

DELL™

OPTIPLX™ FX160

TECHNICAL GUIDEBOOK



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DELL™ OPTIPLEX™ FX160

The desktop computing landscape is evolving. As organizations and their workforces become increasingly distributed and mobile, an explosion of new end-user devices has exacerbated the challenges being faced by IT departments. These challenges include ensuring data and device security regardless of location, managing data and applications consistently across the organization, and providing support for the myriad of emerging devices and applications. Traditional computing has addressed the key customer pain points in a limited fashion.

Dell's new desktop computing vision — Flexible Computing — delivers validated solutions (hardware, software, and services) that augment Dell's traditional desktop offerings and enable IT departments to navigate their increasingly complex environment. Understanding that often the optimal flexible computing approach is a combination of solutions, Dell developed the new OptiPlex FX160 flexible computing node that is optimized for two of Dell's Flexible Computing Solutions: On-Demand Desktop Streaming or Virtual Remote Desktop. In doing so, customers can now confidently invest in a client device that supports the right solution for today with the flexibility to support the needs of tomorrow. For more information about Dell Flexible Computing Solutions, please visit: dell.com/fcs

OPTIPLEX MEANS BUSINESS

The OptiPlex FX160 delivers essential performance and flexibility to help keep your business running:

- Planning support with up to a 36-month lifecycle, stable images, and managed transitions
- The FX160 is design to support either a VRD or ODDS operating environment which best meets the customer's needs.

OPTIPLEX SECURITY

The OptiPlex FX160 ensures data and system security independent of location to help protect your critical data:

- Data is centrally located in the data center, which reduces data security risks from user theft or mismanagement and alleviates business continuity concerns such as distributed data and or data loss
- Defends your systems against hackers and worms, Trojan horses, viruses, and other malicious code attacks with Symantec™ Endpoint Protection for Windows® XP Embedded
- Protects against unauthorized access to your critical data with optional SmartCard keyboards
- Security lock slot provides physical system protection (supporting Kensington-style locks)
- Optional Cable Security Kit, made of hardened steel, is designed to secure commonly-used keyboard, mouse, and other PS2 or USB devices from theft

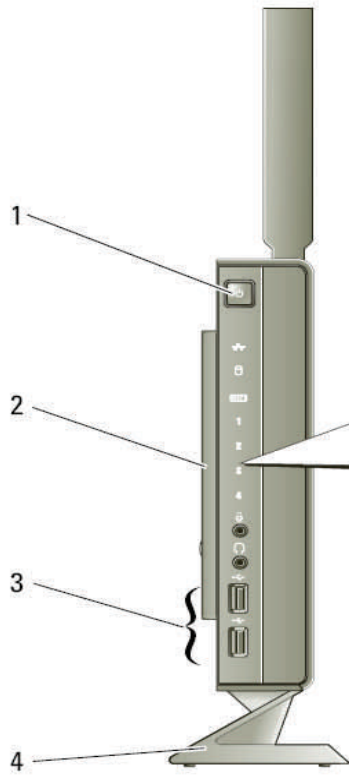
OPTIPLEX IS EASY TO OWN

The OptiPlex FX160 is engineered for flexibility to meet your changing needs:

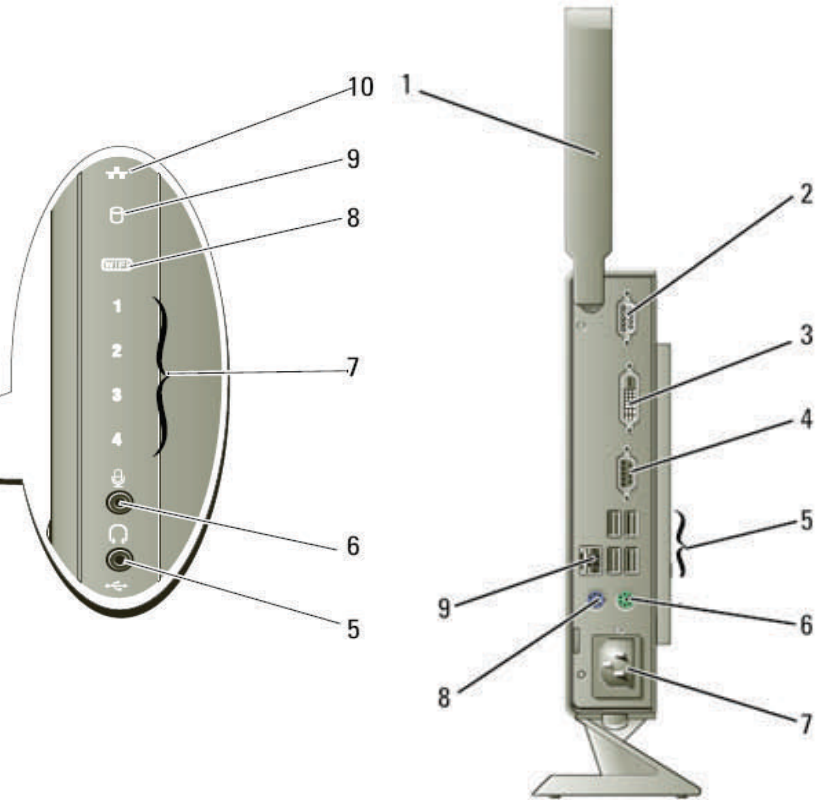
- Designed for single-application workloads, the OptiPlex FX160 features new Intel® Atom™ processors along with
- Dell Flash storage (NVRAM) options for flexible high-end thin client usage models
- Image deployment solution is provided through a free download from Altiris®
- Altiris Deployment Solution enables the ability to push images out to embedded devices and is only available on select models with Windows XP Embedded operating systems or Linux Embedded operating systems in thin client environments
- USB image transfer utility available to flash NVRAM for desk-side deployments
- Centralized image management helps simplify complexities around client deployments with plug and play installations
- Integrated power supply and optional mounting options make the FX160 an easy choice when it comes to maximizing desktop real estate

