



Rack-mount version



Network Video Recorders and VN-NVR-SW Version 5 Software

- Provides real-time over the network digital video surveillance
- VN-NVR-SW has full ViconNet functionality including recording capability
- Open platform allows full functionality with IP cameras from major manufacturers
- Supports megapixel cameras from Vicon and of leading manufacturers
- Supports various compressions, including MPEG-4, M-JPEG and H.264, manufacturer dependant
- Graphical Map feature supports realistic camera location
- Full PTZ control hierarchy for simultaneous or prioritized users
- Multiple channel viewing/recording system allowing networking of Network Video Recorders (NVR), IP cameras and Digital Recorders (DVR)
- Device Site List or logical camera grouping
- Individual picture quality settings per camera
- Remote configuration of devices across the network
- Features LAN and WAN (Internet) connectivity
- Remote alarm capability
- Authorization utility for maximum system security
- Create macros to view/listen and record video and audio, PTZ cameras at preset positions, trigger relays over the network and send email or text message on alarms or on schedule
- Integrated ViconNet VI video intelligence module provides alarms with indication on video
- Record up to 95* cameras on a single NVR
- Record and view live video at different fps without additional video streams

The VN-NVR-SW is NVR software that offers full ViconNet video management capabilities. ViconNet® VN-NVR-SW software is available for installation on any popular brand (i.e., HP/Dell) PC-type computer running Windows® platform (see Technical Information) or as a preconfigured PC, Model VN-NVR-V5 series. This NVR is a powerful PC running Windows XP, ready to record video and audio over the LAN and WAN (Internet). A software package that has all the capabilities of ViconNet version 5 except the recording function is also available, Model VN-WS-SW. Refer to Table 1 for a detailed list of models.


ViconNet version 5 provides an open platform that allows integration with IP cameras, encoders and IP edge devices, including megapixel cameras, from numerous industry-leading manufacturers (see Table 2). Additionally, the ViconNet interface has integrated ViconNet VI video intelligence. It also allows integration with leading access control systems; these integrations may require additional 3rd party software. With version 5, there is support for the ViconNet GUI on a widescreen monitor (16:9 and 16:10 at a variety of resolutions. ViconNet version 5 continues to support the Virtual Matrix Controller (VMC), now supporting the same graphical map showing cameras placement as the ViconNet GUI.

The VN-NVR-SW allows recording any video and audio passed from up to 95* separate cameras simultaneously on the PC's internal hard drive or attached RAID (see Table 3 for details). Refer to Product Specification V113-09 for details of the ViconNet system's powerful features.

ViconNet's Main Window provides a multi-channel display area containing up to 16 connected cameras and microphones. An optional map can be added with actual camera locations, making camera selection simple. The Main Window contains the necessary controls to operate and setup the system.

Vicon requires the use of uninterruptible power supply systems (UPS) to prevent voltage fluctuations that can affect operation, cause video loss and damage to the equipment. Failure to comply voids the unit's warranty

* Depending on resolution, quality and fps settings. See Table 3.

Vicon Product Facts		Model No: VN-NVR-SW	Product Code: Refer to Table 1	SEC: 1	SPEC: V113-20	REV: 1208
----------------------------	-------------------------------------------------------------------------------------	------------------------	-----------------------------------	--------	------------------	-----------

