

RECOMMENDED SYSTEM SPECIFICATIONS / CURRENT OLYMPUS SUPPLIED

All computer equipment, including the server and clients, should be used as dedicated terminals for the EndoWorks application. If other than Olympus approved software/hardware is installed on the EndoWorks system, malfunction of the application or corruption of EndoWorks data may occur.

Network Server

- IBM xSeries 3400 M3 server, model number 7379AC1
- Windows 2003 Server R2 SP2
- Intel Quad Core E5620 2.40 GHz processor
- 4 GB RAM
- One of the following HDD configurations:
 - 25-user package with (4) 300 GB hard drives (3 utilizing RAID Level 5 plus a hot swap) 600 GB total
 - 25-user package with (6) 300 GB hard drives (5 utilizing RAID Level 5 plus a hot swap) 1200 GB total
 - 25-user package with (8) 300 GB hard drives (7 utilizing RAID Level 5 plus a hot swap) 1800 GB total
- DVD ROM drive
- LTO3 400/800 GB internal tape backup drive
- Tapes, cleaning cartridge (Optional)
- 19" LCD flat panel monitor (Optional)
- Dual 10/100/1000Base-T NIC
- Redundant power supplies
- External power backup (UPS 1000 Watts) (Optional)
- Warranty – 3 yrs, IBM parts warranty
- Additional Specs: H17.3" x D27.5" x W8.7", 88 lbs

IMAGE CAPTURE WORKSTATION

- Lenovo E30, model number 7783
- Windows XP Professional SP3
- Intel Core i3-2120 3.30 GHz processor
- 2 GB RAM
- 500 GB hard drive (Serial ATA)
- DVD-RW/CD-RW drive
- 19" LCD flat panel monitor
- 10/100/1000Base-T NIC
- Matrox VIO image capture/video card
- Warranty – 3 yrs, Lenovo parts warranty
- Additional Specs: H16.74" x D16.96" x W6.89", 24.7 lbs
- Washable Keyboard with integrated touchpad (Optional)

NON-IMAGE CAPTURE WORKSTATION (REGISTRATION & SCHEDULING)

- Lenovo E30, model number 7783
- Windows XP Professional SP3
- Windows 7 Professional (Optional Customer Supplied system)
- Intel Core i3-2120 3.30 GHz processor
- 2 GB RAM
- 500 GB hard drive (Serial ATA)
- DVD-RW/CD-RW drive
- 19" LCD flat panel monitor
- 10/100/1000Base-T NIC
- Warranty – 3 yrs, Lenovo parts warranty
- Additional Specs: H16.74" x D16.96" x W6.89", 24.7 lbs

Note: EndoWorks 7.4 Non Image Capture Workstations are compatible with EndoCapsule 1.03A Light.

RECOMMENDED SYSTEM SPECIFICATIONS / CURRENT OLYMPUS SUPPLIED (CONT'D)

STANDALONE / PEER-TO-PEER SERVER

- Lenovo E30, model number 7783
 - Windows XP Professional SP3
 - Intel Core i3-2120 3.30 GHz processor
 - 2 GB RAM
 - 500 GB hard drive (Serial ATA)
 - DVD-RW/CD-RW drive
 - Quantum RDX Internal Dock, SATA
 - Quantum RDX Cartridge 500 GB (uncompressed)
 - 19" LCD flat panel monitor
 - 10/100/1000Base-T NIC
 - Matrox VIO image capture/video card
 - Warranty – 3 yrs, Lenovo parts warranty
 - Additional Specs: H16.74" x D16.96" x W6.89", 24.7 lbs
 - Washable Keyboard with integrated touchpad (Optional)
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INTERFACE WORKSTATION

