drives
  - Integrated Ultra ATA/100 controller for choice of optical drives
  - Single or Dual channel DDR2 SDRAM system memory
  - Integrated audio
  - Energy Star /CCEC compliant with energy-saving features
  - Protected by HP Services, including a 1-1-1 or 3-1-1 standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.
  - Choice of PCI-Ex16 Graphics cards for dx2180
- 

### What's New

- Intel 915GV chipset ( dx2060 – 915GV)
  - Intel 915G chipset (dx2180 – 915G)
  - Choice of operating systems:
    - Genuine Microsoft Windows XP 32-bit Home - Cost Reduced (China Only)
    - Genuine Microsoft Windows XP 32-bit Professional - Cost Reduced (China Only)
    - Genuine Microsoft Windows XP 32-bit Home SP2
    - Genuine Microsoft Windows XP 32-bit Professional SP2
  - Integrated 10/100 Network Connection
  - PC2-4200 (533MHz) DDR2 SDRAM
  - Single or Dual Channel memory configurations
  - System ROHS/CCEC compliance
-

## Available Technology and Features

### Processors (EM64T)

#### Intel Celeron D Processors:

Intel Celeron D 326 Processor (2.53-GHz, 256K L2 cache, 533-MHz FSB)  
Intel Celeron D 331 Processor (2.66-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 336 Processor (2.80-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 341 Processor (2.93-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 346 Processor (3.06-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 351 Processor (3.20-GHz, 256KB L2 cache, 533-MHz FSB)

#### Intel Pentium 4 Processors:

506 – 2.66-GHz, 1-MB L2 cache, 533-MHz FSB  
516 – 2.93-GHz, 1-MB L2 cache, 533-MHz FSB  
519K – 3.06-GHz, 1-MB L2 cache, 533-MHz FSB

#### Intel Pentium 4 Processors supporting Hyper-Threading Technology:

521 – 2.80-GHz, 1-MB L2 cache, 800-MHz FSB  
531 – 3.0-GHz, 1-MB L2 cache, 800-MHz FSB  
541 – 3.20-GHz, 1-MB L2 cache, 800-MHz FSB  
551 – 3.40-GHz, 1-MB L2 cache, 800-MHz FSB  
630 – 3.00-GHz, 2-MB L2 cache, 800-MHz FSB  
640 – 3.20-GHz, 2-MB L2 cache, 800-MHz FSB  
650 – 3.40-GHz, 2-MB L2 cache, 800-MHz FSB

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### Operating Systems and FreeDos

#### Application Software

Genuine Microsoft Windows XP Home SP2  
Genuine Microsoft Windows XP Professional SP2  
Genuine Microsoft Windows XP Home SP2 – Cost Reduced (China Only)  
Genuine Microsoft Windows XP Professional SP2 – Cost Reduced (China Only)  
Genuine Microsoft Office 2003 Basic (India and SEAT Only)  
Genuine Microsoft Office 2003 Small Business (India and SEAT Only)  
Genuine Microsoft Office 2003 Professional (India and SEAT Only)  
Adobe Acrobat Reader  
Norton Anti-Virus 2005  
Raxio Cineplayer  
Dantz Restrospect Express 7 (Drop in Box)  
Lightscribe driver (Drop in Box)  
Roxio DigitalMedia Plus (Drop in Box)  
Roxio DigitalMedia Plus (Non – DVD playback) (Drop in Box)  
Redhat Linux (Drop in Box – India)  
SCO Unix (For China Only)  
Altiris Local Recovery  
Sun Java Runtime Environment

### Available Technology and Features

Hard Drives	40-GB Serial ATA 1.5-Gb/s Hard drive (7200 rpm)
	80-GB Serial ATA 3.0-Gb/s Hard drive (7200 rpm)
	160-GB Serial ATA 3.0-Gb/s Hard drive (7200 rpm)
	250-GB Serial ATA 3.0-Gb/s Hard drive (7200 rpm)
<b>NOTE:</b> The Serial ATA interfaces in the HP Compaq dx2060/dx2180 Microtower support data transfer rates up to 1.5 Gb/s.	

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System Memory – Single Channel Configurations	256-MB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (1 x 256-MB)
	512-MB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (1 x 512-MB)
	1-GB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (1 x 1-GB)

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System Memory - Dual Channel Configurations	512-MB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (2 x 256-MB)
	1-GB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (2 x 512-MB)
	2-GB DDR SDRAM PC2-4200 (533-MHz) Non-ECC (2 x 1-GB)
<b>NOTE:</b> For best performance, memory speeds and sizes should not be mixed. See memory section for more information.	

