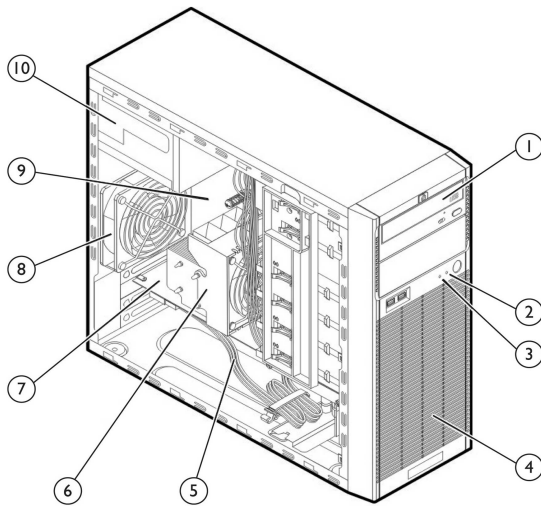
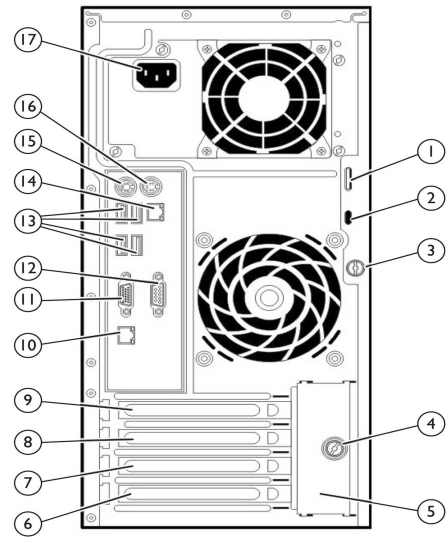


Overview



Front View:

1. DVD-ROM Drive
2. Power LED
3. Drive Activity LED
4. Front Bezel
5. SAS Cable (SAS model only)
6. CPU Heatsink
7. Hard Drive Controller Card (Optional)
8. System Fan
9. System Board
10. 300W Power Supply



Rear View:

1. Kensington lock notch
2. Cable lock provision notch
3. Access panel thumbscrew
4. Expansion slot cover retainer thumb screw
5. Expansion slot cover
6. Expansion slot 1
7. Expansion slot 2
8. Expansion slot 3
9. Expansion slot 4
10. Management NIC port (RJ-45)
11. Video port
12. Serial port
13. USB ports
14. Embedded NIC port (RJ-45)
15. PS/2 keyboard port
16. PS/2 mouse port
17. Power supply cable socket

Overview

At A Glance

- **Processor:**
 - Intel® Xeon® processor X3400 series
 - Intel® 3420 chipset
- **Memory:**
 - Four (4) DIMM slots
 - 2GB (1x2GB) or 4GB (2x2GB) Standard/8GB Maximum, using PC3-10600E DDR3 Unbuffered (UDIMM) ECC memory, operating up to 1333MHz
- **Storage Controller:**
 - Integrated 6 ports SATA controller
 - (4 ports available for hard disks)

NOTE: Transfer rate: 3 Gb/s SATA.
- **Internal Drive Support:**
 - Internal SAS storage capacity of up to 1.8TB (4 x 450GB 3.5" SAS drives)
 - Internal SATA storage capacity of up to 3.0TB (4 x 750GB 3.5" SATA drives)
- **Network Controller:**
 - Embedded NC107i PCI Express Gigabit Ethernet Server Adapter
- **Expansion Slots:**
 - Slot 1: PCI-e Gen 1, x1 (x4 connector) Full-height & Half-length
 - Slot 2: PCI 32-bit/33 MHz at 3.3V Full-height & Full-length
 - Slot 3: PCI-e Gen 1, x4 (x8 connector) Full-height & Full-length
 - Slot 4: PCI-e Gen 2, x16 (x16 connector) Full-height & Full-length
- **USB 2.0 Ports:**
 - Eight (8) USB 2.0 ports: 2 front , 4 rear, 2 internal (one for tape, one for standard USB device)
- **Security - Trusted Platform Module:**
 - One (1) internal TPM 1.2 module connector (Optional)
- **Power Supply:**
 - 300 Watts Non-Hot Plug, Non Redundant Power Supply (80% efficiency)
- **Management:**
 - Standard Lights Out 100 IPMI 2.0 reporting
 - Standard HP ProLiant ML110 G6 Easy Set-up CD
 - Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management
- **Operating System:**
 - Supports Windows including Hyper-V, RHEL and SLES
- **Form Factor:**
 - Micro ATX tower (4U)

NOTE: Rack mounting available via HP Tower to Rack Conversion Tray, Universal Kit. Please see the options section in this QuickSpecs
- **Warranty:**
 - 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 are available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: Server Warranty includes 1 year parts, 1 year labor, 1-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Standard Features

Processor

One of the following
depending on Model

Quad-Core Processors

Intel® Xeon® processor X3460 (2.80GHz, 95W, 8MB, 1333, HT, Turbo 1/1/4/5)

NOTE: Available through Configure To Order only. See Factory Integration Models section for more details.

