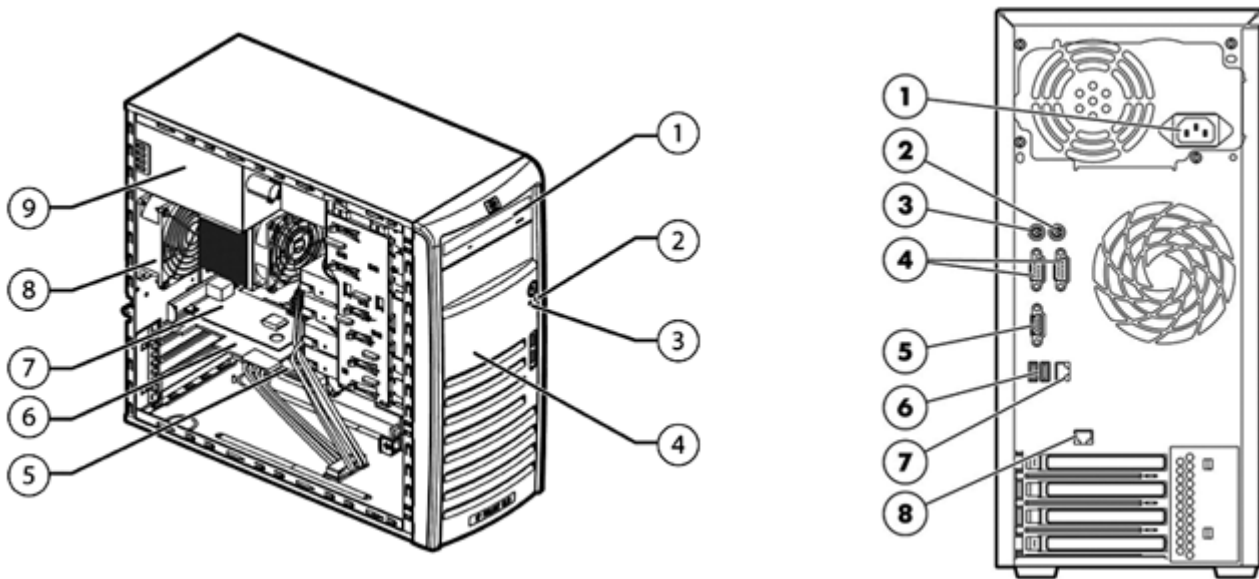


Overview



Front View:

1. CD-ROM Drive
2. Power LED
3. Drive Activity LED
4. Well ventilated chassis design
5. Main System Board
6. HDD controller card (Optional)
7. HP LO 100c Management Card (Optional)
8. Rear System Fan
9. 370W Power Supply

Rear View:

1. Power Supply Outlet
2. S/2 Mouse Port
3. PS/2 Keyboard Port
4. Serial Ports A,B
5. VGA Port
6. Rear USB 2.0 Ports
7. LAN Port (RJ-45)
8. HP Lights-Out 100 Remote Management Card Port

What's New

- Processors:
 - Dual-Core Intel® Pentium D Processor 935 (3.2 GHz, 800 MHz FSB)
 - Dual-Core Intel® Pentium D Processor 945 (3.4 GHz, 800 MHz FSB)
- Storage Controller:
 - HP SC44Ge Host Bus Adapter
- Communications:
 - HP NC110T PCI Express Gigabit Server Adapter
- Internal Storage:
 - Support up to 1.2TB SAS max storage (4 x 300 GB)

Overview

At A Glance

- **Processor:**
 - Dual-Core Intel® Xeon® processors 3000 sequence
 - Dual-Core Intel® Pentium® D processors 800 or 900 sequence
 - Single-Core Intel® Celeron® D processors
- **Memory**
 - 512 MB Standard / 8 GB Maximum of PC2-5300 DDR2 667 MHz ECC unbuffered Memory
- **Storage Controller:**
 - 4 Port SATA controller with Embedded RAID on Motherboard
 - HP 8 Internal Port SAS HBA with RAID
- **Internal Drive Support:**
 - 4 HDD Support:
 - 2TB SATA max storage (utilizing 500GB CTO HDD)
 - 1.2TB SAS max storage (4 x 300GB)
- **Network Controller:**
 - Embedded NC320i PCIe Gigabit Server Adapter
- **Expansion Slots:**
 - Two 32-bit/33MHz PCI at 3.3V slot
 - Two PCI-Express slots (x4 and x8, both in an x8 connector).
- **USB Ports:**
 - Six total USB ports (2 internal, 2 front, 2 rear)
- **Form Factor:**
 - Micro ATX tower
- **Management:**
 - Standard IPMI reporting
 - Lights Out 100c Remote Management Card (Optional)
- **Warranty:**
 - Protected by HP Services and a worldwide network of HP Authorized Channel Partners, including a one-year, limited warranty, Next Business Day 1, year on-site limited Global warranty. Certain restrictions and exclusions apply. SATA hard drives have a one year warranty