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Removable Storage	1.44MB diskette drive
	512MB USB HP Drive Key II (USB 2.0)

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Optical Storage	48X CD-ROM drive
	52X CD-ROM drive
	48X/32X/48X CD-RW drive
	16X/48X DVD-ROM drive
	48X/32X Combo CD-RW/DVD-ROM Drive
	16X DVD+/-RW Lightscribe Drive (Double Layer/Dual Format)

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Keyboard	HP PS/2 Standard Keyboard
	HP USB Standard Keyboard

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Mouse	HP PS/2 2-Button scroll mouse
	HP USB 2-Button scroll mouse
	HP USB 2-Button optical scroll mouse

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Audio	Realtek ALC653 2-channel audio
	3D audio compliant with AC'97 rev. 2.3

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## Available Technology and Features

Communication      Integrated Realtek 8100C 10/100 Network Connection  
Broadcom Netxtreme Gigabit Ethernet PCI Express x1 Adapter  
Agere 56K PCI Soft Modem

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Graphics              Intel integrated GMA900 (integrated with the 915GV/915G chipset) – dx2060/dx2180  
nVidia Geforce 6200 TC 64MB w/DVH, VGA, TVout PClex16 – dx2180  
nVidia Geforce 6600 128MB w/DVH, VGA, TVout PClex16 – dx2180  
ATI Radeon x300SE 128MB PClex16 – dx2180

## System Details

Base Unit	<ul style="list-style-type: none"> <li>• uATX microtower chassis, including power supply and front bezel; featuring five (5) drive bays (2nd HDD via additional bracket) and four PCI expansion slots(Chassis structure from back)</li> <li>• Microsoft or Linux operating system CD (Varies depending upon countries)</li> <li>• Active type heatsink</li> <li>• 90 x 90 x 25mm chassis fan</li> <li>• Motherboard with Intel 915GV/915G chipset, Realtek 10/100 integrated network interface, integrated graphics and audio, 2 PCI slots, 1 PCI Express x1 slot, 2 DDR2 DIMM memory slots (1 additional PCI Express x 16 for dx2180)</li> <li>• (1) IDE data cable – (3) headed; supports two Optical drives</li> <li>• (1/2) SATA data cables – Base on required HDD qty</li> <li>• Product documentation on CD</li> <li>• HP system restore CD</li> <li>• Power cord</li> </ul>
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Slots	PCI 2.3	Two (2) full-height slots on PCA
	Memory Expansion	Two (2) DIMM slots (2.0GB maximum memory support)
	PClex1	One (1) PClex1 slots on PCA
	PClex16	One (1) PClex1 slots on PCA (dx2180 only)

Bays	Internal	Two (2) 3.50" half-height (default -1, 2nd HDD expansion available as option)
	External	Two (2) 5.25" half-height One (1) 3.50" half-height

USB Support	EHCI high-speed USB 2.0 controller Two (2) front ports; Four (4) rear ports
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Interfaces (Legacy)	<ul style="list-style-type: none"> <li>One (1) parallel port</li> <li>One (1) serial port</li> <li>One (1) PS/2 keyboard port</li> <li>One (1) PS/2 mouse port</li> <li>One (1) analog VGA video port</li> <li>One (1) line in; one (1) line out; one (1) mic in</li> <li>One (1) RJ45 network port</li> </ul>
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Weight & Dimensions	Chassis Dimensions	14.49 x 6.89 x 15.75 in (368 x 175 x 400 mm) (H x W x D)
	Packaged Dimensions	21.85 x 19.72 x 15.83 in (555 x 501 x 402 mm) (L x W x H)
	System Weight	18.48 lb (8.4 kg)
	Shipping Weight	26.62 lb (12.1 kg)

## System Details

Supported Technology & Memory Type Features

- PC2-4200 DDR2 SDRAM (533MHz) non-ECC
- Single or dual channel configurations
- 2.0GB maximum system memory
- Serial ATA 1.5-Gb/s and 3.0-Gb/s hard drives are supported
- 915GV/915G chipset limits throughput to 1.5 Gb/s

Hard Drive Interfaces Supported

Intel Pentium 4 Processor without HT Technology Coprocessor CPU Socket Type/Number

Integrated  
Socket T  
LGA775 socket

CPU Package

LGA775

Front Side Bus Speed

533-MHz

Cache Memory

1-MB L2 Advanced Transfer Cache (500 Series)

Intel Pentium 4 Processor with HT Technology Coprocessor CPU Socket Type/Number

Integrated  
Socket T  
LGA775 socket

CPU Package

LGA 775

Front Side Bus Speed

800-MHz

Cache Memory

1-MB L2 Advanced Transfer Cache (500 Series)  
2-MB L2 Advanced Transfer Cache (600 Series)