- Lenovo E30, model number 7783
 - Windows XP Professional SP3
 - Intel Core i3-2120 3.30 GHz processor
 - 2 GB RAM
 - 500 GB hard drive (Serial ATA)
 - DVD-RW/CD-RW drive
 - 19" LCD flat panel monitor
 - 10/100/1000Base-T NIC
 - Secondary NIC 10/100/1000 Base-T
 - Warranty – 3 yrs, Lenovo parts warranty
 - Additional Specs: H16.74" x D16.96" x W6.89", 24.7 lbs
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ADDITIONAL HARDWARE

- HP ProCurve 24-port 10/100/1000 Switch
 - HP ProCurve 8-Port 10/100/1000 Switch
 - 56 kbps Modem – external USB
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IT SPECIFICATIONS

MINIMUM (MIN) SYSTEM SPECIFICATIONS*

All computer equipment, including the server and clients, should be used as dedicated terminals for EndoWorks. If other than Olympus QA tested and approved EndoWorks software is installed and run on an Olympus-supplied or customer-supplied server or workstation, malfunction of EndoWorks or destruction of EndoWorks data may result.

Note: Any non-image capture computer can be virtual or physical, as long as all system requirements are met and software is used within only one virtual (or otherwise simulated) hardware system on the licensed computer. Olympus technicians cannot support the virtual environment, only the EndoWorks applications running on it.

NETWORK SERVER (Dedicated Server) (system can be customer supplied)

- Windows 2003 Server R2 32 bit SP2
- Intel Quad Core 2.4 GHz processor
- 4 GB RAM
- 600 GB hard drive (NTFS)
- DVD drive
- Backup system
- 15" VGA monitor (1024x768 resolution)
- NIC 1000Base-T
- Power backup (UPS)

Note: Typically supports an average customer for the life of the hardware. If your facility is a large institution, is capturing video, and/or migrating data from a legacy system, see the Data Storage section for calculating additional storage needs.

Note: Operating system and environment built by customer; Olympus to install application and prerequisites.

IMAGE CAPTURE WORKSTATION (Olympus-Supplied Hardware Only)

- Windows XP Professional SP3
- Pentium Core 2 Dual processor 3.0 GHz
- 2 GB RAM
- 160 GB hard drive
- CD-ROM drive/CD R/W (to transfer images)
- 15" VGA monitor (1024x768 resolution) / 19" (Recommended)
- 100Base-T NIC
- Wireless not supported

NON-IMAGE CAPTURE WORKSTATION (REGISTRATION & SCHEDULING) (system can be customer supplied)

- Windows XP Professional
- Pentium Core 2 Dual processor 3.0 GHz
- 2 GB RAM
- 160 GB hard drive
- CD-ROM drive/CD R/W (to transfer images)
- 15" VGA monitor (1024x768 resolution) / 19" (Recommended)
- 100Base-T NIC
- Wireless not supported

STANDALONE / PEER-TO-PEER SERVER (Olympus-Supplied Hardware Only)

- Windows XP Professional SP3
- Pentium Core 2 Dual processor 3.0 GHz
- 2 GB RAM
- 500 GB available hard drive space
- DVD-ROM drive
- 15" VGA monitor (1024x768 resolution)
- 100Base-T NIC (Min) / 1000Base-T (Recommended) (2 NICs, if not on backbone)

* Minimum specifications should be carefully considered based on facility size and procedure volume.

Contact your local Field Service Engineer to discuss your individual requirements as specifications are subject to change.

MINIMUM (MIN) SYSTEM SPECIFICATIONS* (CONT'D)

INTERFACE WORKSTATION (system can be customer supplied)

- Windows XP Professional SP3
- Intel Core 2 Duo, 3.0 GHz processor (*Min*)
- 2 GB RAM (*Min*)
- 160 GB available hard drive space (*Min*)
- DVD-ROM drive
- 15" VGA monitor (1024x768 resolution)
- 100Base-T NIC (*Min*) / 1000Base-T (*Recommended*) (2 NICs, if not on backbone)

- or -

- Windows 2003 Server R2 32-bit SP2
- Intel Quad Core E5410 2.33 GHz processor (*Min*)
- 3 GB RAM (*Min*)
- 500 GB hard drive (NTFS) (*Min*)
- DVD-ROM drive
- 15" VGA monitor (1024x768 resolution)
- 100Base-T NIC (*Min*) / 1000Base-T (*Recommended*) (2 NICs, if not on backbone)