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: <http://h71028.www7.hp.com/ERC/downloads/4AA0-7780ENW.pdf>

Processor One of the following depending on Model	Dual-Core Intel® Pentium® D Processor 945 (3.4 GHz, 800 MHz FSB)* Dual-Core Intel® Pentium® D Processor 935 (3.2 GHz, 800 MHz FSB)* Dual-Core Intel® Pentium® D processor 925 (3.0 GHz, 800MHz, FSB) Dual-Core Intel® Pentium® D processor 915 (2.8 GHz, 800MHz FSB) Dual-Core Intel® Pentium® D processor 820 (2.8 GHz, 800MHz FSB)* Dual-Core Intel® Xeon® processor 3050 (2.13 GHz, 1066MHz FSB)* Dual-Core Intel® Xeon® processor 3040 (1.86 GHz, 1066MHz FSB) Single-Core Intel® Celeron® D processor 352 (3.20 GHz, 533MHz FSB)*
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*Available through Configure To Order only. See Factory Integration Models section for more details.

Cache Memory One of the following depending on Model	1x2 MB shared Level 2 cache (Xeon sequence) 2x2 MB Level 2 cache (Pentium D 900 sequence) 2x1 MB Level 2 cache (Pentium D 800 sequence) 512KB Level 2 cache (Celeron D)
--	--

Chipset	Intel 3000
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Memory Protection	ECC
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Memory	Type	PC2-5300 unbuffered DDR2 SDRAM (667MHz)
	Standard	512 MB
	Maximum	8 GB

Network Controller	Embedded NC320i PCIe Gigabit Server Adapter
---------------------------	---

Expansion Slots	Slot Number	Bus Speed	Hot Plug Y/N	PCI Voltage	Notes
	4	x8 PCI Express	No	n/a	Full Height
	3	x4 PCI Express	No	n/a	In a x8 slot Full Height
	1/2	32bit/33MHz PCI	No	3.3V	Full Height

NOTE: Only one brace for full length cards provided.

Storage Controller One of the following depending on Model	Integrated 4 port SATA controller with embedded RAID
--	--

Standard Features

Storage	CD-ROM	48x IDE (ATAPI) CD-ROM Drive	
	Hard Drives	SATA	160GB SATA 7200 rpm Drive
		SAS	72GB SAS 15,000 rpm Drive
Maximum Internal Storage	Type		
	SAS (Not-hot plug)	1.2TB	(4x300GB)
	SATA (Non-hot plug)	2TB	(4 x 500GB*)
*Available through Configure To Order only. See Factory Integration Models section for more details.			
Interfaces	Parallel	0	
	Serial	2	
	Pointing Device (Mouse, PS2)	1	
	Graphics	1	
	Keyboard (PS2)	1	
	USB	6 total (2 rear, 2 front panel, 2 internal (one for USB Tape connectivity))	
			<p>NOTE: Internal USB ports are optimal for the attachment of HP USB DAT Tape Drives</p> <p>NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html</p>
	Network RJ-45 (Ethernet) Management	1	Optional Lights-Out 100c Remote Management port
Graphics	Integrated 2MB video controller		
Form Factor	Micro ATX Tower (4U)		
Industry Standard Compliance	ACPI V2.0 Compliant		
	PCI 2.3 Compliant		
	PXE Support		
	WOL Support		
	IPMI 2.0 compliance		
Manageability	Embedded IPMI standard reporting Optional HP ProLiant Lights-Out 100c Remote Management Card		