OPTIPLEX FX160 TINY DESKTOP COMPUTER VIEW

FRONT VIEW



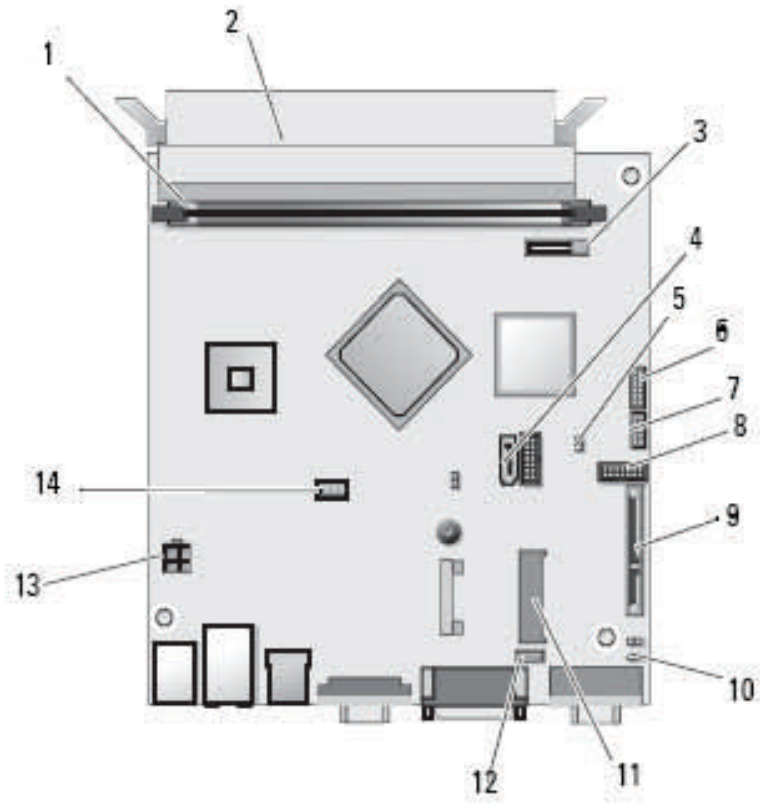
BACK VIEW



FRONT VIEW			
1	Power Button	6	Microphone Connector
2	Side Cover	7	Diagnostic Lights <i>(see your Service Manual for information about light codes)</i>
3	USB 2.0 Connectors (2)	8	Wi-Fi Indicator
4	Stand	9	Hard Drive Indicator
5	Headphone Connector	10	Network Activity Indicator

BACK VIEW			
1	Wireless Antenna (Optional)	6	PS/2 Keyboard Connector
2	Serial Connector	7	Power Connector
3	DVI Connector	8	PS/2 Mouse Connector
4	VGA Connector	9	Network Connector (RJ-45)
5	USB 2.0 Connectors (4)		

SYSTEM BOARD CONNECTORS



CONNECTORS	
1	Memory Connector (DIMM_1)
2	Memory Connector (DIMM_2)
3	Battery (BATTERY)
4	SATA Data Cable Connector (SATA1)
5	Setup Jumper (SETUP_LOCK)
6	Audio Connector (AUDIOF1)
7	USB Connector (USBF1)
8	Front Panel Connector (FRONTPANEL)
9	NVRAM Module Connector (SATA0)
10	Clear CMOS and Password Reset Jumpers (RTCRST and PSWD)
11	WLAN Connector (MINIA1)
12	Fan Connector (FAN_CPU)
13	12V Power Connector (PWR1)
14	SATA Hard-Drive Power Connector (SATA PWR1)

MARKETING SYSTEM CONFIGURATIONS

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer, click Start>Help and Support and select the option to view information about your

OPERATING SYSTEM (ON FLX AND FLX-HD MODELS ONLY)

NOTE: On-Demand Desktop Streaming (ODDS) customers can select either a FLX model (with no hard drive) with a Windows Diskless PC operating system license or a FLX-HD model (with hard drive) which includes one of the following operating systems preinstalled; Windows Vista Business or Windows XP Professional through downgrade rights.

NOTE: The MSFT Diskless PC license guarantees you the right to stream a Microsoft® Windows® Operating System to a diskless client from the data center. Note-Additional Microsoft licensing, such as Software Assurance, may be required with centralization of client images to the data center. Please consult your Microsoft Licensing Specialist for more details.

NOTE: The Desktop Streaming software with Dell and Citrix (Citrix Provisioning Server for desktops) is licensed with each OptiPlex FX160 FLX purchase (per seat).

NOTE: The Desktop software is supported with 3 years of Subscription Advantage, which provides the availability of releases and updates.

	FLX models	FLX-HD models
Windows Vista® operating system		Windows Vista® Business SP1
Windows XP® operating system (through downgrade right)		Windows® XP Professional SP3
Microsoft Diskless PC License	Dell FLX OS License	
DT Streaming License	Citrix® Provision Server for Desktops	
DT Subscription Advantage	Citrix® 3-Year Provision Server for Desktops Subscription Advantage	
OS Media Support	Optional	Optional

OPERATING SYSTEM (ON WINDOWS XP EMBEDDED AND LINUX EMBEDDED MODELS ONLY)

NOTE: Thin Client customers can select either a Microsoft Windows XP Embedded or Novell SUSE Linux Enterprise Thin Client (SLETC) with an embedded Operating System preinstalled on NVRAM flash memory.