ADDITIONAL HARDWARE

- Switch 100Base-T (*Min*) / 1000Base-T (*Recommended*)
- 56 kbps modem (for fax capability)

ENDOINTELLIGENCE

EndoIntelligence is an analytical tool for the GI and pulmonary industries, available exclusively through EndoWorks. EndoIntelligence, powered by a proprietary QlikView connection, is the new interactive business intelligence tool for EndoWorks that delivers enhanced reporting functionality. This tool lets you mine your EndoWorks data to create customizable reports using associative search via a graphical interface.

- In an EndoWorks Standalone or Peer-to-Peer environment there are no changes required to the standard specifications.
- In an EndoWorks Network environment there are two supported environments, work with your Olympus personnel to determine your site's server requirements using the Olympus Server Decision Matrix document.
 - In an EndoWorks Network environment, for a facility wanting to install EndoIntelligence on the same server as EndoWorks, the following change to the current minimum specifications is necessary:
 - 4 GB RAM (min)
 - In an EndoWorks Network environment, for a facility wanting to install EndoIntelligence on their own server, separate from EndoWorks, the additional server must meet the following minimum specifications:
 - Windows Server 2008 64-bit
 - 16 GB RAM (min)
- QlikView 11.0._SR2 must be installed.
- IIS (Default version dependent on OS) must be installed.
- Internet Explorer 8 with the Google Chrome Plug-in must be installed (for non-image capture nodes accessing the EndoIntelligence server).

Note: The EndoWorks and/or EndoIntelligence server can be physical or virtual.

For assistance in deciding whether installing EndoIntelligence on the same server as EndoWorks or a second server, contact Olympus to discuss your facility's usage requirements.

ARRA

EndoWorks 7.4 has been tested and certified as modularly compliant by the Certification Commission for Health Information Technology (CCHIT®), an ONC-ATCB, in accordance with the applicable certification criteria adopted by the Secretary of Health and Human Services. EndoWorks 7.4 has been certified for the following criteria in support of Stage 1 meaningful use measures: access control, emergency access, automatic log-off, audit log, integrity, authentication, general encryption, and encryption when exchanging electronic health information.

* Minimum specifications should be carefully considered based on facility size and procedure volume.

ADDITIONAL REQUIRED SOFTWARE

EndoWorks utilizes the following:

- Java JRE 1.7[†]
- Java JAI 1.1.2_01
- Ingres Version 3 database (a facility DBA is not necessary)
- Apache Tomcat 7.0 web server
- Clever Path Reports for analysis reports 4.2
- BrightStor for tape backups 11.5
(supplied with Olympus standalones and servers; not required for customer systems)
- Windows Media Player Version 9 or 10
- Adobe Reader Version 7.09
- Windows Internet Explorer 8 32-bit (for all machine types)
- Windows Internet Explorer 9, 32-bit for Windows 7, for dictation/registration nodes only (optional)
- QlikView[†]

Note: It is not recommended to install EndoWorks on a machine running Windows 2003 Web edition or Windows 2003 Datacenter Edition.

KNOWN SOFTWARE COMPATIBILITY ISSUES

The applications listed have known issues with EndoWorks. If you have questions regarding compatibility of any additional applications, please contact your Olympus field representative.

- Windows Active Directory – If you intend to connect your EndoWorks machine(s) to a domain, please consult your field service representative for implementation guidelines and for information about EndoWorks Advanced Security module
- “GoToMyPC” (not compatible)
- PCAnywhere (not compatible)
- Any version of Java, other than Olympus-supplied version (not compatible)
- Microsoft Systems Management Server
- Microsoft Operations Manager (not compatible)
- Microsoft System Center Operations Manager (not compatible)
- SAI. Server (not compatible)
- Windows SharePoint (not compatible)
- Microsoft Remote Desktop Client (Versions prior to RSS-R6 only)
- Trend Micro Antivirus

Note: EndoWorks is a medical device. Olympus recommends that non-Olympus supplied software not be installed on the system.