Standard Features

Security	Power-on password Setup password
Server Power Cords	12' lowline NEMA power cord. NOTE: Rack models ship standard with a 12' IEC cable. Most redundant power supply options ship with a 6' power cord.
Power Supply	370 Watts
System Fans	1 – non-redundant system fan shipped standard 1 – non-redundant CPU heatsink fan shipped standard
OS Support	Microsoft Windows Server 2003: Standard & Enterprise Edition (32 and 64 bit) Microsoft Windows Small Business Server 2003 Microsoft Windows 2003 Server, Web Edition Microsoft Windows Server 2008 Novell NetWare 6.5 SBS (only after SP6 release) RedHat Enterprise Linux SUSE Linux Enterprise Server NOTE: For an up-to-date listing of the latest ML110 G4 OS support matrix, please see: http://www.hp.com/go/supportos NOTE: For an up-to-date listing of the latest software and drivers available for your server, please select your server: http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&cc=us&taskId=135&prodTypeId=15351&prodCatId=241435 NOTE: Drivers may also found on the base media for some Linux OS's. When configuring your server, please consult your base media driver base, or visit HP.com at: http://h18023.www1.hp.com/support/files/server/us/index.html NOTE: For more Linux OS support & certification information, please visit our the ProLiant & Bladesystem Server Linux matrix: http://h18004.www1.hp.com/products/servers/linux/hpLinuxcert.html NOTE: When installing a Windows OS Environment and configuring the embedded SATA RAID, AHCI, or SAS controllers, installation of a driver from a diskette device is required. The optional USB floppy drive (part number DC361B) is required on the ML110 G4 to accomplish this operation. NOTE: Netware 6.5 SP6 is not supported with the embedded SATA RAID.

Standard Features

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and/or storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers, as well as, the MSA1000, VA7xx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to <http://www.hp.com/go/factory-express>.

HP Enterprise Configurator

The HP eCo-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

HP Care Pack Services provide total care and support expertise with committed response designed to meet your IT and business needs.

HP Care Pack services include coverage for the HP branded hardware options qualified for the server that are purchased at the same time or afterward and internal to the enclosure. It also includes the 22" and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

To fully capitalize on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - Simplify ProLiant solution implementation, maintenance and management.

- Support Service - 3 Year, 9x5 Next Business Day coverage, excluding HP holidays only
- Deployment Service - Hardware Installation only

Enhanced Service - Optimize service level to increase IT performance and availability

Standard Features

- Support Service - 3 Year 13x5 Same Business Day, 4-Hour response coverage
- Deployment Service - Installation and Start-up only

Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays.

For a complete listing of service offerings and information visit:

<http://www.hp.com/services/proliantservices>

<http://www.hp.com/go/proliant/carepack>

Models

SATA Models

HP ML110G4 P925
512MB, NHP 160GB
SATA (1P)
440288-001

Processor(s) One of the following depending on Model	One (1) Dual-Core Intel® Pentium® D Processor 925 (3.0 GHz, 800 MHz FSB)
Cache Memory One of the following depending on Model	2 x 2MB Level 2 cache (Pentium 915 & Pentium 925) 1 x 2MB shared Level 2 cache (Xeon 3040)
Memory	512 MB PC2-5300 ECC (DDR2-667Mhz) (1 x 512 MB)
Storage Controller	HP Embedded 4 Port SATA Controller with embedded RAID
Hard Drive	160GB SATA HDD
Internal Storage	Maximum 1TB (4 x 250GB) SATA
Optical Drive	48x CD-ROM
Form Factor	Micro ATX Tower

SAS Models

HP ML110G4 3040,
512MB, NHP-SAS (1P)
432126-001

Processor(s) One of the following depending on Model	One (1) Dual-Core Intel® Xeon® 3040 Processor (1.86 GHz, 1066 MHz FSB)
Cache Memory	1 x 2MB shared Level 2 cache (Xeon 3040)
Memory	512 MB PC2-5300 ECC (DDR2-667Mhz) (1 x 512 MB)
Storage Controller	HP 8 Internal Port SAS HBA with RAID (0,1)
Hard Drive	72GB SAS HDD
Internal Storage	Maximum 1.2TB (4 x 300GB) SAS
Optical Drive	48x CD-ROM
Form Factor	Micro ATX Tower

Configuration Information-Factory Integrated Models

NOTE: HP does not allow factory integration of options into standard models listed above.

Configure-to-order servers must start with a CTO Chassis.

NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.

NOTE: FIO indicates that this option is a Factory Installable Option.

