



# Recommended Hardware Specifications

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## ***Hardware philosophy***

Incisive Software is not aligned with any one hardware supplier, or a particular brand of hardware. We believe this enables you to negotiate the best possible deal with the supplier of your choice and to have the confidence of non-biased recommendations.

However, we can assist you by helping define what your hardware requirements are likely to be and to offer recommendations for suitable hardware suppliers whom we have worked with before.

We do recommend that all hardware configurations are checked with us before purchase.

We strongly recommend quality hardware supplied by a local supplier who can provide efficient and prompt 'after sales' service. For the more specialised devices such as thermal label printers or document scanners we are able to source these items at less than retail prices.

Where networks are involved, ensure that the same hardware supplier will be carrying out, or is involved with, the network installation or upgrade.

## ***Operating Platform***

Unless otherwise specified, all Incisive applications are designed to be installed on the Microsoft Windows 32 or 64 bit operating system, on the user's workstation.

Incisive applications do not run directly on the Apple or Linux operating systems. It is, however, possible to install Microsoft Windows in virtual environments within the Apple or Linux systems and run the Incisive applications.

## ***Backup system***

A good backup system is mandatory. It is your responsibility to make sure that the backup occurs, the data is valid, and that the data can be restored to a working state.

For larger systems, an Enterprise level system should be installed onto your computer. Do not purchase the cheap brands as they consistently fail.

Your data is put onto electronic media, which should be kept off-site. In the event of a major hardware failure, or the building burning down, the data can then be recovered from the backup media.

If your staff are regularly working late or the computers are frequently not turned off at night you should consider using backup software that can include a file that is being used by another computer. Usually, any files that are open are skipped by the backup software and this may mean that your main database is not being backed up.

If using SQL Server as the database, you should configure the system to perform Transaction Log backups at frequent intervals during the day and transfer the log files to an offsite or alternative SQL Server repository. This option is strongly recommended.

It is not the responsibility of Incisive Medical Systems to ensure that the correct files are being backed up, that the backup media is capable of retaining data, or that regular backups are being actioned.

## STANDALONE Computer (not networked)

ITEM	MINIMUM	PREFERRED
Processor:	1.8 Ghz	i7, 2.8 Ghz or greater
RAM:	4 Gigabyte (32 bit)	8 Gigabytes
Monitor:	17 inch monitor running a resolution of at least 1024x768 at 16 bit colour	22 inch LCD monitor (not widescreen) with resolution of at least 1600x1200 at 24 bit colour
Graphics card:	SVGA graphics card	SVGA graphics card with minimum 512Mb on-board RAM and dual ports
Hard Disk:	500GB	500 GB or greater – 7,200 rpm (or faster)
Ports:	1 USB	3 (or more) USB 2.0 ports
<b>ADDITIONAL:</b>		
Laser Printer:	Any Windows supported laser printer. NB Only laser printers supported	Hewlett Packard printer –multi bin paper trays more convenient Don't use Multi-Function Printers (MFP)
Label Printer:	Dymo Label Writer 400 series	Dymo Label Writer 400
Scanner:	Any scanner, TWAIN compliant	Fujitsu fi-6120c2 document scanner TWAIN compliant. USB or SCSI connection
Internet:	ADSL	Fibre
<b>OTHER SOFTWARE:</b>		
Operating Systems:	Windows 8.1 Professional	Windows 10 Professional
.NET Framework:	Version 4.8	Version 4.8
Remote Control:	Microsoft Remote Desktop, or TeamViewer	Microsoft Remote Desktop with VPN, or TeamViewer
Database:	MS SQL Server 2014 R2 - Express	MS SQL Server 2019
Secure messaging:		HealthLink, Argus, Medical Objects

## WORKSTATION Computer (networked to server)

ITEM	MINIMUM	PREFERRED
Processor:	2.0 Ghz	i7, 2.8 Ghz or greater
RAM:	4 Gigabyte	8 Gigabytes (8GB for 64bit OS)
Monitor:	17 inch monitor running a resolution of at least 1024x768 at 16 bit colour	22 inch LCD monitor (not widescreen) with resolution of at least 1600x1200 at 24 bit colour
Graphics card:	SVGA graphics card	SVGA graphics card with minimum 512Mb on-board RAM and dual ports
Hard Disk:	500 GB - 7200 rpm	500 GB or greater – 7,200 rpm (or faster)
Ports:	1 USB	3 (or more) USB 2.0 ports
Network card:	10/100 Mb Base-T	10/100/1000 Mb Base-T
<b>ADDITIONAL:</b>		
Laser Printer:	Any Windows supported laser printer. NB Only laser printers supported	Hewlett Packard printer –multi bin paper trays more convenient Don't use Multi-Function Printers (MFP) Shared on network
Label Printer:	Dymo Label Writer, network shared	Dymo Label Writer 400, network shared
Scanner:	Any scanner, TWAIN compliant	Fujitsu fi-6120c2, or Canon DR2510C document scanner, TWAIN compliant. USB
Internet:	ADSL	Fibre
<b>OTHER SOFTWARE:</b>		
Operating Systems:	Microsoft Windows 8.1 Professional	Windows 10 Professional
.NET Framework:	Version 4.8	Version 4.8
Remote Control:	Microsoft Remote Desktop, or TeamViewer	Microsoft Remote Desktop with VPN, or TeamViewer
Database:	Not required, database on Server	Not required, database on Server
Secure messaging:	Not required on workstation	Not required on workstation