NOTE: Configurations with embedded operating systems require NVRAM flash memory. Hard drive is optional and is not required.

NOTE: The Linux embedded operating system configuration does not support the optional integrated Dell 1397 Wireless Half Mini PCIe (802.11bg) Card.

	XP Embedded models	Linux Embedded models
Windows XP Embedded operating system	Windows XP Embedded	
Novell SUSE Linux operating system		SUSE Linux Enterprise Thin Client 10 (SLETC)
Browser Support	Internet Explorer	FireFox
Security Software License	Symantec Endpoint Protection	
Image Management	Altiris Deployment Solution	
Other Support	ICA / RDP	
OS Media Support	Optional	Optional

DELL™ OPTIPLEX™ FX160 TECHNICAL

CHIPSET

	SiSM671 Northbridge and SiS968 Southbridge
Non-volatile memory	
BIOS Configuration FWH (firmware hub)	8Mbit flash IC located at U24 on motherboard
TPM 1.2 Security Device (Trusted Platform Module)	Not supported
NIC EEPROM	1Mbit EEPROM device located at U32 on motherboard
Micro-Controller for RMCP (Remote Management Control Protocol)	RMCP Micro-Controller is located U14 on motherboard. 1Kbyte flash and 64Byte EEPROM

PROCESSOR

NOTE: Processor numbers are not a measure of performance.

NOTE: Processor is soldered down on the motherboard.

NOTE: Intel Atom dual core processor require integrated fan.

Intel® Atom™ Dual Core Processor with Intel Enhanced Intel Speed Step Technology and Execute Disable Bit
Intel Atom 330 Processor (1.6GHz, 1MB L2 cache, 533MHz FSB) (Available Q4 2008)
Intel® Atom Single Core Processor with Intel Enhanced Intel Speed Step Technology and Execute Disable Bit
Intel Atom 230 Processor (1.6GHz, 512 L2 cache, 533MHz FSB)

MEMORY

The computer supports a maximum of **4GB¹** of memory when used with two 2GB DIMMs.

NOTE: 512MB DDR2 Non-ECC SDRAM is only supported on select models with Linux Embedded operating systems.

NOTE: When 800MHz memory is installed the computer will continue to operate the memory bus

Type: DDR2 Synch DRAM Non-ECC Memory ²	800MHz
DIMM Slots	2 (Single Channel)
DIMM Capacities	Up to 2GB
Minimum Memory	512MB on select models
Maximum Memory	4GB*
Configurations: (800MHz)	
4GB* DDR2 Non-ECC SDRAM, (2 DIMM)	X
2GB DDR2 Non-ECC SDRAM, (1DIMM)	X
1GB DDR2 Non-ECC SDRAM, (1 DIMM)	X
512MB DDR2 Non-ECC SDRAM, (1 DIMM)	X (select models)

¹ Up to 1GB may not be available with 32-bit operating systems due to system resource requirements.

² Significant system memory may be used to support graphics, depending on system memory size and other factors.

DELL™ OPTIPLEX™ FX160 TECHNICAL

FLASH STORAGE

OptiPlex FX160 models with an embedded operating system require NVRAM flash storage module. The computer supports a maximum of 2GB of NVRAM flash storage.

NOTE: 512MB NVRAM flash storage is only supported on models with Linux Embedded operating systems.

NVRAM configurations (Single Layer Cell)	
2GB ³ NVRAM	X
1GB ³ NVRAM	X
512MB ³ NVRAM	X (select models)

³ MB means 1 million bytes and GB means 1 billion bytes; total accessible capacity varies depending on operating environment.

DRIVES AND REMOVABLE STORAGE

NOTE: Hard drive is only required on FLX-HD models.

Bays:	
Hard Drives Supported (Internal 2.5")	1
Interface:	
SATA connector(s): number of	1
2.5" Hard Drive: Size, type, speed RPM,	
80GB ⁴ , SATA, 7200 RPM	X (select models)
Optical Drive: (optional external optical drive)	
DVD-ROM (data only) 8x External USB	Optional

⁴ GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.

SYSTEM BOARD CONNECTORS

Half Mini-PCIe Slot(s): number of	1
Serial ATA (SATA) for hard drive: number of	1
Serial ATA (SATA) for NVRAM module: number of	1

GRAPHICS/VIDEO CONTROLLER

SiS Mirage 3D Graphics ² , 256MB Max Video Memory and DirectX 9.0	Integrated on system board
VGA maximum resolution	1920x1200
DVI maximum resolution	1600x1200
Multi-display support	Extended and clone modes
Shared Video memory	32MB, 64MB, 128MB (default), 256MB

² Significant system memory may be used to support graphics, depending on system memory size and other factors.

DELL™ OPTIPLEX™ FX160 TECHNICAL

EXTERNAL PORTS/CONNECTORS

NOTE: See chassis diagrams section for port/connector locations

USB 2.0	6 (2 front, 4 rear)
Serial (native)	One rear
PS/2	Two rear
Network Connector (RJ-45)	One rear
Video:	
VGA	One rear
DVI-D	One rear
Audio:	
Microphone line-in	One minijack front
Headphone/Speaker line-in	One minijack front
AC Power	One rear

COMMUNICATIONS - NETWORK ADAPTER (NIC)

Broadcom (BCM5764M) Gigabit LAN 10/100/1000 (WOL, PXE)	Integrated on system board
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COMMUNICATIONS - WIRELESS

NOTE: Dell Wireless 1397 is available on select models with supporting operating systems.