Intel® Xeon® processor X3450 (2.66GHz, 95W, 8MB, 1333, HT, Turbo 1/1/4/4)

Intel® Xeon® processor X3440 (2.53GHz, 95W, 8MB, 1333, HT, Turbo 1/1/2/3)

NOTE: Available through Configure To Order only. See Factory Integration Models section for more details.

Intel® Xeon® processor X3430 (2.40GHz, 95W, 8MB, 1333, Turbo 1/1/2/3)

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.

NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active.

NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

Cache Memory

Integrated 1x8MB Intel® Smart Cache

NOTE: For more information regarding Intel chipsets, please see the following URL:
<http://www.intel.com/products/server/chipsets/>

Chipset

Intel® 3420 chipset

Memory Protection

ECC

Memory

Type	PC3-10600E unbuffered DDR3 ECC up to 1333MHz
Standard	2GB (1x2GB) or 4GB (2x2GB)
Maximum	8 GB

Network Controller

Embedded NC107i PCI Express Gigabit Ethernet Server Adapter

Standard Features

Expansion Slots #	Technology	Bus Width***	Connector Width	Bus Number*	Device Number**	Form Factor	Notes
1	PCIe	X1	X4	16	0	Full height, half length slot	Gen.1, NHP
2	PCI	32 bit	N/A	48	0	Full height & Full-length slot	33MHz/3.3V, NHP
3	PCIe	X4	X8	32	0	Full height & Full-length slot	Gen.1, NHP
4	PCIe	X16	X16	1	0	Full height & Full-length slot	Gen.2, NHP

*Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number.

** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).

*** Indicates the number of physical electrical lanes running to a PCI-e connector.

Storage Controller Integrated 6 ports SATA controller (4 ports available for Hard Disks)
NOTE: Transfer rate: 3 Gb/s SATA.

Storage

Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive ships standard
Hard Drives	1x250 GB NHP SATA 7200 rpm Drive (Base Model) 2x250 GB NHP SATA 7200 rpm Drive (Performance Model)

Maximum Internal Storage

Non-Hot Plug SAS	1.8TB (4 x 450GB) 3.5" SAS
Non-Hot Plug SATA	3.0TB (4 x 750GB) 3.5" SATA

Interfaces

Parallel	0
Serial	1
Pointing Device (Mouse, PS2)	1
Graphics	1
Keyboard (PS2)	1
USB 2.0 Ports	8 total (4 rear, 2 front panel, 2 internal (one for USB Tape connectivity))

NOTE: 1 Dedicated USB port available for internal USB tape connectivity
NOTE: Please see the following URL for additional information regarding USB support
<http://h18004.www1.hp.com/products/servers/platforms/usb-support.html>

Network RJ-45 (Ethernet)	1 (10/100/1000 bits/s)
Remote Management	HP ProLiant Onboard Administrator (powered by the HP Integrated Lights-Out 100i)

Standard Features

Graphics

64MB shared supporting all display resolutions up to 1600 x 1200 16bpp @ 75Hz
NOTE: 8MB is dedicated to video memory.

Form Factor

Micro ATX Tower (4U)
NOTE: Rack mounting available via HP Tower to Rack Conversion Tray, Universal Kit. Please see the options section in this QuickSpecs.

Embedded Manageability HP ProLiant Onboard Administrator and LO100i Advanced

HP ProLiant Onboard Administrator Powered by LO100i Lights-Out 100 with Optional LO100i Advanced Licenses for Virtual KVM and Virtual Media.

Features:

- Embedded IPMI standard reporting
- System event log access
- Remote Serial console (serial redirection)
- Browser, Telnet access
- SMASH-CLP compliant
- DCMI 1.0 compliant
- IPMI 2.0 compliant
- Secure Socket Layer Encryption
- Secure Shell Encryption
- Virtual media (Floppy, CD, DVD, ISO image, USB 2.0) with Advanced License
- Virtual KVM with Advanced License

NOTE: For more information, please refer to the QuickSpecs for the LO100i found at: www.hp.com/go/lo100

Core Infrastructure Management

HP ProLiant ML110 G6 Easy Set-up CD

The HP ProLiant Easy Set-up CD optimizes single-server setup, providing a simple way to deploy reliable and consistent server configurations. The HP ProLiant 100 Series Easy Set-up CD ships standard with the ML110 G6.