Product Specification

Table 1: Models, Products Codes and Descriptions

Model	Product Code	Description
VN-NVR-SW	9602-00	ViconNet NVR Software; recording plus fully functional ViconNet application for use with ViconNet version 5 Digital Recorders, Video Encoders and IP Cameras. Single site license.
VN-VIEWER-16	9601-10	ViconNet 16-Channel Viewer Software; viewer plus software for use with version 5 Kollector Elite, Pro, Lite and ViconNet Workstations. Views 16 cameras, playback and control PTZ.
VN-NVR-80V5	9602-07	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 80 GB of internal storage, RAID compatible.
VN-NVR-250V5	9602-08	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 250 GB of internal storage, RAID compatible.
VN-NVR-500V5	9602-10	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 500 GB of internal storage, RAID compatible.
VN-NVR-1000V5	9602-20	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 1000 GB (1 TB) of internal storage, RAID
VN-NVR-1500V5	9602-30	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 1.5 TB of internal storage, RAID compatible.
VN-NVR-2000V5	9602-40	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 2.0 TB of internal storage, RAID compatible.
VN-NVR-3000V5	9602-50	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Tower case and 3.0 TB of internal storage, RAID compatible.
VN-NVR-80V5-R	9606-07	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack mount case and 80 GB of internal storage, RAID compatible.
VN-NVR-250V5-R	9606-08	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack mount case and 250 GB of internal storage, RAID compatible.
VN-NVR-500V5-R	9606-10	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack Mount case and 500 GB of internal storage, RAID compatible.
VN-NVR-1000V5-R	9606-20	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack Mount case and 1000 GB (1 TB) of internal storage, RAID
VN-NVR-1500V5-R	9606-30	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack Mount case and 1.5 TB of internal storage, RAID compatible.
VN-NVR-2000V5-R	9606-40	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack Mount case and 2.0 TB of internal storage, RAID compatible.
VN-NVR-3000V5-R	9606-50	Network Video Recorder; Includes ViconNet Version 5 software used to view, record and configure video from IP video devices and Kollector Elite and Pro Digital Recorders. Rack Mount case and 3.0 TB of internal storage, RAID compatible.

Table 2: Compatible Equipment Supported Vicon IP Cameras and Encoders

Model	Description
Kollector Series DVRs	Includes Kollector Elite, Pro and Lite 16-input digital video recorders
I-Onyx® VN-855 Series	Includes high-resolution color, day/night and WDR versions; 24 VAC or PoE
I-Onyx® VN-955 Series	Megapixel cameras, includes color and day/night box cameras, IR and indoor and outdoor camera domes
SurveyorVFT™ Camera Dome Series	Indoor and outdoor models, pendant or in-ceiling, 22X, 23X or 35X PTZ, variety of fixed with varifocal lenses
Roughneck® V910 Impact-Resistant Camera Dome	Outdoor fixed with a variety of varifocal lenses, 24 VAC or PoE available
KTX-4 Encoder	4-channel network encoder converts up to 4 analog video inputs into digital, 24 VAC or PoE
VN-301T Encoder	Single-channel encoder converts analog video input into digital, 24 VAC

Compatible IP Camera Manufacturers (Frequently Updated)

ACTi Corporation
AXIS Communications, Inc.
Panasonic Corporation
Sony Corporation of America

Compatible Megapixel Camera Manufacturers (Frequently Updated)

Arecont Systems, Inc. (Arecont Vision)
IQinVision

ASSOCIATED EQUIPMENT AND ACCESSORIES

Kollector Family of Digital Video Recorders, Product Code varies by model: 16-channel networked digital video recorders. Includes the Kollector Elite, Kollector Pro and Kollector Lite series. Product Specification V112, V128 and V185 respectively.

Model VM-617LCD/VM-619LCD Flat Panel Monitors, Product Code 8776-21/8776-31: 17-inch or 19-inch flat panel monitor for use with Kollector Series recorders and ViconNet VN-NVR systems. Product Specification V171.

Model VM-632LCD/VM-642LCD/VM-646LCD LCD HDTV Monitors, Product Code 9213-00/9214-00/9215-00: 32-inch, 42-inch or 46-inch LCD monitor for use with Kollector Series recorders and ViconNet VN-NVR systems. Product Specification V187.

Model VN-17FLT Monitor, Product Code 8237: 17-inch flat screen monitor for use with Kollector Series recorders and ViconNet VN-NVR systems. Product Specification V127.

NETSWITCH-16 Network Switch, Product Code 8495: 16-port, 10/100 autosensing network switch, stackable. Product Specification V161.

NETSWITCH-24 Network Switch, Product Code 8495-10: 16-port, 10/100 autosensing network switch, stackable. Product Specification V162.

NETSWITCH-24POE Network Switch, Product Code 8495-20: 16-port, 10/100/1000 autosensing network switch with a choice of 24 VAC or PoE power source, stackable. Product Specification V162-20.

Uninterruptible Power Supplies: 725 VA and 1000 VA units with DB9 (RS-232) and USB ports; 120 VAC input/output. Product Specification V147.