Intel Celeron D CPU Coprocessor CPU Socket Type/Number

Integrated  
Socket T  
LGA775 socket

CPU Package

LGA 775

Front Side Bus Speed

533-MHz

Cache Memory

256-KB L2 Advanced Transfer Cache

## System Details

Chassis	Front Panel	<ul style="list-style-type: none"> <li>• Power button</li> <li>• Power On LED</li> <li>• HDD Activity LED</li> </ul>
	Cooling Solutions Supported	<ul style="list-style-type: none"> <li>• Power Supply Fan (with speed control)</li> <li>• Active heat sink (variable speed)</li> <li>• Chassis fan (variable speed)</li> </ul>
	Slots Supported	Two (2) full-height, half-length PCI slots One (1) PCIe1 Slot One (1) PCIe16 slot (dx2180 only)
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard uATX I/O connectors, including four (4) USB 2.0 ports
	Drive Bays	<ul style="list-style-type: none"> <li>• Two (2) 5-1/4" external</li> <li>• One (1) 3-1/2" external</li> <li>• Two (2) 3-1/2" internal (2nd expansion via option)</li> </ul>
	Other	Hook for Padlock
	Power Supply	<ul style="list-style-type: none"> <li>• 230 watt ATX Power Supply – PFC with 230V only/ non-PCF with a 115v/230v line switch (varies by country/region)</li> </ul>

## Unit Environment and Operating Conditions

### General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

Temperature Range	Operating Temperature: 50° to 95° F (10° to 35° C) Non-operating Temperature: -22° to 140° F (-30° to 60° C)
Relative Humidity	Operating Humidity 10% to 90% (non condensing at ambient) Non-operating Humidity 5% to 95% (non condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 8,000 ft (2500 m) Non-operating: 30,000 ft (9000 m)

NOTE: Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

## Motherboard

Socket mPGA478B industry standard uATX form factor

- Processor
- Socket T; LGA 775
  - Support single Intel Pentium 4/Celeron 800/533MHz FSB processors





## System Details

PWM	<ul style="list-style-type: none"> <li>• ON 3 phase power solution</li> <li>• Meet Intel FMB 04A spec</li> </ul>
Chipset	<ul style="list-style-type: none"> <li>• Intel 915GV Express</li> <li>• Intel ICH6</li> </ul>
Super I/O	<ul style="list-style-type: none"> <li>• ITE IT8712</li> </ul>
Front Side Bus Frequency	<ul style="list-style-type: none"> <li>• 533/800-MHz</li> </ul>
Memory	<ul style="list-style-type: none"> <li>• 2 x DIMM sockets</li> <li>• Support single and dual channel</li> <li>• PC2-4200 DDR2 SDRAM</li> </ul>
Clock Generator	<ul style="list-style-type: none"> <li>• IDT CK410/ICS954119</li> </ul>
Integrated Graphics	<ul style="list-style-type: none"> <li>• Intel GMA900 (integrated on the 915GV/915G chipset)</li> </ul>
Audio	<ul style="list-style-type: none"> <li>• Realtek ALC653 2 channel audio</li> <li>• 3D audio compliant with AC'97 rev. 2.3</li> </ul>
LAN	<ul style="list-style-type: none"> <li>• Realtek 8100C 10/100 LAN</li> </ul>
IDE	<ul style="list-style-type: none"> <li>• Support all PIO modes</li> <li>• 1xIDE port support up to 2 Optical devices</li> <li>• Support Ultra ATA 33/66/100</li> </ul>
Expansion Slots	<ul style="list-style-type: none"> <li>• 2 x PCI 2.3 slots</li> <li>• 1 - PClex1 slot</li> <li>• 1 - PClex16 slot (dx2180 only)</li> </ul>
BIOS	<ul style="list-style-type: none"> <li>• 4Mbit flash EEPROM</li> <li>• Award BIOS, PnP, ACPI, SMBIOS 2.4, Boot Block, DMI</li> </ul>
Manageability	<ul style="list-style-type: none"> <li>• WfM 2.0, DMI 2.0, SMBus</li> </ul>
Industrial Standard	<ul style="list-style-type: none"> <li>• PCI 2.3 compliant</li> <li>• USB 2.0</li> </ul>
Rear Side I/O Ports	<ul style="list-style-type: none"> <li>• 1 x PS/2 keyboard port</li> <li>• 1 x PS/2 mouse port</li> <li>• 4 x USB 2.0 ports</li> <li>• 1 x RJ-45 10/100 port</li> <li>• 1 x serial port</li> <li>• 1 x parallel port</li> <li>• 1 x DB 15 pin analog VGA port</li> <li>• 3 x audio ports</li> </ul>
On Board I/O Interfaces	<ul style="list-style-type: none"> <li>• 1 x ATX power connector</li> <li>• 1x+12V power connector</li> <li>• 1 x Floppy connector</li> <li>• 1 x Front panel connector, Switch, LED (Power/HDD)</li> <li>• 2 x Fan headers for CPU, chassis, with voltage/fan speed control</li> <li>• 1 x ATAPI headers-CD IN</li> <li>• 1 x header to support 2 USB 2.0 ports at front side</li> <li>• 1 x IDE connector (Optical drive)</li> <li>• 2 x SATA connectors</li> <li>• 1 x audio header ( mic in/audio out)</li> </ul>