It offers essential single-server deployment tools for HP ProLiant 100 series servers that simplify HP entry server setup, providing a repeatable way to deploy reliable and consistent single-server configurations. The HP ProLiant Easy Set-up CD assists with the OS installation process by preparing the system for installing "off-the-shelf" versions of Windows operating system software and automatically integrating optimized HP ProLiant server software drivers and utilities. Users enjoy the following benefits:

- An easy-to-use, intuitive graphical interface that prepares your system for the OS installation process.
- Integration of key server software drivers with assisted installation.
- Dependency and validity checks to ensure that all supported ProLiant software can be installed.

NOTE: For the latest information about other related software; please visit the HP Insight Control Management Software Portfolio at: <http://h18004.www1.hp.com/products/servers/management/> and the HP

Standard Features

ProLiant Easy Set-up CD Web site at: www.hp.com/servers/easysetup

Industry Standard Compliance

ACPI V3.0a Compliant
PCI 2.3 Compliant
PXE Support
WOL Support
IPMI 2.0 compliance
Microsoft® Logo certifications
Red Hat Enterprise Linux Logo certifications
SUSE Linux Enterprise Server Logo certifications
USB 2.0

Manageability

HP ProLiant Onboard Administrator Powered by HP Integrated Lights-Out 100i with optional LO100i Advanced Licenses for Virtual KVM and Virtual Media.
Embedded Lights Out 100 IPMI 2.0 standard reporting
Standard HP ProLiant ML110 G6 Easy Set-Up CD
Array Configuration Utility (ACU)
Array Diagnostics Utility (ADU)
HP Insight Diagnostics
HP Insight Management Agents and Insight Management Providers for Systems Insight Manager (SIM) Integration

Security

Power-on password
Setup password
Secure Sockets Layer (SSL)
Secure Shell (SSH)

Security - Trusted Platform Module (Optional)

The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline.

NOTE: For more information about TPM, including a white paper, go to: www.hp.com/go/TPM

NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.

NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

Server Power Cords

6' lowline NEMA power cord.

Standard Features

Power Supply	300 Watts Non-Hot Plug, Non redundant Power Supply (80% efficiency)
System Fans	One (1) - Non-redundant system fan shipped standard One (1) - Non-redundant CPU heatsink fan shipped standard
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos and our driver download page http://www.hp.com/support/ML110G6
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 MSAxxx, VA7xxx, 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 eConfigure 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.

Standard Features

Service and Support

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 HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the enclosure, as well as 22" and smaller external monitors and rack mounted UPS options. HP Uninterruptible Power Systems will be covered at the same service level and 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 vendor 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

- **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

Performance model	Processor	(1) Intel® Xeon® processor X3450 (2.66GHz, 95W, 8MB, 1333, HT, Turbo 1/1/4/4)
HP ML110 G6 X3450 NHP SATA Server 506668-001	Cache Memory	8MB Intel® Smart Cache
	Memory	4GB (2x2GB) PC3-10600E DDR3 UB ECC
	Storage Controller	HP Embedded 6 Port SATA Controller (4 ports for HDD)
	Hard Drive	2 x 250GB Non-hot-plug LFF SATA
	Internal Storage	Non-Hot Plug SATA: Maximum 3.0TB (4 x 750GB)
	Power Supply	300W Non-Hot Plug, Non-Redundant Power Supply (80% efficiency)
	Networking	Embedded NC107i PCI Express Gigabit Ethernet Server Adapter
	Management	Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management
	Optical Drive	HP Half-Height 16x SATA DVD-ROM
	Mouse & Keyboard	None ships standard
	Form Factor	Micro ATX Tower (4U)

Base Model	Processor	(1) Intel® Xeon® processor X3430 (2.40GHz, 95W, 8MB, 1333, Turbo 1/1/2/3)
HP ML110 G6 X3430 NHP SATA Server 506667-001	Cache Memory	8MB Intel® Smart Cache
	Memory	2GB (1x2GB) PC3-10600E DDR3 UB ECC
	Storage Controller	HP Embedded 6 Port SATA Controller (4 ports for HDD)
	Hard Drive	1 x 250GB Non-hot-plug LFF SATA
	Internal Storage	Non-Hot Plug SATA: Maximum 3.0TB (4 x 750GB)
	Power Supply	300W Non-Hot Plug, Non-Redundant Power Supply (80% efficiency)
	Networking	Embedded NC107i PCI Express Gigabit Ethernet Server Adapter
	Management	Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management
	Optical Drive	HP Half-Height 16x SATA DVD-ROM
	Mouse & Keyboard	None ships standard
	Form Factor	Micro ATX Tower (4U)

