

HARDWARE REQUIREMENTS

Stand-Alone System

Given values are minimum requirements; those marked in bold italic are recommended values. Please also take notice of the footnotes.

Processor	Pentium IV 1.5 GHz (2 GHz) or better (Comparable AMD processor suitable as well) For video recording and/or with HL7: Pentium IV 2 GHz (3 GHz) or better With >1000 HL7 messages/day: Pentium IV, dual processor, 2 GHz (3 GHz)
Chipset ¹ (relevant for video recording only)	Some old chipsets are not suitable for video recording, e.g.: SIS / VIA with integrated VGA, SIS 735, Intel 845, VIA Pro Savage PM133
Operating System	Windows 2000 Professional, Service Pack 4 or Windows XP Professional, Service Pack 2; Internet Explorer 5.5 or higher; Media Player 6.4.7 or higher; DirectX 9 or higher
Memory	512 MB (1 GB); for video recording: additional 256 MB With HL7: add. 512 MB (+ add. 256/512 MB if >1000/5000 messages/day)
Harddisk	≥40 GB ² (80 GB) (with video recording: ≥200 GB ³ (400 GB)) For video recording: SCSI or UltraDMA (DMA access must be active!) or better
CD-Rom Drive	48 speed
Graphic Adapter	16 Mio. colours, resolution 1024*768 (1280*1024) pixels, 32 MB (128 MB) graphic memory, full DirectX compatible
FireWire Ports	Any on-board FireWire (IEEE1394) port or board supported by Windows 2000 / XP (e.g. Adaptec) (optional for image capturing / video recording only) One separate board required for each source to be connected
FireWire Converter (For analogue video sources only)	Device converting analogue Y/C and/or composite video signals to FireWire, preferably Canopus ADVC55. (optional, if analogue video sources should be connected via FireWire) ⁴
Sound Board	Sound Blaster or compatible (optional)
SCSI Adapter	Any SCSI adapter supported by Windows 2000 / XP (e.g. Adaptec) (optional)
COM Ports	One serial port is required for the connection of each of the following devices: - Remote control connection to video processor - foot switch - modem - Endoscan@ (Olympus ID system) - patient monitoring system
USB-Serial-Converter	Adds additional serial-ports via USB-Connector. (optional) (For example: USB/Serial Adapter Cable provided by the company Ednet.)
Monitor	17" at a resolution of 1024*768 (1280*1024)
Data Input	Mouse, keyboard
Network Adapter	100 MBit/s (1 GBit/s) or better (optional)
Backup	Any tape drive supported by Windows 2000 / XP (e. g. HP Surestore DAT xx GB) and by backup software to be used (e.g. ArcServe)
Printer	HP DeskJet Color or HP LaserJet Color
Modem	Any modem supported by Windows 2000 / XP, preferably Devolo MikroLink ISDN or Devolo MikroLink 56k i (analogous) Remote support software, preferably pcAnywhere (vers. 10.x)
Archiving Device	Any device that can be mapped as a drive, which is readable and writeable, e.g. CD-R, CD-RW, DVD writer, MO, harddisk (optional)
CD / DVD Writer	Any device supported by Windows 2000 / XP and Nero Burning version 6.3 (optional)

¹ It should be checked in advance if the performance of the chipset (or the combination of chipset, processor, harddisk and harddisk controller, respectively) is sufficient for the video recording function.

² Sufficient for 5 years with 1,500 examinations p.a., 8 images per examination (lossless compression)

³ As ², but in addition 5 minutes video per each 10th examination

⁴ ENDOBASE still supports image capturing from analogue video sources via the Matrox frame grabber Orion (AGP or PCI), Meteor II or Meteor II/MC. However, these boards are no longer commercially available and, in addition, current motherboards are often not compatible with them. Therefore it is recommended to connect even analogue video sources via a converter to a FireWire input.