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

Step 1: Base Configuration

Models	HP ProLiant ML110 G4 Tower Chassis	417710-B21
	Factory Integrated Models ship with:	
	Embedded NC320i PCIe Gigabit Server Adapter	
	Keyboard and Mouse	
	370 Watts, PFC (Power Factor Correcting)	
	Tower Form Factor (4U)	

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processors	Single-Core Intel® Celeron® D processor 352 3.20 GHz/533MHz/512 MB L2 Cache, Factory Integrated	430934-L21
	Dual-Core Intel® Pentium® D processor 925 3.0 GHz/800MHz/2x2 MB L2 Cache, Factory Integrated	433357-L21
	Dual-Core Intel® Pentium® D Processor 935 3.2 GHz/800 MHz, 2x2 MB L2 Cache, Factory Integrated	440284-L21
	Dual-Core Intel® Pentium® D Processor 945 3.4 GHz/800 MHz/2x2 MB L2 Cache, Factory Integrated	440285-L21
	Dual-Core Intel® Xeon® processor 3040 1.86 GHz/1066MHz/1x2M L2 Cache, Factory Integrated	432125-L21
	Dual-Core Intel® Xeon® processor 3050 2.13 GHz/1066MHz/1x2M L2 Cache, Factory Integrated	430936-L21

Memory	2 GB Unbuffered PC2-5300 ECC DIMM (1 x 2 GB)	432806-B21
	1 GB Unbuffered PC2-5300 ECC DIMM (1 x 1 GB)	432804-B21
	512 MB Unbuffered PC2-5300 ECC DIMM (1 x 512 MB)	432803-B21

Configuration Information-Factory Integrated Models

Hard Drives	Serial ATA (SATA) – Non-hot Plug HDD (SATA or SAS Models)	
	HP 80GB 1.5G SATA 7.2K NHP 3.5" HDD	383410-B21
	HP 160GB 1.5G SATA 7.2K NHP 3.5" HDD	411275-B21
	HP 250GB 1.5G SATA 7.2K NHP 3.5" HDD	411276-B21
	HP 500GB 1.5G SATA 7.2K NHP 3.5" HDD, FIO*	404469-B21
	* Factory Integrated Only	
	Serial Attached SCSI (SAS) Non-Hot Plug (SAS Models Only)	
	HP 300GB SAS 3.5" 15K NHP	431950-B21
	HP 146GB SAS 3.5" 15K NHP	432093-B21
	HP 72GB SAS 3.5" 15K NHP	432095-B21

Optical Drives	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP DVD+R/RW 8X HH	383974-B21
	HP ProLiant 48X CD	398972-B21
	DVD ROM Drive 16x	217053-B21
	NOTE: For the installation of Windows and other OS's, a floppy drive (DC361B) may be required to complete driver installation. A USB drive key may not work to complete driver installation.	

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Options" section below.

NOTE: Some options may not be factory integratable. Please contact your local sales representative for additional information.

Operating Systems	Pre-install Microsoft Windows 2003 SBS Standard Edition	
	MS W2003 SBS R2 Std 1XX FIO Eng SW	432564-001
	MS W2003 SBS R2 Prm 1XX FIO Eng SW	432566-001

Options

Memory	2 GB Unbuffered PC2-5300 ECC DIMM (1 x 2 GB)	432806-B21
	1 GB Unbuffered PC2-5300 ECC DIMM (1 x 1 GB)	432804-B21
	512 MB Unbuffered PC2-5300 ECC DIMM (1 x 512 MB)	432803-B21

Smart Buy Memory	1024 MB Unbuffered Advanced ECC PC2-5300 DDR2 (1x1024 MB), Dual Rank	432804-S21
	512 MB Unbuffered Advanced ECC PC2-5300 DDR2 (1x512 MB), Single Rank	432803-S21

Optical Drives	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	48X CD-ROM Option, Carbon	398972-B21
	DVD-RW Drive Option Kit	383974-B21
	1.44 MB USB Diskette Drive	DC361B

NOTE: For the installation of Windows and other OS's, a floppy drive may be required to complete driver installation. A USB drive key may not work to complete driver installation.

Hard Drives	Serial – ATA (SATA) – Non-Hot Plug (SATA Models Only)	
	HP 80GB 1.5G SATA 7.2K NHP 3.5" HDD	383410-B21
	HP 160GB 1.5G SATA 7.2K NHP 3.5" HDD	411275-B21
	HP 250GB 1.5G SATA 7.2K NHP 3.5" HDD	411276-B21

NOTE: When purchasing systems with the 500GB Non-Hot Plug SATA drives, please reference the Configuration Information Section of this QuickSpecs to order via Configuration to Order.