Smart Buys

**HP S-Buy ML110 G6
X3430 NHP SATA Server**
578927-005

Processor	Intel® Xeon® processor X3430 (2.40GHz, 95W, 8MB, 1333, Turbo 1/1/2/3)
Cache Memory	8MB Intel® Smart Cache
Memory	2GB (1x2GB) PC3-10600E DDR3 UB ECC
Storage Controller	HP Embedded 6 Port SATA Controller (4 ports for HDD)
Hard Drive	1 x 160GB Non-hot-plug LFF SATA
Power Supply	300W Non-Hot Plug, Non-Redundant Power Supply (80% efficiency)
Networking	Embedded NC107i PCI Express Gigabit Ethernet Server Adapter
Management	Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management
Optical Drive	HP Half-Height SATA DVD ROM
Mouse & Keyboard	Included
Form Factor	Micro ATX Tower (4U)

**HP S-Buy ML110 G6
X3430 NHP SATA SBS 08
Server**
578928-005

Processor	Intel® Xeon® processor X3430 (2.40GHz, 95W, 8MB, 1333, Turbo 1/1/2/3)
Cache Memory	8MB Intel® Smart Cache
Memory	4GB (2x2GB) PC3-10600E DDR3 UB ECC
Storage Controller	HP Embedded 6 Port SATA Controller (4 ports for HDD)
Hard Drive	2 x 160GB Non-hot-plug LFF SATA
Power Supply	300W Non-Hot Plug, Non-Redundant Power Supply (80% efficiency)
Networking	Embedded NC107i PCI Express Gigabit Ethernet Server Adapter
Management	Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management
Optical Drive	HP Half-Height SATA DVD RW
Operating System	Windows Small Business Server 2008
Mouse & Keyboard	Included
Form Factor	Micro ATX Tower (4U)

**HP S-Buy ML110 G6
X3430 NHP SATA Server**
578929-005

Processor	Intel® Xeon® processor X3440 (2.53GHz, 95W, 8MB, 1333, HT, Turbo 1/1/2/3)
Cache Memory	8MB Intel® Smart Cache
Memory	2GB (1x2GB) PC3-10600E DDR3 UB ECC
Storage Controller	HP Embedded 6 Port SATA Controller (4 ports for HDD)
Hard Drive	1 x 250GB Non-hot-plug LFF SATA
Power Supply	300W Non-Hot Plug, Non-Redundant Power Supply (80% efficiency)
Networking	Embedded NC107i PCI Express Gigabit Ethernet Server Adapter
Management	Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management
Optical Drive	HP Half-Height SATA DVD RW
Mouse & Keyboard	Included
Form Factor	Micro ATX Tower (4U)

Configuration Information-Factory Integrated Models

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 information on CTO product offerings and requirements.

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

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

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

Step 1: Base Configuration

Models	HP ProLiant ML110G6 CTO Chassis	510078-B21
	Factory Integrated Models ship with:	
	Embedded NC107i PCI Express Gigabit Ethernet Server Adapter	
	Integrated HP ProLiant 100 G6 Lights Out 100i Remote Management	
	Embedded SATA controller	
	Easy set up CD	
	PCA	
	Power cord	
	Micro ATX Tower (4U)	

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

Processors	Quad-Core Processor	
	Intel® Xeon® processor X3460 (2.80GHz, 95W, 8MB, 1333, HT, Turbo 1/1/4/5), FIO	578348-L21
	Intel® Xeon® processor X3450 (2.66GHz, 95W, 8MB, 1333, HT, Turbo 1/1/4/4), FIO	578347-L21
	Intel® Xeon® processor X3440 (2.53GHz, 95W, 8MB, 1333, HT, Turbo 1/1/2/3), FIO	578346-L21
	Intel® Xeon® processor X3430 (2.40GHz, 95W, 8MB, 1333, Turbo 1/1/2/3), FIO	578345-L21

Memory	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator .	

