



**Hardware recommendations
and basics**

The specifications mentioned in this documents concern general requirements. The definition of the individual hardware and network requirements (e.g. server (pool)) need to be researched and discussed together with all (external) partners. The final hardware requirement documentation shall be approved by and distributed to all responsible partners: the local IT management, the ifa IT management and (if applicable) a third party IT consultant.

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Distribution

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1 Hardware requirements

1.1 Server

The server(s) should be located in a separate room, preferably in the same room as the rest of the IT infrastructure (e.g. patch panels for networks, etc.). The server(s) should be protected by a UPS to prevent it from power outages and lightning. Customers who want to use Microsoft Terminal Services, Citrix Clients or other technologies need to contact an ifa senior consultant.

You should note the following requirements for each type of server:

File server

File server	Requirements		
Component	Minimum*	Recommended	Comment
CPU:	CPU with 4 Cores (e.g. Intel Xeon)	CPU with 8 or more cores (e.g. Intel Xeon)	
Hard disk:	1 Tb useable (RAID-5)	1 Tb useable (RAID-10)	<ul style="list-style-type: none"> - HD size tbd. - ≥ 10.000 rpm. - OS: on separate spins - SSD is an option.
RAM memory:	8 Gb RAM	16 Gb RAM	
Operating system (OS):	Microsoft Windows Server 2008 R2	Microsoft Windows 2008 R2, Microsoft Windows 2012 R2,	
Network:	1 Gbit	2-4 Gbit	
Software:	<ul style="list-style-type: none"> - An "ifa workstation" will be installed on the server. - Additional software needs to be installed on server (see workstation). - Iguana / Chameleon software (HL7 interface engine and HL7 messaging toolkit) will be installed for interpreting, mapping the HL7-interfaces. 		<ul style="list-style-type: none"> - Latest patches need to be installed for all relevant software.
<ul style="list-style-type: none"> - Minimum/Recommended CPU/ RAM is without SQL server installation. - Hardware requirements will increase if SQL server is installed on file server. Installation of SQL server on file server is not recommended in case of parallel data storage (additional SQL database). - Ifa needs to have remote access to the server. To be further discussed and agreed upon. - No real time virus scan on ifa folder. - OS and Data-share on separate spins 			

SQL server

SQL server	Requirements	
Component	Recommended	Comment
CPU:	CPU with 4 or more cores (e.g. Intel Xeon)	
Hard disk:	300Gb useable (RAID 5)	
RAM memory:	4 Gb RAM	
Operating system (OS):	Microsoft Windows 2008 R2, Microsoft Windows 2012 R2	
Network:	1 Gbit	
<ul style="list-style-type: none"> - SQL Server could be installed on file server. If this is done, the HW requirements for the file server increase. - SQL Server 2008 R2 needed. (for a demo system, SQL express edition will be sufficient) - SQL server on separate server in case of parallel data storage. <ul style="list-style-type: none"> o Mix mode / pref. SA account for the (Work flow management needed). o SQL user with full access (db owner), pref. sa account. - Protocol for SQL: TCP / IP named piped/ shared memory - SQL server browser needs to be started. - Firewall configured for SQL Client connections: <ul style="list-style-type: none"> o Allow Port 1433 TCP o Allow Port 1434 UDP o Allow connections to SQLSERVER.EXE 		

Terminal server

Terminal server	Requirements	
Component	Recommended	Comment
CPU:	CPU with 4 or more cores (e.g. Intel Xeon)	
Hard disk:	300Gb useable	
RAM memory:	To be determined. <ul style="list-style-type: none"> - 128 MB per active user. - Minimum 2GB for the OS 	2GB + (X * 128MB) = needed amount of RAM
Operating system (OS):	Microsoft Windows 2008 R2, Microsoft Windows 2012 R2	
<ul style="list-style-type: none"> - Please contact us for individual recommendations in case you want to use more than 10 clients. - No of terminal servers depends on number of users. - Those numbers are for ifa only. Any third-party software installed and running on the Terminalserver will increase those numbers and must be checked with the vendors. 		

1.2 Workstations

When setting up the workstation and the monitor, it is important, that you make sure that enough air circulation is available. In addition, it is important that approximately 5 inches of space are left open for the cables. We recommend having at least 4 electrical sockets and 2 network ports per workstation.

The electrical sockets are used for the PC, the screen, additional instruments, printers, etc. One network port is used for the PC and there should be a spare port for any additional equipment, such as network printers or medical equipment using a network port.

If the telecommunication lines (phones) are also using the network structure, an additional network port is needed. Please keep in mind where each ifa workstation will be positioned to avoid having cables run along the floor to these power and network outlets.