## System Details

- |                     |  |
|---------------------|--|
| Board Size          | <ul style="list-style-type: none"> <li>• uATX form factor, PCB size: 9.6 x 9.0 in</li> <li>• 4-layer PCB with green color</li> </ul>   |
| Additional Features | <ul style="list-style-type: none"> <li>• Keyboard/mouse/USB/Lan wake up</li> <li>• Support S1, S3, S4 and S5</li> <li>• ACPI status</li> <li>• Hardware monitor capability</li> <li>• CPU fan speed control</li> </ul> |

- |              |   |
|--------------|---|
| Power Supply | <ul style="list-style-type: none"> <li>• ATX Power Supply – Passive PFC at 230V only/non-PFC with a 115v/230V line switch</li> <li>• Passive Power Factor Correction (PFC) – with voltage set to 230V</li> <li>• 50-60 Hz rated line frequency</li> <li>• 230 watt maximum rated power</li> </ul> |
|--------------|---|

- |                                      |  |
|--------------------------------------|--|
| Power Conservation<br>'Energy Saver' | <ul style="list-style-type: none"> <li>• Energy Star compliant</li> <li>• APM 1.2 support</li> <li>• Screen blanking</li> <li>• Hard drive 'Idle' mode</li> <li>• System Idle mode</li> <li>• CCEC - China Only (&lt;3 w in S5 – power off)</li> <li>• &lt;4 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC)</li> <li>• Processor/Cache memory power-down (S3)</li> </ul> |
|--------------------------------------|--|

- |                               |  |
|-------------------------------|--|
| System Environmental<br>Specs | <ul style="list-style-type: none"> <li>• Values are subject to change without notification and are for reference only.</li> <li>• Performance of system, options, and ancillary equipment will vary depending on the system configuration.</li> <li>• Levels presented do not account for non-HP/Compaq installed hardware.</li> </ul> |
|-------------------------------|--|

- |  |           |   |
|--|-----------|---|
| Ambient Air Temperature <sup>Operating</sup> |           | 10° to 35°C at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8,000 ft (2500m), no direct sustained sunlight. Maximum rate of change is 25°C/Hr. The upper limit may be limited by the type and number of options installed. |
|  | Storage   | -30° to 60°C –<br>Maximum rate of change: 210°C/Hr.   |
| Humidity                                     | Operating | 10% to 90% relative humidity (Rh), 30°C maximum wet bulb temperature, non-condensing  |
|  | Storage   | 10% to 95% relative humidity (Rh), 38.7°C maximum wet bulb temperature, non-condensing  |
| Altitude                                     | Operating | 0 to 8,000 feet (0 to 2438.4 meters) – This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8 m/min).   |

## System Details

	Non-Operating	0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min).
Shock		Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during an 2~3 ms half-sine shock pulse
	Non-Operating	35G's (Half-sine Shock) 35G's (Trapezoidal Shock)
Vibration		Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range.
	Operating	Random vibration at 5Hz@0.00025G <sup>2</sup> /Hz, 10Hz@0.01 G <sup>2</sup> /Hz, 100Hz@0.01G <sup>2</sup> /Hz, 300Hz@0.00001G <sup>2</sup> /Hz 5Hz to 300Hz, (0.25 G's nominal).
	Non-Operating	Random vibration at 0.008G <sup>2</sup> /Hz, 10Hz to 500Hz, (2 Grms nominal).
Acoustic Noise		Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).
	IDLE (Fixed disk drive spinning)	LWAd = 4.3 Bels (goal), <4.5 Bels (must) Desktop Average LpAm = 32 dBA (goals) Desktop Average LpAm < 35 dBA (must)
	FIXED DISK (Random write)	LWAd = 5.5 Bels, Desktop Average LpAm = 40 dBA
	CD-ROM (Sequential Reads)	LWAd = 5.5 Bels, Deskside Average LpAm = 44 dBA

**Service and Support** On-site Warranty<sup>1</sup> This 1-1-1 or 3-1-1 limited warranty delivers on-site, next business-day<sup>2</sup> service for parts and labor and includes free telephone support<sup>3</sup> Global coverage 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. One-year onsite and labor are not available in all countries.

