

# Hardware Requirements for NEXUS / E&L Software Systems

## Recommended hardware for an Image Acquisition Station (Full-Examination-License)

CPU:	Intel Core i7, i5, i3 or similar AMD CPU (Ryzen 7, 5, 3)
RAM:	8 GB
Hard disk:	256 GB SSD, alternatively 250 GB HDD
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
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
Operating system:	Windows 10 Pro 64bit → <b>Microsoft .NET Framework 4.7.2 and 3.5 must be installed</b>
Software, required:	CWD 09.08.x or higher: Visual C++ Redistributable Packages 2015 – 2019 32bit and 64bit Windows Media Player version 8 or higher VLC Media Player 32bit (latest version, at least v3.0.16) Microsoft Edge WebView2 Runtime (minimum v105.0.1342.42, only needed for NAR - NEXUS Advanced Reporting)

*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 (High resolution HD)

**E&L HD Medical-PC 3:** Core i5 with 3 GHz, 8 GB, SSD 500GB, Windows 10 Pro  
→ **Use of a special PCIe-HDSDI video frame grabber required**

## For Diagnostic Station (Post-Examination License)

→ Same as Image Acquisition Station with the following additions:

PC System:	no restriction
Processor:	Intel Core i5, i3 or similar AMD processor
Hard disk:	SSD ≥ 128 GB, alternatively HDD ≥ 250 GB

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

**1x E&L Image Acquisition Station** 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 standard 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 diagnostic station, <b>min. 2x USB 2.0</b> ports free for a connection to pacemaker programming devices.
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## Printer

Laser printers are recommended (USB/LAN)

## For E&L Remote Maintenance Station – additional equipment

Remote Maintenance:	Site-to-Site-VPN, further VPN connections on request (e.g. Cisco, Sophos or TeamViewer) → The workstation must support a 1920 x 1080 resolution.
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## E&L Long-Term Archiving (LTA)

PACS integration, archive system integration (e.g. Silent Cube) or other approved solutions

## 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 2019, 2016 Standard Version or better

→ **.NET Framework 4.7.2 and 3.5 must be installed**

→ 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

→ CWD 09.08.x or newer: Visual C++ Redistributable Packages 2015–2019

32/64bit 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)

### Terminal server

Microsoft Terminal server 2019, 2016, Citrix v6.x or higher

→ approximately 700 MB RAM are used per terminal session with E&L software

### Virtualization

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

### Databases

Microsoft SQL server 2019, 2017, 2016, 2014 Standard or higher version, SQL server cluster

→ **Exception:** E&L test installations may run with SQL Express (version 2017) under the following conditions:

- 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!

### Data backups

→ see separate E&L data backup concept

### Components installed on this server

- E&L application incl. data storage

- HIS Interface (via CWDCConnect)

- LTA Interface

## Central Import Server

→ **The Import Server is a new technical system for connecting devices.**

→ **mandatory for E&L-Release 9.x (NG) and higher**

### 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 2019, 2016

→ **.NET Framework 4.7.2 and 3.5 must be installed**

### Required software

→ CWD 09.08.x or newer: Visual C++ Redistributable Packages 2015 – 2019 32bit/ 64bit

→ current HTML5-compatible Browser (e.g. Chrome, Edge, Firefox)

### DivX codec

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

### 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: HL7, XML

## 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 all product variants of NEXUS / E&L, i.a. NXD, NBB, CWD and SBB.**

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.

Existing CWD- installations with Microsoft Windows Server or SQL Server 2012, as Windows 7/8.1 are supported to a limited extent by CWD Classic v8.x. We urgently recommend updating these installations.

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.**

Cable technology: The cable components supplied with standard hardware always enable full functionality of NEXUS / E&L software systems in the examination room. The NEXUS / E&L technical department offers additional cabling solutions at an extra charge (Harting industrial connectors, junction boxes, E&L system cables).