Workstations (Fat-clients)

Fat client	Requirements		
Component	Minimum	Recommended	Comment
Processor:	Intel Core i3 dual	Intel Core i5 or higher	
Hard disk:	100 Gb hard disk	300 Gb hard disk	
RAM memory:	2 Gb	4 Gb RAM	
Operating system (OS):	Microsoft Windows 7 (32bit /64 bit)	Microsoft Windows 8/8.1 (32bit /64 bit)	
Network:	100 Mbit	1 Gbit	
COM-port	For any instrument to connect via a serial connection a COM port is required. PCI card preferable.		Depending on the amount of instruments that need to be connected to the station, 1 or more COM ports are needed.
Software:	<ul style="list-style-type: none"> - Internet Explorer 8 or higher - Windows installer 4.5 - Microsoft Word 2007 or higher (32-bit only) - .NET framework 2.0 - .NET framework 3.5.1 - .NET framework 4.0 - Microsoft Silverlight - Adobe Reader 		<ul style="list-style-type: none"> - To use Word for ifa, a license for Microsoft Word is necessary. - Latest patches need to be installed for the installed OS.
<ul style="list-style-type: none"> - For any instrument to connect via a serial connection a COM port is required. - OS can be 64bit / Office version must be a 32bit version! 			

Thin clients / zero clients

Requirements – depending on ICT-architecture - need to be discussed with an senior ifa consultant.

1.3 Network

The network infrastructure should already be in place and there is a need for a central point where network switches are located. Network ports should be available in each room to which all PCs and other equipment can be connected. It is highly important that a user name for an ifa administrator is set up with administrator rights on your network. The ifa system requires a speed of minimum 100 Mbit, optimal 1Gbit and the TCP/IP-Protocol. If there are any questions about the network architecture, an ifa senior consultant should be contacted to clarify all questions.

1.4 Periphery

In an EMR the use of individual periphery devices is an important issue. In the following chapter the relevant requirements are pointed out and explained.

Monitors

In terms of monitors, the ifa software requires the following:

- The ifa system is optimized for a 1280 x 800 resolution.
- Recommended: wide screen displays with a minimum of 1280 X 800, e.g. 22" TFT with a Full HD (1920 x 1080) resolution, e.g. if conducting a chart review.
- Dual monitor systems recommended for advanced users (image review).
- Native support for touchscreens with MS Windows 7 and Windows 8/8.1

Printers

The ifa system requires the following and can support a lot of different printers:

- The printer must support the required paper size and orientation. This is relevant for prescription forms.
- Multi-tray printers are supported.
- Standard laser printers (e.g. HP, Samsung, Brother, etc.).
- Standard inkjet printers (e.g. Canon, HP, Samsung, Brother, etc.).
- Label printers.
- Dot matrix printers.
- Multifunction printers/devices.
- Local and network printer ports are supported.

Scanners

The ifa system can support a lot of different scanners. However, it requires the following:

- Standard Twain-Interface scanners possible.
- Document scanner like Fujitsu ScanSnaps possible.
- Network scanners.

Others

The peripherals listed in the category “others” are very diverse. However, they are often used:

- Barcode scanners.
- Windows Tablets.
- Webcams.
- Signature pads (provided by ifa).
- RFID cards.

2 HW installation

2.1 Server

The customer's IT-department is required to install the server for the ifa system. Requirements are as follows:

- File share for ifa software.
- SQL server for workflow management (WFM) and eRx database.
- A domain is required (ifa will not install in a workgroup environment).
- UPS support for the server.
- RAID1, RAID5 or RAID10.
- Backup system.
- KVM console.
- Local admin rights are needed on server.
- No real time virus scan on the ifa folder.
- Remote access to server should be possible (to be discussed).

Depending on the roles the ifa server might also be configured as Domain controller, DHCP server, DNS server, etc.

The IT department / IT-professional must ensure that those roles are all configured and working before the ifa team arrives on-site.

2.2 Workstations

The customer's IT-department is required to install the workstations for the ifa system. Requirements are as follows:

- Full access to the file sharing server from each workstation. It is advised to make the share invisible.
- Equal number of serial ports and devices which are to be connected to the workstation.
 - Onboard serial ports recommended over USB-2-serial adapters.
- All other hardware requirements for third party applications and devices like fire wire, USB, grabber cards, etc.
- Printer must be connected and installed.
- Other network devices must be connected and installed.
- All devices and printers that are not used should be deleted.
- No real time virus scan on local ifa folder and ifa network share
- For installation of the ifa client, an admin account is needed.
- For running the ifa application, a normal user account is sufficient

2.3 Periphery

The customer's IT-department is required to install the periphery and prepare all required settings.

Monitors

To prepare monitors for the ifa installation process, the following settings are required:

- Native resolution should be selected.
- A dual monitor should be configured as required (clone, split screen).

Printers

To prepare printers for the ifa installation process, the following settings are required:

- Installed and connected in required configuration.
- Trays, orientation, paper size, print mode should be set.

Scanners

To prepare scanners for the ifa installation process, the following settings are required:

- Installed and connected in required configuration.
- File formats are installed: TWAIN, PDF, JPEG, TIFF...

Others

To prepare other peripherals for the ifa installation process, the customer needs to fulfill the following requirements:

- The components of the other peripherals are installed and connected in the required configuration.
- Barcode scanners usually configured as keyboard (no special ifa hardware required)
- Drawing Tablets (i.e. "WACOM").
 - Usually configured as human input device (no special ifa hardware required).
- Webcams.
 - Normal configuration per vendor's instructions (no special ifa hardware required).
- Signature pads (exclusively delivered by ifa).