Hardware Requirements for NEXUS / E&L Software Systems

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Recommended hardware for an E&L workstation PC

CPU:	Intel Core i7, i5, i3 or similar AMD CPU (Ryzen 7, 5, 3)
RAM:	8 GB
Hard disk:	256 GB SSD
Network card:	1 GBit/s; switched connection to the E&L server
Graphics card:	Chipset graphics or PCIe graphics card, min. resolution: 1920 x 1080, 32bit colour depth
Operating system:	Windows 11 Pro 64bit, Windows 10 Pro 64bit
Monitor:	Minimum 22", ideally 24" TFT display with a resolution of 1920 x 1080
	4K/5K resolution monitors are not compatible!
Input devices:	Standard mouse with scroll wheel and high quality keyboard, each connected via USB or PS/2

Additional requirements for direct medical device connections to a PC via video cabling (S-Video-Cabling)

PC System:	Only systems with Intel Chipsets and Intel-CPU can be used.
Case:	Must have the capacity to fit expansion cards – full size or half size
	min. 1x USB 2.0 free for the connection of the video Frame grabber
Serial interface:	2x COM-Ports for data transmission and image trigger (on-board or via PCI/PCIe card)
Frame grabber:	E&L video frame grabber (S-video) with USB 2.0 port

For HDSDI E&L Image Acquisition Station (via video cabling to the E&L PC)

E&L HD Medical-PC 3: Core i5 with 3 GHz, 16 GB, SSD 500GB, Windows 11 Pro
→ **Use of a special PCIe-HDSDI video frame grabber required**

For Cardiac Catheter E&L Diagnostic Documentation (Equipment per cardiac laboratory)

1x E&L workstation PC as above for diagnostic documentation, but with a connectivity option for **at least two 22" TFT displays (1920 x 1080)**.
One display for documentation and one for the viewer.
Recommendation for DICOM Viewer display: EIZO MS230W.
There is no requirement for an X-ray compliant, certified monitor.
1x E&L workstation PC with 22" or 24" TFT display (1920 x 1080) for material and progress documentation (alternatively terminal server access)

For E&L PC with Pacemaker Connection

PC System:	Standard PC identical to the E&L workstation PC, **minimum 2x USB 2.0** ports free for a connection to pacemaker programming devices.

Software, required for E&L Workstation / Terminal Server:

.NET Framework 4.7.2 and 3.5
Visual C++ Redistributable Packages 2015 – 2019 32bit and 64bit
VLC Media Player 32bit (latest version, at least v3.0.18)
Windows Media Player version 8 or higher
Microsoft Edge WebView2 Runtime (minimum v105.0.1342.42, for NAR*[1])

Printer

Laser printers are recommended (USB/LAN)

For E&L Remote Maintenance

Site-to-Site-VPN
further VPN connections on request (e.g. Cisco, Sophos or TeamViewer)
→ When accessing the E&L server (e.g. via Remote Desktop), the 1920 x 1080 resolution must be supported.

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Application and database server

CPU
4 CPU cores with 2 GHz or higher

Mass storage
SCSI/SAS-RAID1- or RAID5 hardware controller with at least 400 GB available, recommended hard disk configuration:
   100GB for operating system
   300GB (minimum) for application partitions
→ SAN, distributed file system or file server cluster integration possible
→ **Cardiac catheter installations: Increase the capacity to at least 1TB**

RAM
8 GB RAM or more (with local SQL-Server at least 16 GB)

Operating System
Windows Server 2022, 2019, 2016 Standard Version or better
→ Client access licenses according to the number of E&L workstations.
→ Windows Server Essentials (2019, 2016) only approved for practices or medical service centres
→ For the use of Novell clients please contact the technical department of NEXUS / E&L.

Required software
.NET Framework 4.7.2 and 3.5
Java Runtime Environment (JRE) at least version 8 update 171
current HTML5-compatible Browser (e.g. Chrome, Edge, Firefox)
Microsoft Edge WebView2 Runtime (minimum v105.0.1342.42)

Virtualization
All versions of VMware, Parallels, Xen and HyperV are supported, depending on the server operating system.

Databases
Microsoft SQL server 2022, 2019, 2017, 2016 Standard or higher version, SQL server cluster
→ **Exception:** E&L test installations may run with SQL Express (version 2019) under conditions[*2]

Data backups
→ see separate E&L data backup concept

Components installed on this server
- E&L application incl. data storage
- HIS Interface (via CWDConnect)
- LTA Interface

Terminal server

Operating System
Windows Server 2022, 2019, 2016, Citrix v6.x or higher
→ approximately 700 MB RAM are used per terminal session with E&L software

Required software
see page 1

Central Import Server

CPU
4 CPU cores (2.5 GHz or higher)

Mass storage
SCSI/SAS-RAID1- or RAID5 hardware controller with at least 200 GB available
Recommended hard disk configuration:
   100GB for operating system
   100GB for temporary objects
→ SAN, Distributed File System or file server cluster integration possible

RAM
8 GB

Operating system
Windows Server 2022, 2019, 2016

Required software
.NET Framework 4.7.2 and 3.5
current HTML5- compatible Browser (e.g. Chrome, Edge, Firefox)

Virtualization
All versions of VMware, Parallels, Xen and HyperV are supported, depending on the server operating system.

DivX codec
DivX 6.9.2 with NEXUS / E&L settings (if video conversion DICOM → AVI is desired)

Data backups
→ see separate E&L data security concept

Supported object classes
- DICOM (Single-Frame, Multi-Frame, Encapsulated PDF, Structured Report)
- E&L SmartBox objects
- File import: e.g. HL7, XML

E&L Long-Term-Archiving

- **PACS integration**

- **Archiving system integration** (e.g. Silent Cube) or other approved solutions

Explanatory Notes

Our Hardware specifications are regularly reviewed and revised. They contain the minimum requirements for new components to be procured. Often existing PCs can be used for NEXUS / E&L software systems. If you have any questions, feel free to contact our technical department on +49 9131 / 810 33 – 0.
→ These hardware specifications apply to product variants NXD of NEXUS / E&L.

Many E&L software modules can also be installed on Microsoft or Citrix terminal server clients. The only exception are modules that require special hardware resources such as video frame grabbers.

If a separate SQL server is to be used then the same requirements apply for this as for the application server.

→ Please note the separate hardware requirements for cardiac catheter installation!

→ In the event of PC conversions, e.g. the replacement of an image acquisition workstation after several years of operation, please contact our technical department or request our current hardware recommendations.

[*1] NAR = NEXUS Advanced Reporting
[*2] - max. use of 2 GB RAM (significant performance losses may occur)
   - max. database size: 10 GB, physical size, not exceedable
   - the „SQL Server Agent" for functions such as "Maintenance Plan" for automatic database backups, is not available; the customer needs to create database backups elsewhere/independently with IT support!