Optical Drive	HP Half-Height SATA DVD ROM Kit	447326-B21
	HP Half-Height SATA DVD-RW Optical Kit	447328-B21

Configuration Information-Factory Integrated Models

Hard Drives	SATA Non-Hot Plug 3.5" Midline (MDL) Drives	
	HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
	HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
	HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21
	SATA Non-Hot Plug 3.5" Entry (ETY) Drives	
	HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21
	SAS Non-Hot Plug 3.5" Enterprise (ENT) Drives	
	NOTE: Support for SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.	
	HP 450GB 3G SAS 15K 3.5" DP NHP ENT	454234-B21
	HP 300GB 3G SAS 15K 3.5" DP NHP ENT	417950-B21
	HP 146GB 3G SAS 15K 3.5" DP NHP ENT	417855-B21

Storage Controllers (only required if SAS Non-Hot Plug 3.5" Enterprise Drives are selected)	SAS Controller	
	NOTE: Support for SAS hard drives/tape drive requires selection of a SAS controller.	
	NOTE: Support for RAID levels requires selection of a SAS controller.	
	Smart Array P212 Controller	
	HP P212/256 MB Smart Array Controller FIO Kit	491191-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional "Core Options" and "Additional Options", please refer to the "Options" sections below.

Core Options

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

Memory	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

Optical Drives	HP Half-Height SATA DVD ROM Kit	447326-B21
	HP Half-Height SATA DVD-RW Optical Kit	447328-B21

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and firmware) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SATA Non-Hot Plug 3.5" Midline (MDL) Drives

HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21

SATA Non-Hot Plug 3.5" Entry (ETY) Drives

HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21
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NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html

SAS Non-Hot Plug 3.5" Enterprise (ENT) Drives

NOTE: Support for SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller

HP 450GB 3G SAS 15K 3.5" DP NHP ENT	454234-B21
HP 300GB 3G SAS 15K 3.5" DP NHP ENT	417950-B21
HP 146GB 3G SAS 15K 3.5" DP NHP ENT	417855-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html

Communications

HP NC112T PCI Express Gigabit Server Adapter	503746-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC373T PCI Express Multi-function Gigabit Server Adapter	394791-B21
HP NC382T PCI Express Dual Port Multi-function Gigabit Server Adapter	458492-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

Additional Options

Remote Management	HP LO100i Advanced Pack, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates For additional License Kits please see the Lights-Out 100i QuickSpecs at: www.hp.com/go/lo100 .	530521-B21
Port Option	HP NHP Internal SAS/SATA 4 port cable kit NOTE: SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.	487734-B21
Security	HP Trusted Platform Module Option Kit	488069-B21
Storage Controllers	SAS Controllers NOTE: Support for SAS hard drives/tape drive requires selection of a SAS controller. NOTE: Support for any RAID level requires selection of a SAS controller. Smart Array P212 Controller HP Smart Array P212/Zero Memory Controller 462828-B21 HP Smart Array P212/256MB Controller 462834-B21 Optional Upgrades 256 MB Cache Module 462968-B21 Battery Kit upgrade 462969-B21 NOTE: Required to enable BBWC on the 256MB cache. NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html (Smart Array P212 Controller) SCSI HBA HP SC11Xe U320 Host Bus Adapter 412911-B21 NOTE: Supports SCSI Tapes only, no RAID support. NOTE: HBA is recommended for SCSI tape drive support. NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/12566_na/12566_na.html (SC11Xe HBA)	

Additional Options

Backup & Recovery Software

Data Protector Express

HP Data Protector Express 4.0 SP1 Backup Server BB117BA

HP Data Protector Express 4.0 SP1 for Microsoft Small Business Server BB118BA

HP Data Protector Express Backup Server 4.0 SP1 Upgrade from Data Protector Express Single Server Edition BB117BT

NOTE: Only of these Data Protector Express base products is required. For more information on Data Protector Express and to see available options please visit: <http://www.hp.com/go/dataprotectorexpress>

Tape Storage

Tape Drives

USB Tape Drives

HP StorageWorks DAT 40 USB Internal Tape Drive DW022A

HP StorageWorks DAT 72 USB Internal Tape Drive DW026A

HP StorageWorks DAT 160 USB Internal Tape Drive Q1580A

HP StorageWorks DAT 320 USB Internal Tape Drive AJ825A

SAS Tape Drives

NOTE: Installation of SAS tape drives requires a SAS controller kit (PN: 491191-B21).

HP StorageWorks DAT 160 SAS Internal Tape Drive Q1587A

HP StorageWorks DAT 320 SAS Internal Tape Drive AJ830A

HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive DW085A

HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive EH847A

SCSI Tape Drives

NOTE: Installation of SCSI tape drives requires a SCSI controller kit (PN: 412911-B21).