NOTE: The purchase of additional SATA hard drives requires the purchase of additional HP 1-Port SATA RAID Cables, (P/N 413748-B21)

Hard Drives	Serial Attached SCSI (SAS) Non-Hot Plug (SAS Models Only)	
	HP 300GB SAS 3.5" 15K NHP	431950-B21
	HP 146GB SAS 3.5" 15K NHP	432093-B21
	HP 72GB SAS 3.5" 15K NHP	432095-B21

NOTE: The purchase of SAS hard drives requires the purchase of HP Internal SAS/SATA 4-Port Cable (P/N 430479-B21). This cable is standard in the SAS BTO model.

NOTE: The purchase of SAS HBA or array controller is required.

Options

Storage Controllers	HP SC44Ge Host Bus Adapter	416096-B21
	HP SC11Xe Host Bus Adapter	412911-B21
	HP 8 Internal Port SAS HBA with RAID	347786-B21
	NOTE: PCI-X Interface (PCI 32bit/33MHz compatible)	
	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
	NOTE: PCI-X Interface (PCI 32bit/33MHz compatible)	
	HP Smart Array E200/128 BBWC Controller	411508-B21
	128MB Battery-Backed Write Cache Enabler	351580-B21
	NOTE: Supports the Smart Array E200 Controller, Smart Array 641 Controller and Smart Array 642 Controller.	
	HP 1-Port SATA RAID Cable	413748-B21
NOTE: The purchase of SATA hard drives requires the purchase of the HP 1-Port SATA RAID Cable (P/N 430479-B21) for each additional hard drive.		
HP Internal SAS/SATA 4-Port Cable	430479-B21	
NOTE: The purchase of a SAS Storage Controller requires the purchase of HP SAS/SATA 4-Port Cable (P/N 430479-B21)		
NOTE: SAS Storage Controllers will run both SATA and SAS drives.		

Communications	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	NOTE: Does not support Windows 2000.	
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	Agere 2006 PCI Hi-Speed 56K Modem	440519-B21

Tape Drives	NOTE: Installation of SCSI internal tape drives in a ML110 G4 model requires SCSI controller kit (PN: 412911-B21).	
	NOTE: For complete listing of tape drive offerings see: http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html	
	USB Tape Drives	
	HP StorageWorks DAT 40 USB Internal Tape Drive (Carbonite)	DW022A
	HP StorageWorks DAT 72 USB Internal Tape Drive (Carbonite)	DW026A
	HP StorageWorks DAT 160 USB Internal Tape Drive	Q1580A
	SAS Tape Drives	
	HP StorageWorks DAT 160 SAS Internal Tape Drive	Q1587A
	DAT SCSI Tape Drives	
	HP StorageWorks DAT 40 SCSI Internal Tape Drive (Carbon)	C5686C
	HP StorageWorks DAT 72 SCSI Internal Tape Drive (Carbon)	Q1522B
	HP StorageWorks DAT 160 SCSI Internal Tape Drive	Q1573A

Options

HP D2D Backup System	HP StorageWorks D2D110 Backup System	EH880A
	NOTE: 1TB of Disk Storage	
	HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit	EH923A
	NOTE: 1TB of Disk Storage	
	HP StorageWorks D2D120 Backup System	EH884A
	NOTE: 2TB of Disk Storage	
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit	EH924A
	NOTE: 2TB of Disk Storage	
HP StorageWorks D2D130 Backup System	EH950A	
NOTE: 3TB of Disk Storage.		
HP StorageWorks D2D130 Backup System with Data Protector Express Software Kit	EH951A	
NOTE: 3TB of Disk Storage.		
HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape Drive	EH952A	
NOTE: 3TB of Disk Storage.		
NOTE: Please see the HP D2D Backup Systems QuickSpecs for additional information:		
http://h18000.www1.hp.com/products/quickspecs/12651_na/12651_na.HTML		

Installation of Server into Racks	ProLiant Rack Enabling Kit	417705-B21
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Lights Out Management Card	Lights-Out Management Card Kit for ML110 G4	418280-B21
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UPS	HP T1000 UPS	AF404A
	HP T1000 UPS	AF403A
	HP T750 UPS, Low Voltage	378439-D71

USB Options	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA
	USB 2.0 4-port HUB	DG954A

HP KVM Switch Options	HP 1x4 Console Switch	AF611A
	HP PS2 Server Console Cable, 6 foot, 2-Pack	AF612A
	HP USB Server Console Cable, 6 foot, 2-Pack	AF613A
	NOTE: required for supporting USB peripherals.	
	NOTE: For additional information regarding KVM Switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm .	