Dell Wireless 1397 Half Mini PCIe (802.11bg) Card	Optional (factory installed only)
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AUDIO AND SPEAKERS

ADI 1984A High Definition Audio Codec	Integrated on system board
Dell AX210 (USB powered) Speakers	Optional
Dell A510/AX510PA Flat Panel Sound Bar	Optional

KEYBOARD AND MOUSE

Dell USB Entry Keyboard	Optional
Dell USB QuietKey Keyboard	Optional
Dell USB QuietKey Keyboard with Palmrest	Optional
Dell Multimedia Pro Keyboard	Optional
Dell Smart Card USB Keyboard	Optional
Dell Optical USB Mouse with scroll	Optional
Dell Laser Mouse	Optional
Dell Logo Mouse Pad	Optional

DELL™ OPTIPLEX™ FX160 TECHNICAL

MOUNTING BRACKETS/STANDS

Dell OptiPlex Z Stand	Standard
Dell Monitor Mount OptiPlex FX160*	(Available Post Launch)
Dell Wall/Under-desk Mount OptiPlex FX160	Optional

*Designed for dell monitors only

SECURITY

Chassis lock slot	Standard
Cable Security Kit (lock required and sold separately)	Optional

SERVICE AND SUPPORT

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

3-Year Next Business Day On-site Service after Remote Diagnosis ⁵ and Limited Hardware Warranty ⁶ (3-3-3)	Select Windows XP Embedded or Linux Embedded models
3-Year Dell ProSupport for IT	Select FLX and FLX-HD models
Additional Dell ProSupport Services	Optional

⁵ Remote Diagnosis is determination by online/phone technician of cause of issue; may involve customer access to inside of system and multiple or extended sessions. If issue is covered by Limited Hardware Warranty and not resolved remotely, technician and/or part will be dispatched, usually within 1 business day following completion of Remote Diagnosis. Availability varies. Other conditions apply.

⁶ For copy of Ltd Hardware Warranty, write Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see www.dell.com/warranty.

SOFTWARE

NOTE: Software is not available on all models. For more details on Dell Software please to go to www.dell.com/optiplex

Dell ClientManager	Available via Dell.com (select models)
Norton™ Internet Security	90 Day Trial or optional subscription (select models)
McAfee® Security Center	90 Day Trial or optional subscription (select models)

DETAILED ENGINEERING SPECIFICATIONS**SYSTEM DIMENSIONS (PHYSICAL)**

NOTE: System Weight* and Shipping Weight* is based on a typical configuration and may vary based on the computer configuration and if the stand is included. A typical configuration includes: integrated graphics and NVRAM module.

Chassis Volume liters	2.4L without stand and side cover 3.3L with stand and side cover
Chassis Weight* pounds/kilograms	4.0-4.6 / 1.81-2.09
Chassis Dimensions: (HxWxD)	
Height inches/centimeters	9.02 / 22.9 without stand 10.6 / 26.9 with stand
Width inches/centimeters	2.13 / 5.4 with side cover 1.85 / 4.7 without side cover
Depth inches/centimeters	8.86 / 22.5 without antenna 9.92 / 25.2 with antenna
Shipping Weight* pounds/kilograms includes packaging materials	11 / 5
Packaging Parameters (HxWxD)	
Height inches/centimeters	20.00 / 50.8
Width inches/centimeters	13.75 / 34.9
Depth inches/centimeters	9.13 / 23.2

SYSTEM LEVEL ENVIRONMENTAL AND OPERATING CONDITIONS

Temperature	
Operating	10° to 35°C (50° to 95°F)
Non-Operating	-40° to 65°C (-40° to 149°F)
Relative Humidity	
Operating (Noncondensing)	20 to 80 %* (*Max Wet bulb temperature= 29 °C)
Non-Operating (Noncondensing)	5 to 95 %+ (+Max Wet bulb temperature= 38 °C)
Maximum vibration	
Operating	5 to 350 Hz at 0.0002 G2/Hz
Non-Operating	5 to 500 Hz at 0.001 to 0.01 G2/Hz
Maximum Shock	
Operating	40 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 51 cm/sec[20 in/sec])
Non-Operating	105 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 127 cm/sec[50 in/sec])
Maximum Altitude	
Operating	-15.2 to 3048 m (-50 to 10,000 ft)
Non-Operating	-15.2 to 10,668 m (-50 to 35,000 ft)

DELL™ OPTIPLEX™ FX160 TECHNICAL

These form factors utilize a more efficient Active Power Factor Correction (APFC) power supply. Dell recommends only Universal Power Supplies (UPS) based on Sine Wave output for APFC PSUs, not an approximation of a Sine Wave, Square Wave, or quasi-Square Wave (see UPS technical specifications). If you have questions, please contact the manufacturer to confirm the output type.

INTEGRATED POWER SUPPLY

Power Supply Wattage	50W
AC input Voltage Range	90-264V (APFC)
AC input current	0.8-0.4A(APFC)
AC input Frequency	47~63Hz
AC holdup time	>16ms
Minimum Efficiency (Active PFC, Energy Star® Compliant)	85% (20% of max load) 87% (50% of max load) 85% (100% of max load)
DC parameters	
+12.0v output	4.2A
Max total power	50W
BTUs/h (based on PSU max wattage)	41 BTUs/h
3.3v CMOS battery (type and estimated battery life)	CR2032, 7 years
RTC accuracy (time of day)	4 second/24 hours
Power Supply Fan (size and type)	NA
Compliance: (add all that apply)	
Energy Star compliant	Energy Star 5.0 compliant for select models
Blue Angel Compliant	NA
1W requirement	Yes
UL/cUL, CE, CCC, Nemko, TUV, BSMI	Yes

AUDIO

INTEGRATED ADI 1984A HIGH DEFINITION AUDIO CODEC	
High Definition Stereo support	Yes
Number of channels	2
Number of Bits / Audio resolution	16,20 and 24
Sampling rate (recording/playback)	Up to 192KHz
Signal to Noise Ratio	96dB
Wavetable voices	
Analog Audio	Yes
Dolby Digital	NA
THX	NA
Digital out (S/PDIF)	NA

AUDIO (CONT.)