## SERVER Computer ( 5 < workstations)

ITEM	MINIMUM	PREFERRED
Processor:	1.8 Ghz	Quad Core, 2.8 Ghz or greater
RAM:	8 Gigabyte	12 GB. More may be required if SQL Server on this server.
Monitor:	17 inch monitor running a resolution of at least 800x600 at 16 bit colour	17 inch monitor running a resolution of at least 1600x1200 at 16 bit colour
Graphics card:	SVGA graphics card	SVGA graphics card
Hard Disk:	500 GB - 7200 rpm	500 GB or greater – 7,200 rpm (or faster)
Network card:	10/100 Mbs Base-T	100/1000 Mb Base-T
Ports:	1 USB	3 (or more) USB 2.0 ports
<b>ADDITIONAL:</b>		
Laser Printer:	Any Windows supported laser printer. NB Only laser printers supported See comments on Page 8	Network printer recommended
Label Printer:	Dymo Label Writer 400	Not recommended on dedicated server
Scanner:	Any scanner, TWAIN compliant	Not recommended on dedicated server
Internet:	ADSL	Fibre
<b>OTHER SOFTWARE:</b>		
Operating Systems:	Windows Server 2012 R2	Windows Server 2019 Standard 64 bit
.NET Framework:	Version 4.8	Version 4.8
Remote Control:	Microsoft Remote Access, or TeamViewer	Microsoft Remote Desktop with VPN, or TeamViewer
Database:	MS SQL Server 2014 R2 Express	MS SQL Server 2019 Express or Std.
Secure messaging:		HealthLink, Argus, Medical Objects

## SERVER Computer ( 5 > workstations)

ITEM	MINIMUM	PREFERRED
Processor:	Quad Core, 2.8 Ghz or greater	Discuss requirements with your IT provider
RAM:	8 Gigabytes	16 GB or more. Double this if Virtual environment Ideally SQL Server will be on a separate server. Additional RAM may be required
Monitor:	17 inch monitor running a resolution of at least 1600x1200 at 16 bit colour	17 inch monitor running a resolution of at least 1600x1200 at 16 bit colour
Graphics card:	SVGA graphics card	SVGA graphics card
Hard Disk:	500 GB - 7200 rpm	1 TB or greater – 15,000 rpm (or faster) SAAS drive. RAID 5 recommended
Network card:	10/100 Mbs Base-T	100/1000 Mb Base-T Dual cards if necessary
Ports:	1 USB	3 (or more) USB 2.0 or 3.0 ports
<b>ADDITIONAL:</b>		
Laser Printer:	Network printer recommended	Network printer recommended
Label Printer:	Not recommended	Not recommended
Scanner:	Not recommended on server	Not recommended on dedicated server
Internet:	ADSL	Fibre
UPS:		Required
<b>OTHER SOFTWARE:</b>		
Operating Systems:	Windows Server 2012 R2	Windows Server 2019 Standard (64 bit)
.NET Framework:	Version 4.8	Version 4.8
Remote Control:	Microsoft Terminal Server, or Citrix Metaframe; with VPN	Microsoft Terminal Server, or Citrix Metaframe; with VPN
Database:	MS SQLServer 2014 R2 Express	MS SQL Server 2019 w/CALs
Secure messaging:		HealthLink, Argus, Medical Objects
	No other software installed, especially not Microsoft Exchange	

## Terminal Services Application Server

If applications are provided via the thin-client architecture of Microsoft Terminal Services, we recommend that a separate server is used exclusively for this purpose.

Note that Incisive products are not specifically certified nor warranted to operate within Terminal Services or Citrix Meta-frame. Settings within the Incisive software allow for some specific configuration.