**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 Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

## After-Market Options

Communication	Modems	
	Agere PCI Hi-Speed 56K International SoftModem	EK694AA
	Wireless Network Interface Cards	
	Wireless A+G PCI Adapter – WW except Americas	PZ928AA
	Network Interface Cards	
	Broadcom NetXtreme Gigabit Ethernet PCI Express x1	EA833AA
	Intel Pro/1000 PT Gb Ethernet PCI Adapter	EH352AA
Hard Disk Drives	80-GB 7200 rpm SATA 3.0Gb/s Hard Drive	PY276AA
	160-GB 7200 rpm SATA 3.0Gb/s Hard Drive	PY277AA
	250-GB 7200 rpm SATA 3.0Gb/s Hard Drive	PY278AA
Removable Storage Devices	Diskette Drive	
	1.44 MB Diskette Drive (external)	DC141B
	USB Drive Keys	
	512-MB HP Drive Key II (USB 2.0)	ED516AA
	256-MB HP Drive Key II (USB 2.0)	PH657R
Input Devices	Keyboards	
	HP PS/2 Standard Keyboard	DT527A#xxx
	HPUSB Standard Keyboard	DT528A#xxx
	Mice	
	HP PS/2 2-Button Scroll Mouse	DD440B
	HP USB scroll Mouse	DD441B
	HP USB 2-Button Optical Scroll Mouse	DC172B
Memory	PC4200 (533MHz) DDR2 SDRAM non-ECC	
	256-MB DDR2 SDRAM PC4200 (533-MHz) non-ECC	PV558AA
	512-MB DDR2 SDRAM PC4200 (533-MHz) non-ECC	PV560AA
	1- GB DDR2 SDRAM PC4200 (533-MHz) non-ECC	PV557AA
Audio	HP Satellite Speakers	ZD929AA#xxx

## After-Market Options

Optical Drives	48X Max CD-ROM Drive	DC143B
	52X Max CD-ROM (APJ)	AG041AA
	48X/32X/48X CD-RW Drive	DL975B
	48X/32X Combo Drive CD-RW & DVD-ROM	DL976B
	16X/48X DVD-ROM Drive	PR596A
	16X DVD+/-RW Drive Lightscribe Drive (Dual Format, Double Layer Format)	PR595A

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Monitors	HP L1506 Flat Panel Monitor (15" analog only)	PX848AA
	HP L1706 Flat Panel Monitor (17" analog only)	PX849AA
	HP L1906 Flat Panel Monitor (19" analog only)	PX850AA
	HP L1740 Flat Panel Monitor (17" analog only)	PL766AA
	HP L1940 Flat Panel Monitor (19" analog only)	PF803AA
	HP L1955 Flat Panel Monitor (19" analog only)	PH466AA
	HP L2035 Flat Panel Monitor 20" analog only)	P9614A
	HP L2335 Flat Panel Monitor (23" analog only)	P9615A

## Memory

915GV/915G chipset

DDR2 SYNCH DRAM NON-ECC MEMORY

The Intel 915GV/915G Express chipset supports non-ECC DDR2 PC2-4200 (533-MHz) memory. 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.

MAXIMUM MEMORY (SLIM TOWER, DESKTOP, AND MICROTOWER)

Supports up to 2-GB of DDR2 SYNCH DRAM.

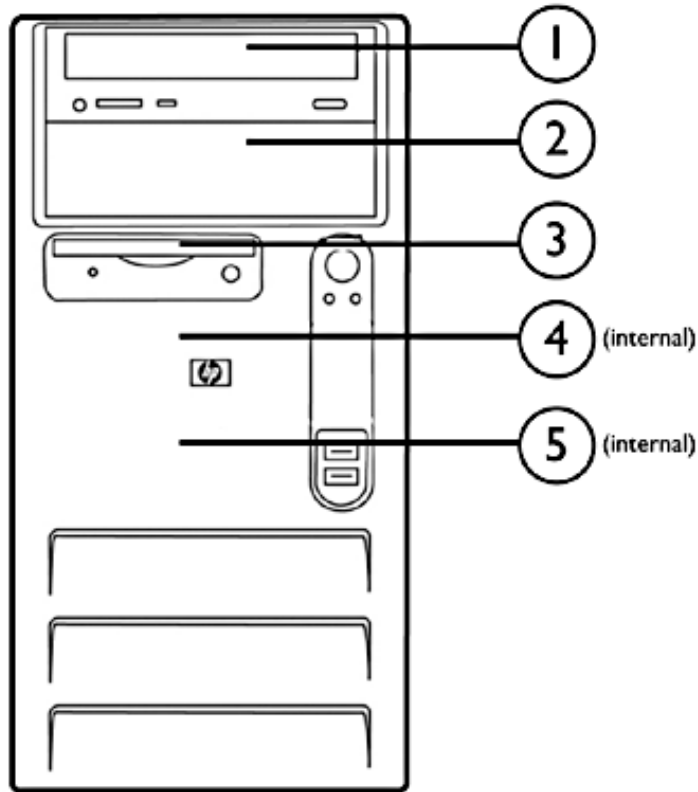
POSSIBLE MEMORY CONFIGURATIONS (SLIM TOWER, DESKTOP, AND MICROTOWER)

NOT ALL MEMORY CONFIGURATIONS POSSIBLE ARE REPRESENTED BELOW.