INTEGRATED ADI 1984A HIGH DEFINITION AUDIO CODEC	
Audio Jack Impedance	
Microphone (input impedance)	23K ohms typical
Line-In	NA
Line-Out	NA
Headphone (external load impedance)	32 ohms min
Internal Speaker Power Rating	NA

COMMUNICATIONS - INTEGRATED LAN

Integrated Broadcom 5764M Gigabit LAN	
Connector Type	RJ-45
Data Rates supported	10/100/1000Mb/s
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCIe V1.1 x 1
Integrated memory	Yes (RX -48K Bytes, TX – 8K Bytes)
Data transfer mode (example Bus-Master DMA)	DMA
IEEE standards compliance (example 802.1P)	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3p
Hardware Certifications (example FCC, B, GS mark...)	IEEE compliant
Boot ROM Support	Yes
Network Transfer Mode (example Full Duplex, Half Duplex)	
Network Transfer Rate (example 10BASE-T (half-duplex) 10 Mbps)	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* * This is maximum Network Transfer Rate. Actual Average Network Transfer Rate may vary per Ethernet network and the system configurations.
Manageability (examples WOL, PXE..)	WoL, PXE
Management Capabilities Alerting (examples ASF 2.0 AMT...)	ASF2.0 support for Power ON/OFF, Reset

DELL™ OPTIPLEX™ FX160 TECHNICAL

COMMUNICATIONS - WIRELESS LAN

NOTE: The current draw values were measured over a 1-second interval. The maximum transmit and receive values were measured while transferring a continuous UDP data stream at the highest rate setting of 270 Mbps.

DELL WIRELESS 1397 HALF MINI-CARD

Form Factor	PCI Express Half Mini Card ECN, March 16, 2006
Temperature and Humidity Limitations	
Operating Temperature	0–75°C
Operating humidity	95% maximum (no condensation allowed)
Storage temperature	–40 to +80°C
Storage humidity	95% maximum (no condensation allowed)
Power Characteristics*	
Current draw, Power Save mode	80mW
Current draw, Receive mode	500mW
Current draw, Transmit mode	800mW
Power supply	3.3V
Networking Characteristics	
Compatibility	IEEE 802.11g standard for wireless LAN (OFDM) IEEE 802.11b standard for wireless LAN (DSSS)
Network Operating System	Microsoft Windows Networking
Host Operating System	Microsoft Vista Microsoft Windows XP Microsoft Windows XP Embedded NDIS6 miniport driver
Medium access protocol	CSMA/CA (collision avoidance) with acknowledgment (ACK)
Data rate (Mbps)	IEEE 802.11b: 1,2,5,5,11 IEEE 802.11g: 1,2,5,5,6,9,11,12,18,24,36,48,54 NOTE: The Dell wireless WLAN card uses an automatic transmit rate select mechanism
Radio Characteristics	
Frequency band	IEEE 802.11b: 2.4 GHz (2400-2500 MHz) IEEE 802.11g: 2.4 GHz (2400-2500 MHz)
Modulation technique	IEEE 802.11b: direct sequence spread spectrum (DSSS) CCK for high and medium transmit rate DQPSK for standard transmit rate DBPSK for low transmit rate IEEE 802.11g: orthogonal frequency division multiplexing (OFDM) 52 subcarriers with BPSK, QPSK, 16-QAM or 64-QAM Forward error correction convolutional coding rate: 1/2, 2/3, 3/4
Spreading	IEEE 802.11b: 11-chip Barker sequence
Bit error rate (BER)	Better than 10 ⁻⁵
Nominal output power	IEEE 802.11b: 19 dBm IEEE 802.11g: 15 dBm

DELL™ OPTIPLEX™ FX160 TECHNICAL**GRAPHICS/VIDEO CONTROLLER****NOTE: VGA maximum required and tested resolution is 1920x1200.****NOTE: Maximum resolution may vary based on operating system and monitor support.**

INTEGRATED SIS MIRAGE 3 GRAPHICS²	
Bus Type (example integrated or PCIe x16)	Integrated
GPU core clock	350 MHz Integrated 24 bit RAMDAC
Frame Buffer Memory (onboard and shared) Size and Speed	Up to 256MB of shared system memory ²
Maximum power consumption	4.5 W
Overlay Planes	Yes
Maximum Color Depth	32 bit
Maximum Vertical Refresh Rate	75 Hz
Multiple Display Support	Yes
Operating Systems Graphics/ Video API Support	OpenGL 1.5/DirectX 9.0 ²
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	VGA supports up to 2048x1536@75Hz DVI supports up to 1600x1200@60Hz
External connectors	VGA & DVI

² Significant system memory may be used to support graphics, depending on system memory size and other factors.**HARD DRIVES**

2.5" 80GB⁴ SATA 7200 RPM HDD	
Capacity (bytes)	80,026,361,856
Dimensions inches (W x D x H)	5.87 x 4 x 1
Interface type and Maximum speed	Up to 3Gb/s
Internal buffer size (range)	8 MB
Average Seek Time	8.5 ms
Rotational Speed	7200 rpm
Logical Blocks	156,301,488
Power Source	
DC Power (Max)	Idle 7.0W, Active 10.0W
DC Current	5V (.8A) and 12V (1.8A)
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	41°F to 140°F (50C to 600C)
Relative Humidity Range	20% to 80% non-condensing
Maximum Wet Bulb Temperature	84°F (290C)
Altitude Range	-50 ft to 10000 ft
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°F to 149°F (-400C to 650C)
Relative Humidity Range	10% to 90% non-condensing
Maximum Wet Bulb Temperature	100.4°F (380C)
Altitude Range	-50 ft to 35000 ft

⁴ For hard drives, GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.

