Hard- and software requirements custo diag 5.5.x clinical

System Requirements

Technical requirements for server and clients in custo diagnostic 5.5 and above - dedicated to a clinical environment.

Server

Hardware / Virtual Setup

- HDD min. 250 GB – depending on usage (see below), two partitions 50 GB (System) and 250 GB
- RAM min. 8 GB
- 4x vCPU à 1.5 GHz (depending on work load)

Supported Operating Systems

64bit Windows supported only

- Microsoft Windows 10 64bit (recommended for small environments only. 1703, 1709, 1803, 1809, 1903, 1909, 2004, 20H2)
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Microsoft Windows Server 2019

Note: Windows Server Core Editions are also supported!

Supported Database Systems and Database Servers

- MariaDB (custo diagnostic 5.2.x Installer ships with MariaDB) (recommended)
- Microsoft SQL Server 2008, 2008 R2, 2012, 2014 (all in 32bit and 64bit), 2016, 2019; all Editions: Enterprise, Datacenter, Business Intelligence, Standard, Workgroup, Web
Note: Express Edition is not recommended due to DB size restrictions!
Microsoft SQL Server must be provided/installed/licenced by the customer.

Note: The H2 database, which comes included with custo diagnostic 5.2.x Installer, is not supported in a production environment of custo diagnostic 5.2.x clinical.

Client

Hardware / Virtual Setup

- HDD min. 5 GB
- RAM min. 4 GB
- 1x (v)CPU

Supported Operating Systems

32bit/64bit Windows supported

- Microsoft Windows 10 (Build 1809, 1903, 1909, 2004, 20H2)
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Microsoft Windows Server 2019

Windows Server can be used as a client or Windows Terminal Server - but not for an acquisition/recording workstation.

Ports / Connections

- USB Ports; Number depending on custo med devices in use
- Sufficient WLAN quality for mobile applications
- Bluetooth devices must pass the custo med Bluetooth check.

Requirements for Bluetooth Connectivity

All Bluetooth devices of custo med are working at least with Bluetooth 2.0 EDR specification and are Class-2 devices - which means maximum of 10 meter distance from the device to the PC. Do not use device and custo diagnostic application PC in different rooms. In circumstances where this is required (e.g. bedside ECG in infectious environments to avoid the contamination of the device trolley) please keep both in line of sight.

Satellite Systems

Satellite systems are mobile ECG systems, which contain the custo diagnostic server and custo diagnostic client on the same windows host. Satellite systems can be used in non reliable network situations to acquire ECG recordings locally. The synchronisation between local custo diagnostic server and central custo diagnostic server is done automatically (http/https), when the network is available. Only 64bit operating systems are supported.

System Architecture

Custo diagnostic server is a Apache Tomcat based service. The process responds on ReST/http/https requests and access the database and the raw data directory.

MariaDB for Patient and Examination Information

No special conditions necessary if shipped MariaDB Installer is used.

Microsoft SQL Database for Patient and Examination Information

In case, Microsoft SQL Database should be used (instead of mariaDB):

- SQL Server Instance must be configured to fixed Port (default: 1433)
- SQL credentials must be SQL user-password combination
- SQL user required to be DB Owner
- SQL user must have Server Roles: public; read on master DB
- Location: free of choice (could be a dedicated/separate SQL Server)

Raw Data Directory

- 100 GB are good for a start, necessary examination file storage can be calculated based on the table below, based on usage
- Apache Tomcat service user must have write access to this directory
- Directory should be (very recommended) a local directory on the computer where custo diagnostic server is running
- Location: free of choice; could be a dedicated Windows File Server - but NAS, Samba or CIFS on NetApp is not recommended!
- Data directory must only be accessible by administrators and Apache Tomcat service user

Examination file sizes for storage usage calculation:

Product	File size typical ca.	File size max.
ABPM/Holter combi	20MB	25MB
Holter ECG	15MB	60MB
Spirometry	50KB	256KB
ABPM	128KB	512KB
Resting ECG	200KB (10 Sek.)	unlim.
Stress ECG	20MB (20 Min.)	unlim.
CPET	20MB (20 Min.)	unlim.
Cardiac Rehab Session	6MB (45 Min.)	unlim.
custo kybe	15MB (24h)	unlim.

Network connectivity

For a WiFi based use of ECG recordings a stable, constant WiFi connection is necessary during recording and access.

Firewall setup (by clinic administrator): Server computer must only be accessible by administrators and Apache Tomcat user. All clients only access the custo diagnostic server by using http/https.

In environments of unstable / not constant WiFi connections custo supplies dedicated solutions. (Please ask our local sales partner in this case.) A recording of a holter ECG produces up to 10 MByte of data.

Remote access to customer systems for installation and maintenance

Always accessible connection, based on Teamviewer, VPN dial-in or VPN-site-to-site with RDP access to the dedicated server where the custo diagnostic server is running is highly recommended during installation project and useful for maintenance.

On-demand software may also be used: Teamviewer, WebEx or GoToMeeting sessions. On-demand sessions must be provided on short-notice (10 minutes) during installation project.

Operators Maintenance

Except when otherwise stipulated in written form, the clinic is the operator of the system and takes care for typical operator tasks.

Regarding the maintenance of hardware and software components, the following aspects should be monitored by the operator:

- Hardware and software problems (windows system events)
- Sufficient disk space
- Operating system patches
- CPU performance
- Restart of the server (once per month)
- Backup

IT Security and Data Protection

custo diagnostic server is a windows service based on Apache Tomcat and a database server.

General IT security tasks are part of the operators maintenance and operating:

- Security by proxy/virus scan
- Administration of Windows security
- Protection of Windows shares, program directory and raw data directory must only be readable by administrators and custo diagnostic service user.
- Establishing a firewall
- Security of remote access
- Establishing and monitor a backup process of RAW data, program directory and database

Anti Virus Solutions

There is no general limitation for the usage of virus scanners.

In case of misbehavior or errors, custo med may ask the operator to limit/change the function of the virus scanner.

Subject to change without notice.