DIMM Size	Slot			
	Channel A		Channel B	
	1	2	3	4
256-MB	128-MB *		128-MB *	
512-MB	512-MB			
512-MB	256-MB *		256-MB *	
1-GB	512-MB		512-MB	
1-GB	1-GB			
2-GB	1-GB		1-GB	

\* HP recommends dual channel configurations for maximum performance

## Storage



## HP Compaq Business Desktop dx2060/dx2180

Drive Support	Maximum Quantity Supported	Position Supported	Controller
Diskette Drives	1	3	ICH6
CD-ROM Drives	2	1, 2	IDE ATAPI
DVD-ROM Drives	2	1, 2	IDE ATAPI
CD-RW/Combo Drives	2	1, 2	IDE ATAPI
DVD+/-RW Drives	2	1, 2	IDE ATAPI
3.5" Serial ATA Hard Drives	2	4,5	SATA

## Technical Specifications - Audio

Integrated Realtek  
ALC653 Audio

Type	Integrated
AC '97 Stereo Codec	Yes
Sampling	Supports 48 KHz
Power Support	Digital: 3.3V Analog: 5V
Other	Meets performance requirements for audio on PC99/2001 systems High quality differential CD input

**NOTE:** External Speakers need to be powered externally.



## Technical Specifications - Communications

Agere 56K PCI Modem	Data Transmission	56,000 Kbps maximum downstream data <i>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.</i>
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-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis, V.32bis, Bell 212A, and Bell 103	
Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/300 b/s	
Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2	
Error Correction and Data Compression	V.42, 42bis, V.42 and MNP2-5	
Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements	
Upgradeability	Driver upgradeable for 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 158° F (0° to 70° C)	
Operating Humidity	20% to 90%, non-condensing	
Operating System Support	Microsoft Windows 2000 and Microsoft Windows XP	
OS Driver Support	Microsoft Windows 2000 and Microsoft Windows XP	
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 SV92PL – 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 in (17.0 x 5.8 cm) and supports high- and low-profile brackets	
Connection	Single RJ-11 connector	
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support	
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	

## Technical Specifications - Communications

Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Health	Bare PCB material compliant to 94V-0 or better (marked as such)
Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant
Kit Contents	DC132D : Agere Systems PCI International Softmodem with full-height bracket attached, additional low-profile bracket, RJ11 modem cable, driver and documentation CD. <a href="#">NOTE: RJ11 modem adapter is not included.</a> DC131C #xxx: RJ11 modem adapter kit for use with DC132D #ACP: Austria, #ABW: Belgium (Dutch/Flemish), #AKN: Bosnia, Herzegovna, Croatia, Slovenia, Yugoslavia (Slovenian), #AKB: Czech Republic (Czech) & Slovakia, #ABF: France, #ABD: Germany, #ABZ: Greece, #AKC: Hungary, #ABT: Israel, #ABZ: Italy, #ABH: Netherlands, #UUV: Nordic Region, #ACB: Russia, #ACQ: South Africa, #ACD: Switzerland, #AB8: Turkey, #ABU: UK, #ABG: Australia, New Zealand, #ACJ: India.

Broadcom NetXtreme Gigabit Ethernet PCI Express x1 Adapter	Connector	RJ-45
	Controller	Broadcom 5751 PCI-Express LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E
	Data path width	Single channel, PCI-E
	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	3.1 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	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 (full-duplex) 2000 Mbps
	Environmental	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
Dimensions	4.4 x 2.2 x 0.08 in (11.2 x 5.5 x 2 cm)	

## Technical Specifications - Communications

Operating system drive support Microsoft Windows XP

Management capabilities ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility

Alerting N/A

Kit contents Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI-E Adapter, drivers, quick install guide, product warranty statement

## Technical Specifications - Graphics

Integrated Intel GMA900/2D Controller	Support is fully compliant with Microsoft standard API such as Direct Draw, GDI/GDI+ and Direct Show
VGA Controller	Integrated
Bus Type	none
RAMDAC	Integrated 400-MHz DAC
Memory	Graphics memory is shared with system memory. Graphics memory usage can vary from 8 – 128MB depending on the amount of system memory installed and system load. 16MB is pre-allocated for graphics use at system boot time. Additional memory is allocated for graphics using Intel's Dynamic Video Memory Technology (DVMT) to balance the optimum amount of memory between graphics and other system use. With a 128MB system, graphics memory usage will be 8MB – 32MB depending on system load. With 256MB or more, graphics memory usage will be 8MB – 128MB depending on system load.
Controller Clock Speed	333 MHz
Overlay Planes	Single Overlay support with 5x3 filtering
Maximum Color Depth	32-bits/pixel
Maximum Vertical Refresh Rate	85 Hz at 2048 x 1536. Varies with mode and configuration. See table below.
Multi-display Support	Dual independent display
Operating Systems	Microsoft Windows XP
Graphics/Video API Support	Microsoft DirectX®9, DirectXVA®, VMR9, GDI/GDI+; OpenGL® 1.4

Resolutions Supported <sup>1</sup>	Resolution	Maximum Refresh Rate (Hz)	
		Analog Monitor (HP 7500)	Digital Monitor
	640 x 480	85	70
	800 x 600	85	70
	1024 x 768	85	70
	1152 x 864	85	70
	1280 x 768	60	70
	1280 x 960	85	70
	1280 x 1024	85	70
	1600 x 900	60	70
	1600 x 1200	85	60
	1920 x 1080	60	–
	1920 x 1200	60	–
	1920 x 1440	75	–
	2048 x 1536	75	–

<sup>1</sup> Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).