Network Client/ Offline Client

Processor	Pentium IV 1.5 GHz (2 GHz) or better (Comparable AMD processor suitable as well) For video recording: Pentium IV 2 GHz (3 GHz) or better
Chipset ⁵ (relevant for video recording only)	Some old chipsets are not suitable for video recording, e.g.: - SIS / VIA with integrated VGA, SIS 735, Intel 845, VIA Pro Savage PM133
Operating System	Windows 2000 Professional, Service Pack 4 or Windows XP Professional, Service Pack 2; Internet Explorer 5.5 or higher; Media Player 6.4.7 or higher; DirectX 9 or higher
Memory	512 MB (1 GB); for video recording: additional 256 MB
Harddisk	≥10 GB (20 GB) (with video recording ≥20 GB (40 GB)) for offline clients: ≥ 20 GB (40 GB) (with video recording ≥40 GB (80 GB)) For video recording: SCSI or UltraDMA (DMA access must be active!) or better
CD-Rom Drive	48 speed
Graphic Adapter	16 Mio. colours, resolution 1024*768 (1280*1024) pixels, 32 MB (128MB) graphic memory, full DirectX compatible
FireWire Ports	Any on-board FireWire (IEEE1394) port or board supported by Windows 2000 / XP (e.g. Adaptec) (optional for image capturing / video recording only) One separate board required for each source to be connected
FireWire Converter (For analogue video sources only)	Device converting analogue Y/C and/or composite video signals to FireWire, preferably Canopus ADVC55. (optional, if analogue video sources should be connected via FireWire) ⁶
Sound Board	Sound Blaster or compatible (optional)
SCSI Adapter	Any SCSI adapter supported by Windows 2000 / XP (e.g. Adaptec) (optional)
COM Ports	One serial port is required for the connection of each of the following devices: - Remote control connection to video processor - foot switch - modem - Endoscan @ (Olympus ID system) - patient monitoring system
USB-Serial-Converter	Adds additional serial-ports via USB-Connector. (optional) (For example: USB/Serial Adapter Cable provided by the company Ednet.)
Monitor	17" at a resolution of 1024*768 (1280*1024)
Data Input	Mouse, keyboard
Network Adapter	100 MBit/s (1 GBit/s) or better
Printer	HP DeskJet Color or HP LaserJet Color
Modem (only for 1 system in a network)	Any modem supported by Windows 2000 / XP, preferably Devolo MikroLink ISDN I or Devolo MikroLink 56k i (analogous) Remote support software, preferably pcAnywhere (vers. 10.x)
Archiving Device (only for 1 system in a network)	Any device that can be mapped as a drive, which is readable and writeable, e.g. CD-R, CD-RW, DVD writer, MO, harddisk (optional)
CD / DVD Writer	Any device supported by Windows 2000 / XP and Nero Burning version 6.3 (optional)

⁵ It should be checked in advance if the performance of the chipset (or the combination of chipset, processor, harddisk and harddisk controller, respectively) is sufficient for the video recording function.

⁶ ENDOBASE still supports image capturing from analogue video sources via the Matrox frame grabber Orion (AGP or PCI), Meteor II or Meteor II/MC. However, these boards are no longer commercially available and, in addition, current motherboards are often not compatible with them. Therefore it is recommended to connect even analogue video sources via a converter to a FireWire input.

Network Client with HDTV Capability

For processing of HD video signals (SDI or RGBs) a special frame grabber, the Matrox VIO board is required. This board is currently only supported by the following PCs:

Type	IBM IntelliStation M Pro 6218-54Y
CPU	Pentium IV HT, 3.6 GHz, 800 MHz bus
Operating System	Windows XP Professional, SP2
Memory	2 GB DDR2 533
Harddisk	160 GB, 7200 rpm, SATA
CD-Rom Drive	CD-RW/DVD-ROM Combination 16x Max
Graphic Adapter	NVIDIA Quadro FX 4500, PCI-Express ⁷
Frame Grabber	Matrox VIO Duo (from Olympus)

Type	IBM IntelliStation M Pro 6218-E3Y
CPU	Pentium IV HT, 3.4 GHz, 800 MHz bus
Operating System	Windows XP Professional, SP2
Memory	1 GB DDR2 533
Harddisk	80 GB, 7200 rpm, SATA
CD-Rom Drive	CD-RW/DVD-ROM Combination 16x Max
Graphic Adapter	NVIDIA Quadro FX 1400, PCI-Express ⁷
Frame Grabber	Matrox VIO Duo (from Olympus)

Type	IBM IntelliStation M Pro 6218-58Y
CPU	Pentium IV HT, 3.6 GHz, 800 MHz bus
Operating System	Windows XP Professional, SP2
Memory	2 GB DDR2 533
Harddisk	80 GB, 7200 rpm, SATA
CD-Rom Drive	CD-RW/DVD-ROM Combination 16x Max
Graphic Adapter	NVIDIA Quadro FX 1400, PCI-Express ⁷
Frame Grabber	Matrox VIO Duo (from Olympus)

Type	HP Workstation XW 4400 C2D-E6400
CPU	Intel Core 2 Duo E6400, 2,13 GHz
Operating System	Windows XP Professional, SP2
Memory	2 GB RAM
Harddisk	250 GB, SATA
CD-Rom Drive	CD-RW/DVD-ROM Combination
Graphic Adapter	NVIDIA Quadro FX 1500 ⁷ or ATI RADEON X1550
Frame Grabber	Matrox VIO Duo (from Olympus)

⁷ Please take care to install for all NVIDIA cards the newest drivers provided directly by NVIDIA.