DELL™ OPTIPLEX™ FX160 TECHNICAL

OPTICAL DRIVES

EXTERNAL USB DVD-ROM	
External Dimensions W x H x D	142mm x 24mm x 160mm
Weight (max) pounds/kilograms	0.43kg
Interface type	USB 2.0
Disc Capacity	8cm and 12cm
Internal buffer size	198KB
Access Times (typical)	130ms (CD-ROM)/140ms (DVD-ROM)
Maximum Data Transfer Rates	
Writes	
Reads	24x
Environmental Operating Conditions (Non-Condensing):	
Operating Temperature Range	5° to 50°C
Relative Humidity Range	10 to 90% (non-condensing)
Maximum Wet Bulb Temperature	29.4°C
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40° to 65°C
Relative Humidity Range	15 to 95% RH
Maximum Wet Bulb Temperature	29°C
Altitude Range	-200~10600m

BIOS DEFAULTS

BIOS address	F0000h	USB Controller	On	A/C recovery	Off
BIOS chip (NVRAM)	8Mb	Selective USB	Off	Auto Power on	Off
Setup Option	Default Factory Value	USB rear dual /next to RJ45	On	Auto Power time	12:00am
Drives SATA 0	On	Rear Dual USB	On	Low power mode	Off
Drives SATA 1	On	Front Dual USB	On	Remote Wake Up	Off
SATA Operation	AHCI	Multiple CPU Core	On	Suspend mode	S3
Smart Reporting	Off	Hyper-threading	On	ASF Power Management	Disable
Integrated NIC	On (without PXE)	Limit CPUID Value	Off	Image Server	ODDS—Boot to Image Server
Wireless LAN	On	HD Acoustic mode	Bypass	Fast Boot	On
Integrated Audio	On	SATA 1 User Password	Disabled	Numlock Key	On
Video Memory Size	128 MB	Password Changes	Unlocked	POST hot keys	Setup & Boot Menu
Serial #1 Port	Auto	Execute Disable	On	Keyboard Errors	Report

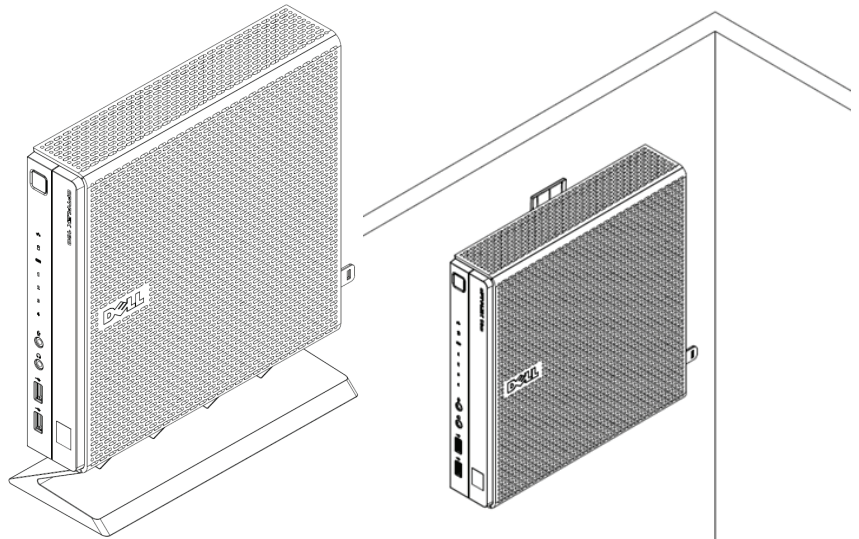
DELL™ OPTIPLEX™ FX160 TECHNICAL

OPTIMAL SYSTEM PLACEMENT

The orientation and location of your computer installation can have affect on your system performance.

SYSTEM ORIENTATION

For optimal thermal and acoustic performance, install the computer in the vertical orientation, using the included stand, or the optional mounting brackets (as shown below).



SYSTEM SPACING

The OptiPlex FX160 is designed to have high performance while operating with low acoustics noise. This is made possible, in part, by the large amount of ventilation on the system. To ensure that the system functions optimally, the ventilation should not be blocked.

STAND

When using the system with the provided stand, please ensure that the system is unobstructed on the vented surfaces. Dell recommends the following:

Top

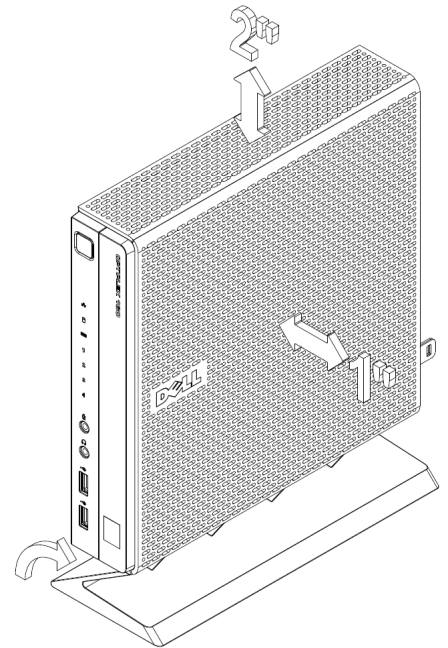
Ensure there is at least 2 inches (50.8 mm) of clearance above the system. This gap will allow higher temperature air to exit the system easily.