Service and Support, HP Care Pack, and Warranty Information

Service and Support Offerings (HP Care Pack Services)	Hardware Services 4-Hour On-site Service	
	13-Hour x 5-Day Coverage, 3 Years	U4434E
	24-Hour x 7-Day Coverage, 3 Years	U4435E
	Hardware Services Next Business Day On-Site Service	
	9-Hour x 5-Day Coverage, 3 Years	U4433E
	Hardware Services 6 Hour Call-to-Repair	
24-Hour x 7-Day Coverage, 3 Years, 6 Hour Call-to-Repair	U4436E	
Hardware Installation Service		
HP Install ProLiant ML110 Service	U4444E	
NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack .		

Memory

HP ProLiant ML110 G4 Models

Standard Memory

512 MB of PC2-5300 DDR2 SDRAM running at 512 MB with ECC capabilities Memory installed (1 x 512 MB SDRAM DIMM).

Standard Memory Plus Optional Memory

Up to 5120 MB memory is available with the optional installation of PC2-5300 un-buffered ECC DDR2 SDRAM DIMM Memory kits.

Standard Memory Replaced with Optional Memory

Up to 8192 MB of memory is available with the removal of the standard 512 MB of memory and the optional installation of PC2-5300 un-buffered ECC DDR2 SDRAM DIMM Memory kits.

NOTE: The below chart does not represent all possible memory configurations.

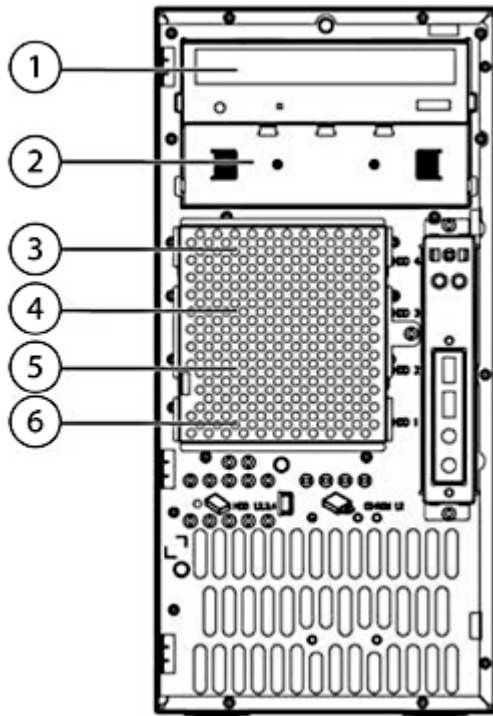
NOTE: In memory configurations requiring 2 DIMM and 4 DIMM configurations, the memory must be paired for optimal performance. This means that DIMMs in slot 1 and 3 have to be identical, in slot 2 and 4 have to be identical. (For example, the Optional memory configuration shown below)

Memory		Slot			
		4	3	2	1
Standard	512 MB	Empty	Empty	Empty	512 MB
Optional	5120 MB	2048 MB	512 MB	2048 MB	512 MB
Maximum	8192 MB	2048 MB	2048 MB	2048 MB	2048 MB

Following are memory options available from HP:

2 GB Unbuffered PC2-5300 ECC DIMM (1 x 2 GB)	432806-B21
1 GB Unbuffered PC2-5300 ECC DIMM (1 x 1 GB)	432804-B21
512 MB Unbuffered PC2-5300 ECC DIMM (1 x 512 MB)	432803-B21

Storage



- 1 48x IDE (ATAPI) CD-ROM
- 2 Removable Media Bays (1.6" each)
- 3, 4, 5, Four (4) Non-Hot Plug Drive Bays
- 6

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
DVD + CDRW Drive	2	1 or 2	Integrated IDE (ATAPI)
DVD-RW Drive	2	1 or 2	Integrated IDE (ATAPI)

Hard Drives (SATA Models only)

SATA 1.5Gb – Non-Hot Plug

	Quantity Supported	Position Supported	Controller
3.5-inch 80GB 7.2K, SATA 160GB 7.2K, SATA 250GB 7.2K SATA 500GB 7.2K SATA	Up to 4	3,4,5,6	4 Port SATA controller with Embedded RAID on Motherboard

Storage

Hard Drives (SAS Models only)

SAS – Non-Hot Plug

	Quantity Supported	Position Supported	Controller
3.5-inch	Up to 4	3,4,5,6	HP 8 Internal Port SAS HBA with RAID (0,1)
72GB 15K SAS			
145GB 15K SAS			
300GB 15K SAS			

Maximum Storage Capacity – SATA/SAS Models

Internal	SATA	1TB (4x250GB (BTO) 2TB (4 x 500GB (CTO))
	SAS	1.2TB (4x300GB)
Total	SATA	1TB (4x250GB (BTO) 2TB (4 x 500GB (CTO))
	SAS	1.2TB (4x300GB)

Tape Drives and D2D Backup System

NOTE: A SCSI controller needs to be purchased to operate internal SCSI devices in the SATA Models.