Network Server

Processor	Pentium IV 1.5 MHz (2 GHz) or better (Comparable AMD processor suitable as well) With HL7: Pentium IV 2 GHz (3 GHz) or better
Operating System	With >1000 HL7 messages/day: Pentium IV, dual processor, 2 GHz (3 GHz) Windows 2000 Server, Service Pack 4 or Windows Server 2003, SP2, Enterprise Edition; Internet Explorer 5.5 or higher
Memory	1 GB (2 GB) (If many clients and/or complex statistical evaluations: additional 512 MB (1 GB)) With HL7: additional 512 MB If >1000/5000 HL7 messages/day: additional 256/512 MB
Harddisk	Without video recording: ≥80 GB ⁸ (160 GB) With video recording: ≥380 GB ^{9 10} (760 GB, Raid 5)
CD-Rom Drive	48 speed
Graphic Adapter	16 Mio. colours, resolution 1024*768 (1280*1024) pixels
SCSI Adapter	Any SCSI adapter supported by Windows 2000 Server / Server 2003 (e.g. Adaptec) (optional)
Monitor	17" at a resolution of 1024*768 (1280*1024)
Data Input	Mouse, keyboard
Network Adapter	100 MBit/s (1 GBit/s) or better
Backup	Any tape drive supported by Windows 2000 Server / Server 2003 (e. g. HP Surestore DAT xx GB) and by backup software to be used (e.g. ArcServe)
Printer	HP DeskJet Color or HP LaserJet Color
Modem (only for 1 system in a network)	Any modem supported by Windows 2000 Server / Server 2003, preferably Devolo MikroLink ISDN or Devolo MikroLink 56k i (analogous) Remote support software, preferably pcAnywhere (vers. 10.x)
Archiving Device (only for 1 system in a network)	Any device that can be mapped as a drive, which is readable and writeable, e.g. CD-R, CD-RW, DVD writer, MO, harddisk (optional)

⁸ Sufficient for 5 years with 3,000 examinations p.a., 8 images per examination (lossless compression)

⁹ As ⁸, but in addition 5 minutes video per each 10th examination (~300GB)

¹⁰ The videos (~300GB) may also be stored on a separate server

Terminal Server

Processor	Pentium IV 2 GHz (Multicore / Multiprocessor) or better
Operating System	Windows Server 2003, SP2, Enterprise Edition; Server role Terminal Server installed and licensed Internet Explorer 5.5 or higher
Memory	2 GB (≥ 4 GB depending on number of concurrent users)
Harddisk	≥80 GB (160 GB)
CD-Rom Drive	48 speed
Graphic Adapter	16 Mio. colours, resolution 1024*768 (1280*1024) pixels, 32 MB (128 MB) graphic memory, full DirectX compatible
Monitor	17" at a resolution of 1024*768 (1280*1024)
Data Input	Mouse, keyboard
Network Adapter	100 MBit/s (1 GBit/s) or better
Backup	Any tape drive supported by Windows Server 2003 (e. g. HP Surestore DAT xx GB) and by backup software to be used (e.g. ArcServe)
Printer	HP DeskJet Color or HP LaserJet Color

Optional separate Movie and Database Server

Processor	Movie Server: Pentium IV 1.5 GHz (2 GHz) or better (Comparable AMD processor suitable as well)
Operating System	Database Server: Pentium IV, dual processor, 2 GHz (3 GHz) Windows 2000 Professional, Service Pack 4 or Windows XP Professional, Service Pack 2 or Windows 2000 Server, Service Pack 4 or Windows Server 2003, SP2, Enterprise Edition; Internet Explorer 5.5 or higher
Memory	Movie Server: 512 MB (1GB) Database Server: 1 GB (1,5 GB) (reserved for ENDOBASE DB instance) If many clients or complex statistical evaluations: additional 512 MB (1 GB)
Harddisk	Movie Server: ≥380 GB ¹¹ (760 GB, Raid 5) Database Server: ≥20 GB (40 GB)
Graphic Adapter	16 Mio. colours, resolution 1024*768 (1280*1024) pixels
SCSI Adapter	Any SCSI adapter supported by used Windows version (e.g. Adaptec) (optional)
Monitor	17" at a resolution of 1024*768 (1280*1024)
Data Input	Mouse, keyboard
Network Adapter	100 MBit/s (1 GBit/s) or better
Backup	Any tape drive supported by used Windows version (e. g. HP Surestore DAT xx GB) and by backup software to be used (e.g. ArcServe)
Modem (only for 1 system in a network)	Any modem supported by Windows 2000 Server / Server 2003, preferably Devolo MikroLink ISDN or Devolo MikroLink 56k i (analogous) Remote support software, preferably pcAnywhere (vers. 10.x)
Archiving Device (only for 1 system in a network)	Any device that can be mapped as a drive, which is readable and writeable, e.g. CD-R, CD-RW, DVD writer, MO, harddisk (optional)

¹¹ As ⁸, but in addition 5 minutes video per each 10th examination (~300GB)