Vicon Product Facts		Model No: VN-NVR-SW	Product Code: Refer to Table 1	SEC: 1	SPEC: V113-20	REV: 1208
----------------------------	--	-------------------------------	------------------------------------------	--------	---------------	-----------

The topology of a ViconNet system includes a Nucleus where vital information of all system recorders and workstations is kept. A Nucleus enables each system device to share video and configuration commands. The Nucleus can be configured on a specified Workstation.

ViconNet utilizes two different video compression methods, selectable based on the application's requirements.

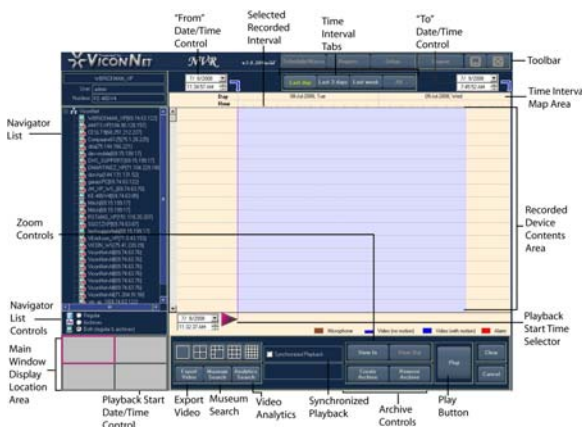
NORMAL: Optimized MPEG-4; a proprietary compression algorithm developed by Vicon that produces outstanding video quality and extended recording durations.

FULL: JPEG; standard full frame compression for use in situations that cannot use a motion compensation compression.

Simultaneously, ViconNet supports other manufacturers JPEG and MPEG compression methods.

ViconNet uses an MD5 type video authentication algorithm. MD5 is a standard authentication that is based on a 128-bit message used to verify data integrity (ViconNet devices only).

ViconNet has vast features to view, record and playback video as well as setup the system to the specific needs of the user.



Toolbar provides access to all major functionality of the system. The Schedule/Macro, Reports, Setup, and Logout buttons are accessible in this area.

Schedule/Macro button allows the running of preconfigured combinations of programmed routines.

- **Reports** button allows the viewing of system status reports.
- **Setup** button allows configuration of the local and remote components, authorizations, sites, authentication, utilities, schedules and macros.
- **Logout** button allows logging out without closing the application. Minimize and Close buttons are also available.

Current Details Area displays the name of the current local device name, user and Nucleus name.

Site Devices are cameras, microphones and sensors that can be remotely configured. **Sites List** provides a physical list of all known network Site areas, connected cameras, PTZ cameras and microphones. **Site Map** allows organizing devices on a map of the physical environment. Cameras can be organized into logical groups and individually named for flexibility and easy access (**Groups List**).

Other Controls provide a palette of buttons that only become active when a valid device is selected. The Other Controls are Audio, Picture, Matrix, Controls, PTZ, Print and Export Image. The selection of each button causes the Control Dialog Display Area to display additional controls.

Control Dialog Display Area offers controls depending on which of the Other Controls is selected.

Function Controls provide a palette of controls to manually start and stop recording, stop currently running live video and macros and set the video quality.

Video Display Area is a multiscreen-selectable view area where all live view and playback video can be viewed. **Display Mode Controls** provide a palette of buttons to select and modify the number of simultaneous video display locations in the Video Display Area. This area can be displayed in single, two-by-two [quad, hexa (six)], three-by-three (nine), four-by-four (sixteen) and full screen (maximized to entire screen). The current video quality is displayed in the lower left portion of each video space.

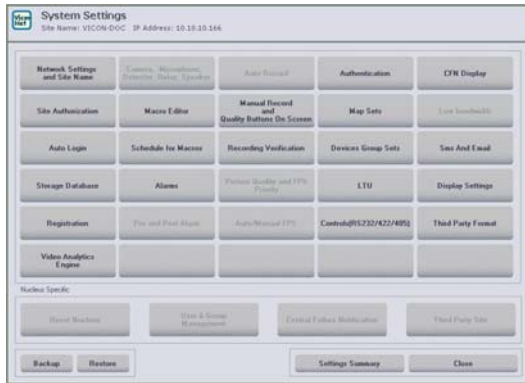
System Status Area provides current information on the number of recording cameras and microphones and the Scheduler state of activity.