NOTE: Other resolutions and refresh rates may be selectable but are not recommended.

## Technical Specifications - Input/Output Devices

HP PS/2 or USB Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
Electrical		Weight	2 lb (0.9 kg) minimum
		Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI - RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC 99 - 2001	Functionally compliant
		Microsoft PC 99 - 2001	Mechanically compliant
Mechanical		Languages	38 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 switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
Environmental		Microsoft PC 99 - 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
		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, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
		Operating system support	Microsoft Windows XP
Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC		
Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS		

## Technical Specifications - Input/Output Devices

HP 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		
Regulatory Approvals	PC98-99	Mechanically compliant		
	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick			

## Technical Specifications - Hard Drives

Serial ATA Hard Drives 40 GB  
(7200 rpm)

Capacity	40,020,664,320 bytes	
Height	1 in (2.6 cm)	
Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
Interface	Serial ATA	
Synchronous Transfer Rate (Maximum)	5 Gb/s	
Buffer	2 MB	
Seek Time (typical reads, Single Track includes controller overhead, including settling)	1.0 ms	
	Average	8.5 ms
	Full-Stroke	18.0 ms
Rotational Speed	7,200 rpm	
Logical Blocks	78,165,360	
Operating Temperature	32° to 140° F (0° to 60° C)	

80 GB\*

Capacity	80,026,361,856 bytes	
Height	1 in (2.6 cm)	
Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
Interface	Serial ATA	
Synchronous Transfer Rate (Maximum)	5 Gb/s	
Buffer	8 MB	
Seek Time (typical reads, Single Track includes controller overhead, including settling)	1.0 ms	
	Average	8.5 ms
	Full-Stroke	18.0 ms
Rotational Speed	7,200 rpm	
Logical Blocks	156,301,488	
Operating Temperature	32° to 140° F (0° to 60° C)	

160 GB\*

Capacity	160,041,885,696 bytes	
Height	1 in (2.6 cm)	
Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
Interface	Serial ATA	
Synchronous Transfer Rate (Maximum)	5 Gb/s	
Buffer	8 MB	

## Technical Specifications - Hard Drives

	Seek Time (typical reads, Single Track includes controller overhead, including settling)	1.0 ms
	Average	8.5 ms
	Full-Stroke	18 ms
	Rotational Speed	7,200 rpm
	Logical Blocks	312,581,808
	Operating Temperature	32° to 140° F (0° to 60° C)
250 GB*	Capacity	250,059,350,016 bytes
	Height	1 in (2.6 cm)
	Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)
	Interface	Serial ATA
	Synchronous Transfer Rate (Maximum)	3.0 Gb/s
	Buffer	8 MB
	Seek Time (typical reads, Single Track includes controller overhead, including settling)	0.8 ms
	Average	<9.0 ms
	Full-Stroke	<17 ms
	Rotational Speed	7,200 rpm
	Logical Blocks	488,397,168
	Operating Temperature	41° to 131°F (5° to 55°C)

NOTE: \* Although this drive is rated for a 3.0-Gb/s transfer rate, the Serial ATA interfaces in the HP Compaq dx2060/dx2180 Microtower support data transfer rates up to 1.5 Gb/s.



## Technical Specifications - Optical Storage

48X CD-ROM Drive	Interface	ATAPI	
	Data Transfer Rate	Variable (Audio CD) - 1,800 to 3,600 KB/s (24X) Max	Variable (CD-ROM, CD-R)-2,400 to 7,200 KB/s (48x) Max
	Access Time (ms)	Random: <125 ms	Full-stroke seek: <210 ms
	Data Buffer	2MB	
	Disk Formats Read	CD-ROM Mode 1, CD-ROM XA (Mode 2, Form 1 and 2), CD Digital Audio, CD-EXTRA, CD-I (Mode 2, Form 1 and 2) and CD-I Ready, CD-Text, CD-Bridge, Photo CD (Single and Multi Session), Video CD, CD-R and CD-RW Multi-Session	
	Disk Formats Written	None	
	Disk Capacity (CD)	180MB, 540MB, 650 MB, and 700MB	
	Block Size	Mode 1-2,048, 2,352 bytes Mode 2-1, 2,048, 2,328, 2,336, 2,340, 2,353 bytes Mode 2-2, 2,328, 2,336, 2,340, 2,352 bytes CD-DA-2,352, 2,368 bytes	
	Diameter	12 cm; 8 cm	
	Thickness	1.2 mm	
	Track Pitch	1.6 $\mu$ 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 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
	Dimensions (H x W x D, maximum)	1.7 x 5.9 x 8.0 in (4.3 x 15.0 x 20.3 cm)	
	Weight	2.6 lb (1200 g)	
	Operating Systems Supported	Microsoft Windows XP	