Bottom (surface that stand attaches to)

Room temperature air enters the bottom of the system through the stand, on the left side of the system (as indicated by the arrow). Ensure this area is not obstructed.

Right side (as shown in the drawing to the right)

Ensure that there is at least 1 inch (25.4 mm) clearance for optimal system cooling.



OPTIMAL SYSTEM PLACEMENT (CONT.)

WALL MOUNT

If the system is installed using the optional wall mount, ensure that none of the vents are blocked on the system. The OptiPlex 160 has ventilation on four of the 6 surfaces. Space the system so that there is adequate room for proper airflow, as defined by:

Top

Ensure there is at least 2 inches (50.8mm) between the top of the system and the top of the ceiling, desk, or enclosure. This gap will allow heated air to exit the system easily.

Bottom (surface that stand attaches to)

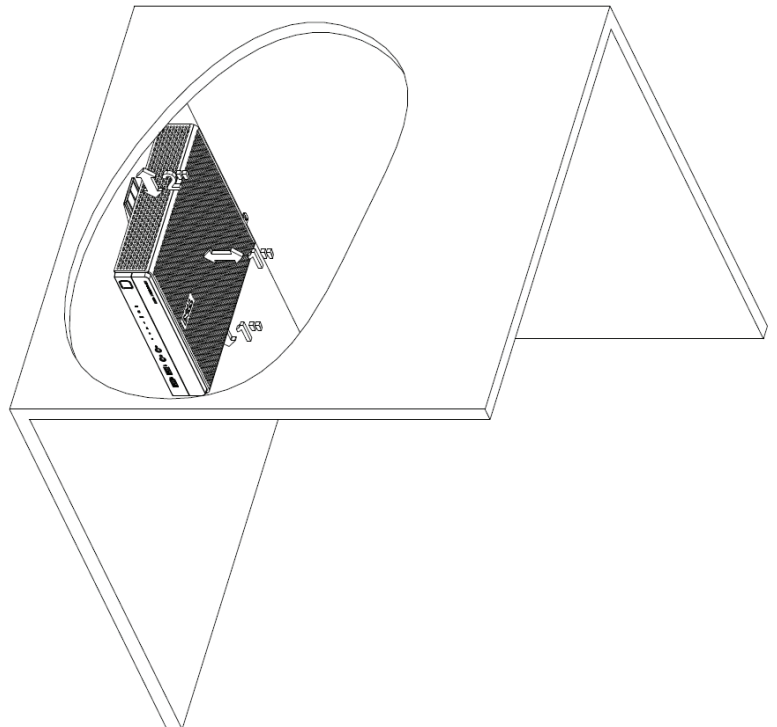
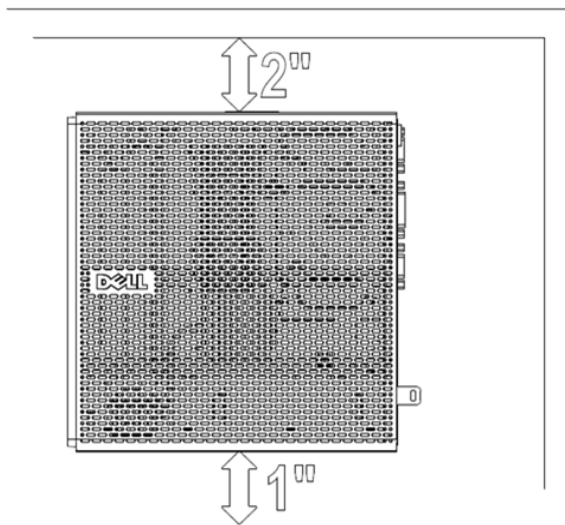
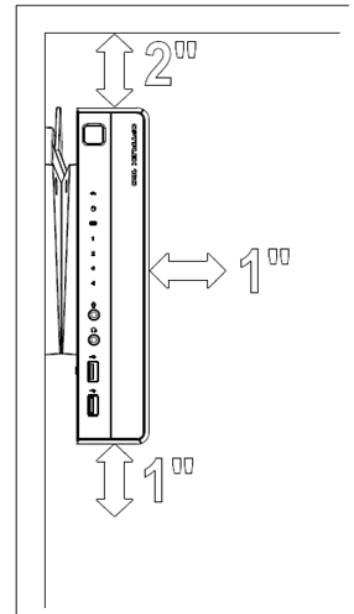
Ensure that there is at least 1 inch (25.4 mm) of clearance below the system. This will allow room temperature air to enter the system for component cooling.

Right side (side opposite of mounting)

Ensure that there is at least 1 inch (25.4 mm) clearance for optimal system cooling.

Left Side (surface that wall mount attaches to)

This gap is defined by the wall mount bracket.