Playback Controls provide a palette of buttons used to playback video previously selected in the Navigator Window. The control buttons include Play, Forward, 7-Speed Fast Forward, Backward, 7-Speed Fast Rewind, Stop/Pause, Previous Frame and Next Frame.

Playback Navigator Window graphically displays a timeline of recorded video. It contains all function buttons necessary to control playback video. Cameras and Microphones can be selected from the **Navigator List** and displayed in the timeline. The Display Mode can be selected to configure the number of cameras played back. The **Archive Controls** allow the saving of selected video to the storage location of your choice. The video can be saved to any local or remote storage location, including CD-RW or DVD drives, recognized by the system. An **Export Video** button can be used to create an AVI, Xvid or MPEG-4 file of the selected single camera video segment and save it on the system. **Analytics Search** button is used to search for video displaying behavior violations from one camera at a time. When the **Play** button is selected, the Main Window appears showing the previously selected video. The Navigator List displays a list of the current storage location sources and devices. Navigator Controls List defines what is displayed in the list as a regular database, an archive or both. The **Main Window Display Location Area** is a graphical representation of the Video Display area in the Main window. The **Recorded Devices Contents** displays a list of the devices that have been selected for viewing.

Selection of video and audio for playback can be done using the **Time Interval Tabs**, the **Date/Time Controls**, a scalable timeline defined by the “**From**” and “**To**” **Date/Time Controls**, or the **Playback Start Time Selector**, allowing calling up playback images from any database on the network directly from the screen. **Zoom Controls** enable the selected segment of video easier to view. **Museum Search** allows the search for a specific camera’s data within a defined region of the database, saving the time of searching the whole database. Playback Controls are also displayed. **Quick Playback** allows instantaneous playback of a currently recording, live-view window of a local camera.

There are several high-level configuration features that provide custom setup of the system by means of the **System Settings** menu.



System Settings Window

The **Network Settings and Site Name** configuration allows setup of all site IP address information and a system Nucleus. The Nucleus acts as the coordinator of all running system applications. The Backup Nucleus stores all Nucleus settings to be used if the Nucleus recovery is needed, providing uninterrupted system functionality. **Device** configuration is done remotely by connecting to a Kollector using the Site Selection window.

Macros are defined for those cameras that will be recorded in predetermined routines. They are configured to display and record cameras and activate devices at specific times. Macro configuration can be defined for displayed/played cameras, microphones and sensors, command duration, picture quality, refresh mode and related devices. Macros can be set up to send email or text messages upon alarms or schedule. **SMS and Email** screen configures the system trigger the sending of email and SMSs via a macro.

Site Authorization rights are configured by specific site. Rights provide authority to perform specific system functions for defined users and groups, Administrator or Guest.

Scheduling establishes routines for recording and operating devices.

Alarm response is performed using system macros. Alarms can be programmed to annunciate under specific schedules. Alarms can be triggered by physical sensors, detected video loss, detected video motion, or messages sent over the network. A log is kept of each alarm occurrence.

Manual Recording and Quality allows control of the display quality that applies to manually initiated recording.

The Advanced Settings in **Storage Database** sets the storage configuration parameters, defining where an archive can be saved and duration for which recordings will be stored.

Video is always authenticated, but **Authentication** display can be configured on or off. When display is set to on, a video authentication symbol displays, notifying if the video was authenticated or not.

Central Failure Notification (CFN) enables workstations and Kollector Elites connected to the same Nucleus to receive notifications indicating that certain applications have failed, for example, macro, recording and database failures. It also notifies any device (camera, encoder, DVR or workstation) failure. CFN increases the user’s awareness of problems that occur at unmanned remote sites. The notifying site is the same as the Nucleus. The display of the notification can be programmed to be sent to other workstations/Kollector Elites.

Recording Verification System (RVS) ensures continuous recording by notifying users of any recording errors, since automatic recording and scheduled macros are two of the ViconNet’s most important features. RVS monitors automatic recording activity (audio and video) at all times, both locally and over the network. The RVS includes a watchdog in which the RVS allows the system to reboot under specific conditions.

Auto Login can be activated to allow selected users to automatically log in; when the application starts, the Main window displays without entering a user name/password.