48X/32X/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 (20.3 x 14.93 x 4.34 cm)
	Weight	2.6 lb (1.2 kg)
	Disc diameter	12 cm, 8 cm
	Disc thickness	1.2 mm
	Track pitch	1.6 $\mu$ m
	Disc center hole diameter	5 mm

## Technical Specifications - Optical Storage

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
	Disc type	CD-R and CD-RW
Writeable disc parameters	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	CD-RW write	4800 KB/s (up to 32X)
	CD-ROM, CD-R read	7200 KB/s (up to 48X)
	CD-RW read	7200 KB/s (up to 32X)
	CD-R write	7200 KB/s (up to 48X)
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	

## Technical Specifications - Optical Storage

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 VCD < 1A (typical) < 1600 mA (maximum) 12 VCD < 600 mA (typical) < 1.4A (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)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 90%
	Maximum Wet Bulb Temperature (operating)	84° F (29° C)
Certifications, requirements	ACA AS/NZS 3548, ANSI C63.4-1992, CB Test Certificate for IEC 950, CE Mark, CFR 47 part 15, CNS 13438, CSA C22.2 No. 60950, DHHS/FDA - 1040, EN60825, EN55022:1998, EN55024, EN60950:2000, ICES-003 class B, IEC 61000 4-2 - 4-11, Nordic EN60 950, TUV or VDE EN60 950, UL 60950, C.I.S.P.R. Publication 22 Class B, BSMI, Microsoft® P2001, Microsoft Logo for Windows® 98, 2000 and XP	
Operating systems supported	Microsoft Windows XP	

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16X/40X DVD-ROM	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

## Technical Specifications - Optical Storage

		(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	40 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 (typical)
	CD-ROM Mode 1	90 ms (typical)
	Full Stroke DVD	240 ms (seek) (typical)
	Full Stroke CD	160 ms (seek) (typical)
Maximum Data Transfer Rates	CD-ROM Read	6000 KB/s (40X) Max
	DVD-ROM Read	21,600 KB/s (16X) Max
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 90%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)
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 XP	
Kit Contents	16X/40X DVD-ROM Drive, Roxio CinePlayer software, and installation guide.	

48X/32X/48X/16X      Height      5.25-inch, half-height, tray-load



## Technical Specifications - Optical Storage

Combo CD-RW/DVD-ROM	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 (14.66 x 4.34 x 18.69 cm) (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		

## Technical Specifications - Optical Storage

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)
Data transfer rates	CD-R write	7200 KB/s (up to 48X)
	CD-RW write	1500 KB/s (10X) Max
	CD-ROM, CD-R, CD-RW read	7200 KB/s (up to 48X)
	DVD ROM read	21,632 KB/s (16X) Max
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	
Operating Conditions (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 XP Professional, Windows XP Home	

## Technical Specifications - Optical Storage

16X DVD+/-RW Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	ATAPI/EIDE	
	Disc recording capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
Write speed	DVD+R	Up to 16X	
	DVD+RW	Up to 4X	
	DVD+R DL	Up to 2.4X	
	DVD-R	Up to 8X	
	DVD-RW	Up to 4X	
	CD-R	Up to 40X	
	CD-RW	Up to 24X	
	Read speed	DVD+R/-R/+RW/-RW	Up to 16X
		DVD-ROM	Up to 16X
		CD-R/RW	Up to 40X
Access time (typical reads, including settling)	Random	DVD: < 130 ms (typical), CD: < 120 ms (typical)	
	Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)	
	Startup Time	Single-session: < 7 seconds (typical), Multi-session: < 30 seconds (typical)	
	Stop Time	< 4 seconds	
	Cache Buffer	2 MB (minimum)	
Data Transfer Modes		ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
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	Line-Out	0.7 VRMS	
	Signal-to-Noise Ratio	74 dB	
	Channel Separation	65 dB	

## Technical Specifications - Optical Storage

Environmental conditions (operating - non-condensing)	Temperature Relative humidity Maximum wet bulb temperature	41° to 122° F (5° to 50° C) 10% to 90% 86° F (30° C)
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 supported	Microsoft Windows 2000 and Windows XP	
Regulatory approvals	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft PC2001 certification, Microsoft Logo for Windows XP and 2000.	
Option kit contents	16X DVD+/-RW drive, Roxio DigitalMedia Plus, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media.	



## Technical Specifications - Removable Storage

1.44-MB Diskette Drive Size	3.5 in (8.89 cm)	
LED Indicators (front panel)	Green	
Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
Drive Height	Onethird	
Drive Rotation	300 rpm	
Transfer Rate (high/low)	500/250 KB/s	
Bytes/Sector	512	
Sectors/Track (high/low)	18/9	
Tracks/Side (high/low)	80/80	
Access Times	Track-to-Track (high/low)	3/6 ms
	Average (high/low)	94/173 ms
	Settling Time	15 ms
Cylinders (high/low)	Latency Average	100 ms
	80/80	
Read/Write Heads	Two	

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