HP StorageWorks DAT 40 SCSI Internal Tape Drive C5686C

HP StorageWorks DAT 72 SCSI Internal Tape Drive Q1522B

HP StorageWorks DAT 160 SCSI Internal Tape Drive Q1573A

NOTE: For complete listing of tape drive offerings see:

<http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

Additional Options

Disk-Based Backup

RDX Removable Disk Backup

HP StorageWorks RDX160 Internal Removable Disk Backup System

AJ765A

NOTE: 160GB of Disk Storage.

HP StorageWorks RDX320 Internal Removable Disk Backup System

AJ767A

NOTE: 320GB of Disk Storage.

HP StorageWorks RDX500 Internal Removable Disk Backup System

AJ934A

NOTE: 500GB of Disk Storage.

NOTE: Please see the HP RDX Removable Disk Backup System QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/13036_na/13036_na.html

D2D Backup

HP StorageWorks D2D2502i Backup System

EJ001A

NOTE: 2 TB raw capacity/1.5 TB useable capacity.

NOTE: The D2D Backup System are network connected backup products compatible with Windows and Linux. Connectivity using iSCSI protocol over Ethernet network.

Gigabit Ethernet recommended. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

NOTE: Please see the HP D2D Backup Systems QuickSpecs for additional information: <http://www.hp.com/go/d2d>

Uninterruptible Power Systems

HP Tower UPS

HP T750 G2 UPS Models

HP T750 G2 UPS

AF446A

HP T1000 G3 UPS Models

HP T1000 G3 UPS

AF448A

HP T1500 G3 UPS Models

HP T1500 G3 UPS

AF450A

NOTE: For additional information regarding HP Uninterruptible Power Systems, please see the following URL: www.hp.com/go/rackandpower

HP Rack Series

HP Rack 10000 G2 Series (Carbon/Graphite Metallic)

10642 G2 (42U) Rack Cabinet 1200mm Deep - Shock Pallet

AF034A

10642 G2 (42U) Rack Cabinet 1200mm Deep - Pallet

AF038A

10647 G2 (47U) Rack Cabinet 1200mm Deep - Shock Pallet

AF044A

10647 G2 (47U) Rack Cabinet 1200mm Deep - Pallet

AF045A

NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.

NOTE: Please see the Rack 10000 G2 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:

http://h18000.www1.hp.com/products/quickspecs/12402_na/12402_na.html

NOTE: For additional information regarding Rack Cabinets, please see the following URL: <http://www.hp.com/go/rackandpower>

Additional Options

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 .	
	HP Rack Options	
	HP Tower to Rack Conversion Tray, Universal Kit	417705-B21

USB Options	HP ProLiant Server Mouse	AC105A
	HP ProLiant Server Keyboard	AC110A
	HP USB 2-Button Optical Mouse	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA
	USB Floppy Drive, External	DC361B
	NOTE: For the installation of Windows and other OS's, a floppy drive or the HP USB Floppy Drive Key may be required to complete driver installation. A standard USB drive key may not work to complete driver installation.	

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

Memory

HP ProLiant ML110 G6 Models

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

Standard Memory

SATA Models:

2GB or 4 GB of PC3-10600E DDR3 UDIMM running up to 1333MHz with memory kits installed.

Standard Memory with Optional Memory

Up to 8GB of memory is available with the installation of standard and optional memory, 4x 2 GB PC3-10600E un-buffered ECC DDR3 SDRAM DIMM Memory kits.

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

NOTE: For best performance, it is recommended that customer installs memory in identical pairs (Slots 1C and 3D are interleaving pair. Slots 2A and 4B are interleaving pair).

Memory		Slot			
		DIMM1C	DIMM2A	DIMM3D	DIMM4B
Standard (Base Model)	2 GB	Empty	2 GB	Empty	Empty
Standard (Performance Model)	4 GB	Empty	2 GB	Empty	2 GB
Maximum	8 GB	2 GB	2 GB	2 GB	2 GB

Following are memory options available from HP:

HP 2GB 2Rx8 PC3-10600E-9 Kit

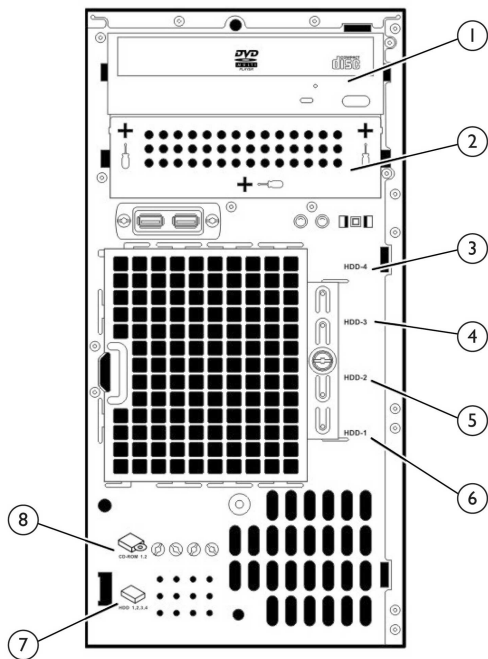
500670-B21

HP 1GB 1Rx8 PC3-10600E-9 Kit

500668-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

Storage



- 1. 1st removable media drive
- 2. 2nd removable media drive
- 3. 4th SAS/SATA hard drive
- 4. 3rd SAS/SATA hard drive
- 5. 2nd SAS/SATA hard drive
- 6. 1st SAS/SATA hard drive
- 7. HDD spare screws
- 8. Removable media drive spare screws

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
DVD Drive	2	1 or 2	Integrated SATA
DVD-RW Drive	2	1 or 2	Integrated SATA

Storage

Hard Drives (SATA Models only)

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and firmware) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SATA Non-Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
750GB 3G 7.2K	Up to 4	3,4,5,6	6 Port SATA controller
500GB 3G 7.2K			NOTE: Transfer rate: 3 Gb/s SATA.
250GB 3G 7.2K			NOTE: RAID support requires HP Smart Array P212 Controller.

SATA Non-Hot Plug 3.5" Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G 7.2K	Up to 4	3,4,5,6	6 Port SATA controller with
			NOTE: Transfer rate: 3 Gb/s SATA.
			NOTE: RAID support requires HP Smart Array P212 Controller.

Hard Drives (SAS Models only)

SAS - Non-Hot Plug 3.5" Enterprise (ENT) Drives

NOTE: SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.

	Quantity Supported	Position Supported	Controller
450GB 3G 15K DP	Up to 4	3,4,5,6	Smart Array P212 Controller
400GB 3G 10K DP			NOTE: Transfer rates of drives are dependent on the maximum transfer rate supported by the Controller. Refer to the Controller technical specifications for details.
300GB 3G 15K DP			
146GB 3G 15K DP			

Maximum Storage Capacity - SATA/SAS Models

Internal	SATA	3.0TB (4 x 750GB)
	SAS	1.8TB (4 x 450GB)

Tape and Disk-Based Backup

NOTE: Installation of SCSI tape drives requires SCSI HBA controller (PN: 412911-B21).

NOTE: For a complete listing of compatible tape and disk-based backup offerings, please visit: www.hp.com/go/connect.

Storage

	Position Supported	Controller	Controller/HBA Option Kit Part Number
Internal USB Tape Drives	2	USB 2.0 port	N/A
DAT 40 USB			
DAT 72 USB			
DAT 160 USB			
DAT 320 USB			
External USB Tape Drives	External	USB 2.0 port	N/A
DAT 40 USB			
DAT 72 USB			
DAT 160 USB			
DAT 320 USB			
Internal SAS Tape Drives	2	HP Smart Array P212 Controller	462828-B21
DAT 160 SAS			
DAT 320 SAS			
LTO-2 Ultrium 448 SAS			
LTO-3 Ultrium 920 SAS			
External SAS Tape Drives	External	HP Smart Array P212 Controller	462828-B21
DAT 160 SAS			
DAT 320 SAS			
LTO-2 Ultrium 448 SAS			
LTO-3 Ultrium 920 SAS			
Internal SCSI Tape Drives	2	HP SC11Xe Host Bus Adapter	412911-B21
DAT 40			
DAT 72			
DAT 160			
External SCSI Tape Drives	External	HP SC11Xe Host Bus Adapter	412911-B21
DAT 40			
DAT 72			
DAT 160			
HP StorageWorks RDX Removable Disk Backup System, Internal	2	USB 2.0 Port	N/A
RDX160			
RDX320			
RDX500			
HP StorageWorks D2D Backup Systems	External	Embedded Network Controller or if the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	N/A
D2D2502i			
D2D2503i			
D2D2504i			

Power Specifications

Part Number	445067-001
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	120	200	230	240
Max Rated Output Wattage Rating	300	300	300	300	300
Nominal Input Current (A rms)	5	5	2.5	2.5	2.5
Max Rated Input Wattage Rating (Watts)	400	N/A	N/A	400	N/A
Max. Rated VA (Volt-Amp)	400	N/A	N/A	400	N/A
Efficiency (%)	80%	80%	80%	80%	80%
Power Factor	0.9	N/A	N/A	0.9	N/A
Leakage Current (mA)	3.5mA	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	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