[†] Other versions of Java will interfere with the operation of EndoWorks, if not managed properly.

[†] QlikView is only required for EndoIntelligence users.

CONNECTIVITY/DATA TRANSFER

- Olympus recommends:
 - When connecting EndoWorks server to a domain that domain security policy and automatic software pushes are not applied.
 - The use of VLANs for the EndoWorks machines, to better help manage this environment.
 - Static/Reserved IP needed for: server, remote support, HL7, and printer. IP address and name may be changed, but should conform to Olympus Security recommendations.
 - EndoWorks is a browser-based application using Java applets.
 - EndoWorks utilizes TCP/IP and HTTP for communication.
 - DHCP may be utilized for non-server hardware (not applicable for server, gateway, and printers).
 - EndoWorks images transmit across the network upon capture and can be as large as 4 MB each, if compression is set to None.
 - EndoWorks video clips transmit across the network upon saving exam and can be as large as 2 GB each, if limits are not set.
 - EndoWorks supports faxing of reports.
 - EndoWorks requires a minimum 100 Mbps network interface; however, it is recommended that a 1000 Mbps network interface be employed throughout the EndoWorks environment. This includes hubs and switches where EndoWorks data travels. These devices should be configured to AUTO or FULL Duplex. Note some switches will only provide 1000 Mbps speed when set to Auto.
 - Data cables should be terminated correctly and show no obvious signs of abuse or wear. Olympus recommends shielded CAT5E or CAT6 cabling be used.
 - If the MAC address of the network component of an EndoWorks server changes, this can impact Licensing and HL7 implementations. Consult your Olympus Field Representative if this situation occurs.
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DATA STORAGE

The values listed below are an approximation and are dependent on your scope model and mask settings.

Note: Olympus recommends using the 'Lossless' compression setting.

Still-Image File Size

VIO (Digital)	Compression				
	None	Lossless	High	Medium	Low
HD Image	4-mb	2-mb	336-kb	560-kb	985-kb
SD Image	611-kb	378-kb	62-kb	90-kb	175-kb
CV-190 Full Resolution	6-mb	2-mb	400-kb	600-kb	1-mb
File Type	TIF	PNG	JPG	JPG	JPG

*Compression default setting is 'none'.

VIO (Analog)	Compression				
	None	Lossless	High	Medium	Low
SD Image	613-kb	345-kb	70-kb	105-kb	190-kb
File Type	TIF	PNG	JPG	JPG	JPG

*Compression default setting is 'none'.

Video Clip File Size

Vio (Digital)	Video Clip (60 seconds)*
	20 frames/sec.
HD-Scope	110 MB
SD-Scope	23 MB
File Type	AVI

*Maximum video clip time can be set by administrator (up to 30 minutes); clips automatically end at 2 GB.

Note: When the compression setting value is 'None' or 'Lossless' the EndoWorks application also creates a reduced size image (PNG 400KB) which will be used when printing the image.

BACKUP

- List of Olympus recommended files to back up are provided in the EndoWorks 7.4 Service Manual.
 - LTO Tapes can be purchased for Olympus-Supplied servers.
 - Customer-supplied server can use its own network storage backup solution.
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PRINTING

- EndoWorks workstations utilize direct IP printing for a network environment or a USB connection for single computer systems.