Video Analytics consists of enabling the ViconNet integrated video intelligence used for the detection of unusual events or behavior.

Third Party Site allows cameras from other manufacturers to be accessed over the network to be used with ViconNet.

Third Party Format defines the format of the third party camera selected in the Third Party Site.

Map Sets consists of various maps related maps, for example each floor of a building.

Display Settings provides a variety of screen resolutions and aspect ratios.

LTU enables translating the ViconNet user interface to any language.

Controls RS232/422/485 is used to configure the controls (PTZ joystick, relays, control panel) after the appropriate driver is installed.

Devices Group Sets enables organizing devices into logical groups by any criteria and combining these groups into group sets.

Product Specification

The **Setting Summary** displays all settings for the specified site.

Only available in the Nucleus, **Reset Nucleus** is used to cleanup the Nucleus by removing all associated disconnected sites. **Users & Group Management** defines which system operations are available to each group, per site.

**Table 3: Number of Cameras Capable of Recording from a Single VN-NVR-SW
[for Normal (MPEG) compression]**

Resolution	ViconNet Quality	Record at 30 fps per camera		Record at 15 fps per camera		Record at 7.5 fps per camera	
		Max Cameras Internal Drives	Max Cameras RAID Drives	Max Cameras Internal Drives	Max Cameras RAID Drives	Max Cameras Internal Drives	Max Cameras RAID Drives
720x480	1	32	50	34	55	50	70
720x480	2	33	50	38	60	55	75
720x240	3	34	50	39	63	60	80
720x240	4	35	50	40	65	65	85
360x240	5	38	50	42	75	65	90
360x240	6	38	50	44	80	70	95
360x120	7	38	50	46	85	72	95
360x120	8	40	50	48	90	75	95

This table is based on the following conditions:

1. *NVR dedicated for recording only – not Nucleus or display*
2. *Estimated average motion in 60% of picture; higher motion environments (i.e., a casino) or JPEG compression decreases these numbers by 25%.*
3. *Refer to the minimum requirements of the PC.*

VN-NVR WORKSTATION (Tower and Desktop)

Motherboard/

Power Supply: ATX motherboard with 450 W power supply.

Operating System: Windows® XP Professional or Windows Server® 2003.

CPU: Intel® Core™ 2 Duo 2.66 GHz minimum.

RAM Memory: 2 GB DDR-SDRAM DIMM.

CD-RW Drive/USB: Internal CD-RW drive (optional DVD)/
6 USB ports (2 front, 4 back).

Hard Drive: 250 GB minimum.

Pointing Device: PS-2 or USB wheel mouse.

Keyboard: PS-2 or USB type, 101 keys.

LAN Card: 1 Gb onboard.

VGA Adapter: Video adapter with onboard 128 MB RAM. Dual output.

Cooling: Internal fan, 45 cfm flow rate.

ELECTRICAL

Input Voltage: 115 – 240 VAC ±10%, 50/60 Hz.

Note: Vicon requires the use of uninterruptible power supply systems (UPS) to prevent voltage fluctuations that can affect operation and cause damage to the equipment. Failure to comply voids the warranty.

Current: 115 VAC: 0.8 A max
230 VAC: 0.4 A max.

Power Consumption: 92 Watts nominal.

Heat Equivalent: 5.2 btu/min (1.3 kg-cal/min).

Note: These figures represent the conversion of 100% of the electrical energy to heat. Actual percentage of the heat generated will be less and will vary from product to product. These figures are provided as an aid in determining the extent of cooling required for an installation.

VN-NVR-SW SOFTWARE FEATURES

Open Platform: Compatible with IP cameras from ACTi, AXIS, Panasonic, and Sony; compatible with megapixel cameras from Arecont and IQinVision. Refer to Table 2.

Recording

Capability: Up to 95.
Refer to Table 3 for details.

Main Window

Screen: A multi-channel display area containing up to 16 connected cameras and microphones and all necessary controls to operate and setup the system.

Graphical Map: Supports realistic camera location (a workstation with a dual output VGA will allow showing the Map on a dedicated monitor while viewing video on the other).

Quick Playback: Start video playback of live camera with a few clicks.

Site List: A physical list of all known network Site areas and connected cameras and microphones.

Play from Time: Call up images from any database on the network from Main Screen.