System Specifications

	Power **
HP ProLiant ML110 G6 Fully Configured	(see **)
Fully Loaded System output Wattage (W)	300W
Fully Loaded System Input Current (A rms)	5A @ 100V, 2.5A @ 200V
Fully Loaded System Thermal (BTU- Hr)	1277BTU
Fully Loaded System VA (Volt-Amp)	400 VA
System Leakage with all power supplies loaded (mA)	3.5mA@110V 3.5mA@220V
System Inrush Current with all power supplies loaded (A)	<150A@240Vac
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) DVD-ROM, (4) PCI cards, and (1) power supply.
Power Cords (13 Cord Sets)	Power Cord Part Number
Country	
	121565-001

NOTE: To review typical system power ratings use the Active Answers HP Power Advisor which is available via the online tool located at URL: <http://www.hp.com/go/hppoweradvisor>

To drill down to calculators:

- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: ML110 G6
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Technical Specifications

System Unit	Dimensions (HxWxD) (with feet)	14.38 x 6.9 x 16.8 in (36.52 x 17.5 x 42.6 cm)	
	Weight (approximate)	Maximum	30.53 lb (13.85 kg)
		(all hard drives, power supplies, and processors installed)	
		Minimum	25.13 lb (11.4 kg)
		(one hard drive, power supply, and processor installed)	
	Input Requirements (per power supply)	Rated Line Voltage	90 to 132 VAC, 180 to 264 VAC
		Rated Input Current	5 A (at 100 VAC), 2.5 A (at 200 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	400 W (at 100 VAC), 400 W (at 200 VAC)
	Power Specifications	To review typical power ratings use the Power Advisor which is available via the online tool located at URL: http://www.hp.com/go/hppoweradvisor	
	Power Supply Output (per power supply)	Rated Steady-State Power	300 W (at 100 VAC), 300 W (at 200 VAC)
		Maximum Peak Power	300 W (at 100 VAC), 300 W (at 200 VAC)
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System may shut down if operating with a fan fault or above 42°C (107.6°F).
		Non-operating	-35° to 65°C (-31° to 149°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	10% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 609 m/min (2000 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 609 m/min (2000 ft/min).

Technical Specifications

Acoustic Noise

Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander 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

LWAd 4.32 Bels

LpAm 24.9 dBA

Operating

LWAd 4.41 Bels

LpAm 25 dBA

NOTE: The listed sound levels above apply to standard SATA configurations. Additional options may result in increased sound levels.

Emissions Classification (EMC)

FCC Rating Class B

Normative Standards CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

HP 250GB 3G SATA 250GB 7,200 rpm
7.2K NHP 3.5" MDL HDD
458939-B21

Capacity	250 GB
Height	1.028 in. (26.1 mm)
Maximum drive dimension	
Width	4.00 in (101.6 mm)
Depth	5.787 in (147.0 mm)
Maximum drive dimension	
Interface	Serial ATA
Transfer Rate (Maximum)	3Gb/s
Native Command Queuing	Supported
Seek Time	Single Track 2.0 ms
(typical reads, including settling)	Average <8.5 ms
	Full-Stroke 21.0 ms
	Rotational Speed 7,200 rpm
Physical Configuration	Bytes/Sector 512
	Logical Blocks 488,397,168
Operating Temperature (system inlet air temperature)	50° to 95° F (10° to 35° C)

Technical Specifications

HP Half-Height 16X Max SATA DVD-ROM Optical Drive	Disk	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, CD-RW, DVD-ROM, DVD+R, DVD+RW
		Capacity	4.7 GB (DVD-5) 8.54 GB (DVD-9)
	Block Size	DVD Media	2,048 bytes
	Interface	SATA	3Gb/s
	Access Times (typical)	Random	<140 ms
		Full-Stroke	<250 ms
	Data Transfer Rate	Sustained	8100 to 21600 KB/s (6X to 16X)
	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)	1.7 x 5.85 x 8.11 in (42.9 x 150 x 195 mm)
		Weight	2.64 lb (1.2 kg)

Embedded NC107i PCIe Gigabit Server Adapter (Embedded)	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.	
	Data Transfer Method	Compliant to x1 PCIe Specification	
	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	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethernet on standard Category 5 UTP	

Technical Specifications

Environment-friendly Products and Approach

End-of-life Management and Recycling

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.

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.

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