Note: Only printers sold by Olympus are tested for compatibility with EndoWorks. The current available printers are as follows:

- HP OfficeJet 6100 – (W x D x H) 18.4 x 15.28 x 7.05in. 10.6 lbs.
 - HP Color LaserJet CP4525dn – (W x D x H) 21.3 x 20.6 x 16.5in. 84.6 lbs.
 - Dymo® LabelWriter 400 Turbo (not sold by Olympus, but tested for compatibility with EndoWorks).
 - Dymo® LabelWriter 450 (not sold by Olympus, but tested for compatibility with EndoWorks).
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UPGRADES AND PATCHES

- EndoWorks updates are provided to customers with Support and Maintenance Agreements (SMA).
 - Install only the approved Microsoft patches, BIOS, and driver files published on www.olympusamerica.com/endoworks. It is recommended that you turn off Microsoft Upgrade Service or Windows Server Upgrade Service, if present.
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ENDOWORKS PORT REQUIREMENTS

The following is a breakdown of known ports the EndoWorks application requires (taken from endoworks.ini):

- HL7SocketListenerPort=1599 (TCP Port). Configurable
 - DicomSocketListenerPort=1598 (TCP Port). Configurable
 - SocketServerPort=0. Any port between 1025 – 65535. Configuration to a specific port in that range.
 - If Active Directory is used, LDAP – TCP Port 389
 - Tomcat 7.0 – TCP Port 80
 - UDP Ports 137, 138
 - If EndoIntelligence is used, TCP Ports 1600, 1601, 1602, and 4780
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INTERFACES

- EndoWorks supports HL7 (ADT, Scheduling, Orders, Results, Billing Codes, PDF).
 - EndoWorks supports DICOM (Modality work list, Images outbound).
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SECURITY

- EndoWorks has the ability to store data covered under HIPAA. The facility controls what data they put in EndoWorks.
- EndoWorks Advanced Security is implemented by CA[®] Inc.'s eTrust[®] Embedded Identity and Access Management application.
 - EndoWorks supports Lightweight Directory Access Protocol (LDAP) and Active Directory interfaces.
 - EndoWorks supports strong password rules (e.g., min length, numeric characters, max repeating characters, password re-use prevention, password expiration with warnings, and lockout after 'X' failed logins — according to eTrust Toolkit).
- EndoWorks supports automatic logoffs.[†]
- EndoWorks logs user access to all sections of application and stores in database (with admin access to information).
- The local EndoWorks administrator can change EndoWorks application security based on user's role.
- EndoWorks is not Clinical Context Object Workgroup (CCOW) compliant.

NETWORK SERVER

- EndoWorks application starts as a service.
- Olympus supplied UPS – If power is lost to the server, the UPS keeps the server running for 5 minutes. If power is not restored in that interval, clean shutdown is initialized.

NOTE: If deploying an EndoWorks workstation or any associated peripherals in the vicinity of a patient, an isolation/separation transformer is required. Typically, an isolation/separation transformer is included as a component of the mobile workstation. Please refer to the mobile workstation instructions for proper use.

The optional UPS, sold for use with EndoWorks network servers, is not classified as medical grade and will not work in conjunction with the isolation/separation transformer. The UPS should not be deployed in the vicinity of a patient. If the customer wishes to use a UPS within the vicinity of a patient, that customer must purchase a medical grade UPS that meets their facility's Biomedical or Clinical Engineering department electrical leakage test requirements.
- Customer-supplied server uses its own network storage backup solution.

REQUIRED RIGHTS AND PERMISSIONS FOR INSTALLATION AND SERVICE OF ENDOWORKS

The Olympus Field Employee requires the following rights and/or permissions to install and service EndoWorks:

- Administrator rights on the local and client machines with the ability to create and configure new Windows users.
- Full Control permissions to the following folders:
 - EWClient
 - EWServer
 - Tomcat 7.0
 - Inetpub
- Rights to install and configure the following files and programs:
 - Java JDK 1.7
 - Internet Explorer 8
 - Internet Explorer 9
 - Google Chrome Plug-in installed with Internet Explorer 8[‡]
 - QlikView 11.0_SR2[‡]
 - IIS[‡]

^{*} EndoIntelligence displays screens containing Patient Health Information (PHI).

[†] EndoIntelligence only loses access to its license when it times out. It does not automatically log off.

[‡] Required when using EndoIntelligence.