Navigator Window: A graphical display of recorded video. It contains a set of function buttons used to access the video on-screen.

Control Dialog

Display Area: A space to work in conjunction with the Other Controls Area.

Toolbar: An area providing access to all major functionality of the system.

Display Mode

Controls Area: A palette of buttons to set the picture quality (resolution) and refresh mode of the live video display.

Other Controls

Area: A palette of buttons that activate when a valid device is selected from the Site list.

System

Configuration: A Main Settings Menu used for setup of devices, authorization, and all other system functions.

Function Control

Area: A palette of controls used to enable or disable any currently running macros in the system.

Network and Sites

Configuration: The network portion of this feature allows setup of all IP address information and a system Nucleus and Backup Nucleus.

Macro

Configuration: Macros can be defined for recorded or displayed/played cameras, microphones and related devices (sensors).

Device
Configuration: Devices can be configured for system recognition and operation.

Authorization
Rights Setup: Group rights can be configured by specific site. Rights provide authority to perform all system functions.

Log Reporting: Continuously running activity log.

Schedule Function: System can be set to display a video "tour" of multiple channels.

Alarm
Configuration: Alarms can be programmed to announce under special conditions.

Storage
Database Utilities: This utility allows setup and usage of detected hard disks locally.

Authentication: Video authentication is established by site and affects display of destination video.

Central Failure Notification (CFN): Sends notifications indicating certain applications have failed.

GUI Display: Supports 16:9 and 16:10 wide screen @ a variety of resolutions.

CONTROLS AND CONNECTORS

Front Panel: Power switch and indicator.
 LAN indicator.
 Reset switch.
 2 USB ports.

Rear Panel: Power switch.
 Power receptacle.
 Keyboard port mini-DIN type.
 Mouse port mini-DIN type.
 Network port RJ-45 connector.
 USB connectors for peripherals.
 Parallel port for printer.
 Serial (COM) port.
 Speaker output mini phono-type

MECHANICAL

Case Style: Standard mid-height tower or rack-mount.

Dimensions: Tower
 Height: 16.7 in. (424 mm).
 Width: 7.5 in. (191 mm).
 Depth: 16.7 in. (424 mm).

Rack Mount
 Height: 3.4 in. (86 mm).
 Width: 19.0 in. (483 mm).
 Depth: 22.5 in. (572 mm).

Weight: Tower: Approx. 30 lb (13.6 kg).
 Rack Mount: Approx. 26 lb (11.8 kg).

Construction: Steel and plastic.
Color: Black.

Shipping
Dimensions: Tower
 Length: 30 in. (762 mm).
 Width: 13 in. (330 mm).
 Height: 21 in. (533 mm).

Rack Mount
 Length: 30 in. (762 mm).
 Width: 23 in. (584 mm).
 Height: 9.75 in. (248 mm).

Shipping Weight: Tower: 40 lb (18 kg).
 Rack Mount: Approx. 43 lb (19.5 kg)

Shipping Volume: Tower: 4.7 ft³ (0.13 m³).
 Rack Mount: 3.9 ft³ (0.11 m³).

ENVIRONMENTAL

Operating
Temperature Range: 32 to 104° F (0 to 40° C).

Operating
Humidity Range: 0 to 95% relative, non-condensing.

Storage
Temperature Range: -4 to 158° F (-20 to 70° C).

Storage
Humidity Range: 0 to 95% relative, non-condensing.

PC COMPUTER REQUIREMENTS

Motherboard/
Power Supply: ATX motherboard with 450 W power supply.

Operating System: Windows® XP Professional or Windows Server® 2003.

CPU: Intel® Core™ 2 Duo 2.66 GHz minimum.

RAM Memory: 2 GB DDR-SDRAM DIMM.

CD-RW Drive/USB: Internal CD-RW drive (optional DVD)/
 6 USB ports (2 front, 4 back).

Hard Drive: 250 GB minimum.

Pointing Device: PS-2 or USB wheel mouse.

Keyboard: PS-2 or USB type, 101 keys.

LAN Card: 1 Gb onboard.

VGA Adapter: Video adapter with onboard 128 MB RAM. Dual output.

Cooling: Internal fan, 45 cfm flow rate.

Technical Information (cont'd)