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following:
http://h18000.www1.hp.com/products/quickspecs/North_America/10233.html

	Position Supported	Controller	Controller/HBA Option Kit Part Number
Internal USB Tape Drives	2	USB 2.0 port	N/A
DAT 24 USB			
DAT 40 USB			
DAT 72 USB			
External USB Tape Drives	External	USB 2.0 port	N/A
DAT 40 USB			
DAT 72 USB			
DAT160 USB			
Internal SAS Tape Drives	2	HP SC44Ge Host Bus Adapter	416096-B21
DAT 160 SAS			
External SAS Tape Drives	External	HP SC44Ge Host Bus Adapter	416096-B21
DAT 160 SAS			
Internal SCSI Tape Drives	2	HP SC11Xe Host Bus Adapter	412911-B21
DAT 40			
DAT 72			
DAT160			
External SCSI Tape Drives	External	HP SC11Xe Host Bus Adapter	412911-B21
DAT 40			
DAT 72			
DAT160			

Storage

HP StorageWorks D2D Backup Systems D2D110 D2D120	External	Embedded Network Controller	N/A
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Power Specifications

Part Number	416121-001
Spare Kit	419029-001
Operational Input Voltage Range (Vrms)	100 to 127 and 200 to 240 V auto ranging
Frequency Range (Nominal) (Hz)	50 to 60 Hz

Nominal Input Voltage (Vrms)	100	115	208	220	230	240
Max Rated Output Wattage Rating	N/A	370	N/A	N/A	370	N/A
Nominal Input Current (A rms)	N/A	8	N/A	N/A	4	N/A
Max Rated Input Wattage Rating (Watts)	N/A	N/A	N/A	N/A	N/A	N/A
Max. Rated VA (Volt-Amp)	N/A	N/A	N/A	N/A	N/A	N/A
Efficiency (%)	N/A	>65%	N/A	N/A	>65%	N/A
Power Factor	N/A	N/A	N/A	N/A	N/A	N/A
Leakage Current (mA)	0.25mA (at 60HZ)	N/A	N/A	N/A	N/A	N/A
Maximum Inrush Current (A peak)	N/A	No component was damaged and input fuse shall not blow	N/A	N/A	No component was damaged and input fuse shall not blow	N/A
Maximum Inrush Current duration (mS)	N/A	N/A	N/A	N/A	N/A	N/A

System Specifications

	Power **
HP ProLiant ML110 G4 Fully Configured	(see **)
Fully Loaded System output Wattage (W)	370W
Fully Loaded System Input Current (A rms)	8A @ 115V, 4A @ 230V
Fully Loaded System Thermal (BTU- Hr)	1907BTU
Fully Loaded System VA (Volt-Amp)	920
System Leakage with all power supplies loaded (mA)	0.75mA@240V 0.45mA@120V
System Inrush Current with all power supplies loaded (A)	80A
Power cord requirements	Nema 5-15P to IEC320-C13
	IEC320-C13 to IEC320-C14
**Power shown is for a fully configured system consisting of (1) CPU, (4) double-sided DIMMs, (4) HDDs, (1) CD-ROM, (1) DVD-ROM, (4) PCI cards, and (1) power supply.	
Power Cords (13 Cord Sets)	Power Cord Part Number
	121565-001

Technical Specifications

System Unit	Dimensions (HxWxD) (with feet)	14.46 x 6.88 x 16.76 in (36.7 x 17.5 x 42.6 cm)
	Weight (approximate)	23.15 lb (10.5 kg)
	Input Requirements (per power supply)	Range Input Voltage 100 to 127 VAC/200 to 240 VAC Normal Line Voltage 115 or 230 VAC
	Line Frequency	50 to 60 Hz
	Rated Input Current	load 8A at 115VAC, 4A at 230VAC
	BTU Rating	1907 BTU
	SCSI Connectors (SCSI Models only)	One internal LVD/SE connector for U160 devices, plus two internal SE connectors for legacy devices.
	Power Supply Output Power (per power supply)	Rated Steady-State Power 370W Maximum Peak Power 370W
	Temperature Range	Operating 50° to 95° F (10° to 35° C) Shipping -40° to 140° F (-40° to 60° C)
	Relative Humidity (non-condensing)	Operating 10% to 90% Non-operating 10% to 90%
	Acoustic Noise	Idle (Fixed Disk Drives Spinning) L WAd (BELS) 5.5 Operating (Random Seeks to Fixed Disks) L WAd (BELS) 6.0