REMOTE SUPPORT SERVICES (RSS)

The following services are provided with EndoWorks.

- Remote Desktop control/sharing, when necessary for faster support/training/customization
- Preemptive support of EndoWorks server by monitoring basic system health
- File transfer, when necessary for troubleshooting
- Two options for an RSS connection:
 - Site-to-site (LAN-to-LAN) Secure VPN tunnel
 - Extended Network Connection (ENC) using the internet, using port 443 (non-persistent SSL VPN – see the Extended Network Connection section below for more details).

RSS Port Requirements

Option 1 Site-to-Site VPN (Tables A and B, required for full functionality.)

Table A (Table A is required)

Port	Description
ICMP	Preferred to be enabled
UDP 6665/1691	Monitoring
UDP 4104 / TCP 4105	Internal CA Technology Communication/File Transfer
TCP 4728	Remote Control
TCP 161/162	SNMP (Monitoring – Also require service to be installed)

Table B (Table B is required for complete monitoring)

Port	Description
TCP 7774	Monitoring
TCP 4721/4722	Monitoring
TCP 445	MS-DirectoryServices
TCP 137/139	NetBios

Option 2 ENC

Port	Description
TCP 443	Remote Control / Monitoring *

Olympus recommends you do not use the Windows firewall; however, if you require a software firewall (Windows or otherwise), please ensure that all ports listed in Remote Support Port Requirements and EndoWorks Port Requirements are open to ensure the correct operation of EndoWorks.

Extended Network Connection (ENC)

Olympus Remote Support Services now offers an alternative way to connect to EndoWorks systems via non-persistent SSL type connection over the internet. All RSS services are provided via a single TCP port, which is commonly an open port. This connection type requires that each system has an internet connection.

* ENC connected machines must have public IP Addresses for monitoring.

Contact your local Field Service Engineer to discuss your individual requirements as specifications are subject to change.

ANTIVIRUS EXCLUSIONS

The following is a list of directories/files to be excluded from the virus scan.

Note: These are recommendations only. Olympus has not performed any testing with different antivirus applications to determine their impact on EndoWorks.

Server / Standalone	HL7	Client / Node	Directory / File
Exclude	Exclude	Exclude	<drive>:\Tomcat 5.5
Exclude	Exclude	-	<drive>:\EWServer
Exclude	Exclude	Exclude	<drive>:\Program Files\CA
Exclude	Exclude	Exclude	<drive>:\Program Files\JAVA
Exclude	Exclude	Exclude	<drive>:\Endoworks (where exists)
-	-	Exclude	%SystemRoot%\endonode.ini
Exclude	Exclude	Exclude	<drive>:\EWClient
If existing (The following do not have to be part of the system, exclude only if they already exist.)			
Exclude	Exclude	Exclude	<drive>:\IngresII or <drive>:\Ingres [II]
Exclude	Exclude	Exclude	<drive>:\AIS
Exclude	Exclude	Exclude	<drive>:\Cleverpath Reporter

Note: It is assumed that all subdirectories are also excluded.

AUTOMATIC UPDATES

Automatic updates should be disabled so that non-Olympus approved software/updates are not installed on the EndoWorks machine, which could interfere with normal EndoWorks operation. Disabling automatic updates specifically applies to Microsoft Windows Update or Microsoft Windows Update Server 2.0/3.0. We approve patches from Microsoft periodically and post the approved patches on www.olympusamerica.com/endoworks. In addition, Java updates should not be enabled.

REQUIRED USER ACCOUNTS

During the install process a local administrator account is required named 'Administrator'. This account needs sufficient permissions to update all EndoWorks user accounts. Post install - this account can be renamed or disabled but should remain on the system.

UPDATES AND POLICIES

Please visit www.olympusamerica.com/endoworks and click on the Updates & Policies link to view the latest updates and policies (i.e., Microsoft Critical Updates, Microsoft Patches and Antivirus Policy, etc.).

Contact your local Field Service Engineer to discuss your individual requirements as specifications are subject to change.

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