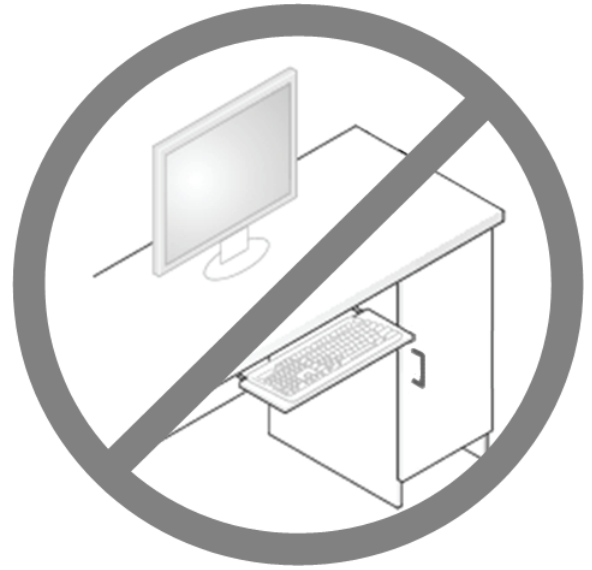
OPTIMAL SYSTEM PLACEMENT (CONT.)

INSTALLING YOUR COMPUTER IN AN ENCLOSURE

Installing your computer in an enclosure can restrict the airflow and impact your computer's performance, possibly causing it to overheat. Follow the guidelines below when installing your computer in an enclosure.

CAUTION: Before installing your computer in an enclosure, read the safety instructions that shipped with your computer.

NOTICE: The operating temperature specifications of the system reflect the maximum ambient operating temperature. The room's ambient temperature needs to be a consideration when installing your system in an enclosure. For example, if the ambient room temperature is at 25° C (77° F), depending on your system's specifications, you may only have 10° C (18° F) before you reach your system's maximum operating temperature.



Space the computer within the enclosure according to the system spacing previously defined in this document.

The enclosure should be designed so that the ambient air entering the system meets the operating temperature requirements of the system. If the enclosure design is not adequate, the air inside the enclosure can get much hotter than the room temperature if there is not adequate inlet and exhaust venting.

The enclosure design should be designed to minimize the temperature increase of the air entering the system by:

- Implementing enclosure venting that allows at least 30% airflow (front and back)

- Implementing enclosure ventilation that aligns well with the system ventilation to allow direct airflow into the system.

 - This is especially important at the exhaust of the system.

- Ensuring that there is ventilation at the highest point of the enclosure (such as a gap between the door and top of the enclosure) to allow hot air to escape.

NOTICE: Do not install your computer in an enclosure that does not allow airflow. Restricting the airflow impacts your computer's performance, possibly causing it to overheat.

REGULATORY COMPLIANCE AND ENVIRONMENTAL

Product related conformity assessment and regulatory authorizations including Product Safety, Electromagnetic Compatibility (EMC), Ergonomics, and Communication Devices relevant to this product may be viewed at www.dell.com/regulatory_compliance. The Regulatory Datasheet for this product is located at: http://www.dell.com/content/topics/global.aspx/about_dell/values/regulatory_compliance/reg_compliance?~ck=ln&c=us&l=en&lnki=0&s=corp

Details of Dell's environmental stewardship program to conserve product energy consumption, reduce or eliminate materials for disposal, prolong product life span and provide effective and convenient equipment recovery solutions may be viewed at www.dell.com/environment. Product related conformity assessment, regulatory authorizations, and information encompassing Environmental, Energy Consumption, Noise Emissions, Product Materials Information, Packaging, Batteries, and Recycling relevant to this product may be viewed by clicking the Design for Environment link on the webpage.

ACOUSTIC NOISE EMISSION INFORMATION**OPTIPLEX FX160**

Component	Typical Configuration	High-end Configuration
CPU	Intel Atom 230 Processor (1.6GHz, 512 L2 cache, 533MHz FSB)	Intel Atom 230 Processor (1.6GHz, 512 L2 cache, 533MHz FSB)
Memory2	1 GB DDRII 667MHz	4 GB4 DDRII 800MHz
HDD (#, capacity)	NA	80 GB4 7200 RPM SATA
NVRAM (#,capacity)	1GB	2GB
WLAN	NA	1510 Half Mini-card
Graphics Adapter	Integrated Adapter	Integrated Adapter

The Declared Noise Emission in accordance with ISO 9296 for the Dell Optiplex 160 is as follows^{1,2}:
(all values L_{WAd} expressed in bels; 1 bel=10 decibels, re 10^{-12} Watts)

Operating Mode	Typical Configuration Declared Sound Power (L_{WAd})	High-end Configuration Declared Sound Power (L_{WAd})
Idle	1.8 ⁴	2.7
HDD Operating	NA	2.7
90% CPU	1.8 ⁴	2.7

The Declared A-weighted Sound Pressure Level in decibels (re 2×10^{-5} Pa), at Operator, Bystander, and Desk Side Positions are measured in accordance with ISO 7779 7.6.1, 7.6.2, and C.15.2 and declared in accordance with ISO 9296 for this product is as follows^{1,3}:

Operating Mode	Typical Configuration Declared Sound Pressure (L_{pA})		High-end Configuration Declared Sound Pressure (L_{pA})	
	Operator Position (L_{pA})	Bystander Position (L_{pA})	Operator Position (L_{pA})	Bystander Position (L_{pA})
Idle	12"	11*	16	13
HDD Operating	NA	NA	16	13
90% CPU	12*	12*	16	14

¹ All tests are conducted according to ISO 7779 and declared according to ISO 9296 except 90% CPU. For this mode, the system CPU was stressed at 90% utilization with no other peripheral device actively seeking. This test mode is not specified in ISO 7779, but was measured using the same microphone distances and measurement techniques defined for the other reported operating modes.

² Declared Sound Power rounded to nearest tenth of a bel per ISO 9296 section 4.4.2

³ Declared Sound Pressure rounded to nearest dB per ISO 9296 section 4.4.3.