HP 160GB 1.5G SATA 7.2K NHP 3.5" HDD 411275-B21	160GB 7,200 rpm	Capacity	160,041 MB
		Height	1.0 in. (26.1 mm)
		Width	4.0 in. (101.6 mm)
		Interface	Serial ATA
		Transfer rate synchronous (maximum)	1.5 Gb/s
		Seek time (typical reads, including settling)	Single track 0.9 ms Average 9.0 ms Full-stroke 17.8 ms
			Rotational speed 7,200 rpm
		Physical Configuration	Bytes/Sector 512 Logical Blocks 312,581,808
		Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications

NHP 72GB 3G SAS 15K 72GB 15K
3.5" HDD
431950-B21

Capacity	73,407,856,856	
Height	1.0 in (25.4mm)	
Width	4.0 in. (101.6 mm)	
Interface	SAS	
Transfer rate synchronous (maximum)	3 Gb/sec	
Seek time (typical reads, including settling)	Single track	0.27 ms
	Average	3.5 ms
	Full-stroke	3.5 ms
	Rotational speed	15,000 rpm
Physical Configuration	Bytes/Sector	512
	Logical Blocks	143,374,737
Operating Temperature	50° to 95° F (10° to 35° C)	

48X Max IDE (ATAPI) CD- Disk
ROM Drive
398972-B21

Applicable Disk	CD-ROM, CD-XA, CD-DA (Mode 1, Mode 2, Form 1 and 2) Photo CD (Single and Multi-session) Mixed Mode (Audio and Data combined) CD-R	
Capacity	540MB (Mode 1, 12 cm) 650MB (Mode 2, 12 cm)	
Block Size	Mode 1	2,048 bytes, 1024 bytes
	Mode 2	2,340 bytes, 2,336 bytes, 1024 bytes
	CD-DA	2,352 bytes
	CD-XA	2,328 bytes
Interface	IDE (ATAPI)	
Access Times (typical)	Random	<100 ms
	Full-Stroke	<150 ms
Data Transfer Rate	Sustained	3000 to 7200 KB/s (20X to 48X)
	Burst	150 KBps to 7,200 KBps
	Bus Rate	16.7 MBps
Cache Buffer	128 KB	
Start-up Time (typical)	< 7 seconds	
Stop Time	< 4 seconds	
Laser Parameters	Type	Semiconductor Laser GaAlAs
	Wave Length	780 ± 25 nm
Operating Conditions	Temperature	41° to 122° F (5° to 50° C)
	Humidity	10% to 90%
Dimensions	(HxWxD, maximum)	1.63 x 5.75 x 7.87 in (41.3 x 146 x 200 cm)
	Weight	2.64 lb (1.2 kg)

Technical Specifications

4 port Embedded SATA controller	SATA Protocol	SATA 1.5Gb/s		
	SATA Ports	4 internal		
	Port transfer rate	1.5 Gb/s total		
	Maximum Capacity	up to 2 TB (4 x 500GB non hot plug SATA HDD)		
	RAID Levels Supported	RAID 1+0 (Striping & Mirroring) RAID 1 (Mirroring) RAID 0 (Striping)		
Logical RAID Volumes Supported				
Embedded NC320i PCIe Gigabit Server Adapter	Network Interface	10Base-T/100Base-TX/1000Base-TX		
	Compatibility	IEEE 802.3 10Base-T		
		IEEE 802.3ab 1000Base-T		
		IEEE 802.3u 100Base-TX		
	Data Transfer Method	Single lane (x1), 100MHz PCI Express Reference Clock		
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s	
		10Base-T (Full-Duplex)	20 Mb/s	
		100Base-TX (Half-Duplex)	100 Mb/s	
		100Base-TX (Full-Duplex)	200 Mb/s	
		1000Base-TX (Half and Full-Duplex)	2000Mb/s	
Connector	RJ-45 connector			
Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)		
	10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)		
Environment-friendly Products and Approach	End-of-life Management and Recycling	<p>Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p>		

Technical Specifications

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.