ITEM	MINIMUM	PREFERRED
Processor:	2.0Ghz	Quad Core, 2.8 Ghz or greater
RAM:	8 Gigabytes	12 Gigabytes or more Very dependent on the number of connections
Monitor:	17 inch monitor running a resolution of at least 1024x768 at 16 bit colour	17 inch monitor running a resolution of at least 1600x1200 at 16 bit colour
Graphics card:	SVGA graphics card	SVGA graphics card
Hard Disk:	500 GB - 7200 rpm	500 GB or greater – 7,200 rpm (or faster) Your choice of RAID arrangements
Network card:	10/100 Mbs Base-T	10/100/1000 Mbs Base-T Dual cards if necessary
Ports:	Not required	3 (or more) USB 2.0 ports
<b>ADDITIONAL:</b>		
Laser Printer:	Network printer recommended	Network printer recommended
Label Printer:	Not recommended	Not recommended
Scanner:	Not recommended on server	Not recommended on dedicated server
Internet:	ADSL	Fibre
UPS:		Required
<b>OTHER SOFTWARE:</b>		
Operating Systems:	Windows Terminal Server 2014 R2	Windows Terminal Server 2019
.NET Framework:	Version 4.8	Version 4.8
Remote Control:	Microsoft Terminal Server; with VPN	Microsoft Terminal Server , or Citrix Metaframe; with VPN
Database:	Not required	Not required
Secure messaging:		HealthLink, Argus, Medical Objects

## Printers

### Document printer

Laser printers are required for all printed material.

Do not use Multi-Function-Printers (MFC) because if a fault occurs on any component of the device (eg scanner) it may mean that none of the functions are then available (eg printer).

Only good quality printers from major brands should be used. Our preferred brand is Hewlett Packard (HP) as they consistently perform well. With some brands we consistently come across problems with the printer drivers (Kyocera)

As we can print envelopes, plain A5, plain A4 or pre-printed A4 with letterhead you should have at least one main printer that has got multiple paper trays.

Speed	25 pages per minute (or faster)
Resolution	600 dpi (or greater)
Connection	Ethernet network
Bins	Manual feed + Std paper tray Large capacity bin recommended
Printer language	PCL or Postscript (not JetReady or PC compiled printer jobs)
Recommended printer	Hewlett Packard LaserJet

### Label printer

Labels can be printed either as a sheet or individually using a special label printer.

As you can create many different types of labels in the software we recommend the special label printer as there is less waste of unused labels.

Speed	16 labels per minute
Resolution	300 dpi
Label size	25mm x 98mm
Transfer type	Direct thermal transfer
Recommended printer	Dymo Labelwriter 400 or Brother QL570

### Colour Printers

Colour laser printers should not be used for purposes where a fast printing response is required eg printing receipts at reception, as most colour printer laser printers have a slow 'first page response' time. The delay is often around 20 seconds.

## Scanner

A purpose-built, TWAIN compliant, document scanner should be used as these are much more efficient on 'file size' and scanning speed than the common flat-bed scanner. It is recommended NOT to use scanners that are incorporated into photocopiers unless the manufacturers can guarantee the full functionality of all the specifications of their TWAIN driver. Contact Incisive for recommended high-speed scanners.

Scanning speed	40 pages per minute (simplex), 20 ppm duplex
Resolution	150 - 1200 dpi
File size	approx. 30 Kb per page
Feeder	Holds 50 sheets, A5 & A4 size, Duplex and colour capable. Fujitsu can detect if two or more pages are being fed at the same time.
Connection	USB or SCSI
Recommended scanner	Fujitsu fi-6110C, fi-6130C or Canon DR2510C



## Database

All Incisive products use Microsoft SQL Server as the database management system.

Express or Standard - Specialist Practice Manager, Private Hospital Manager, InforMED, CPD

The default database that is supplied with the Incisive products is Microsoft SQL Server 2016 Express. This edition of the program is free to use but it has some limitations. It is suitable for small to medium sized practices and hospitals. If the limitations are reached you will need to separately purchase licenses for the Standard (or other) edition of Microsoft SQL Server as they are not included in the Incisive product licenses.

Microsoft SQL Server 2016 is supported.

The 32bit or 64bit versions of the Database Engine are able to be used with Incisive applications.

Editions of Microsoft SQL Server 2016

	<b>Enterprise</b>	<b>Standard</b>	<b>Web</b>	<b>Express</b>
Maximum Database Size	524 PB	524 PB	524 PB	10 GB
Compute Capacity	OS Max	4 sockets or 24 cores	4 sockets or 16 cores	1 socket or 4 cores
Maximum Memory	OS Max	128 GB	64 GB	1 GB
Database Mirroring	✓	✓	✗	✗
Smart Backups, Encrypted Backups	✓	✓	✗	✗
SQL Profiler	✓	✓	✗	✗

### Installation & Configuration

It is not the responsibility of Incisive to install the database management system or ensure that it is configured for optimal performance. As many other applications also make use of the SQL Server it is important that the technician looking after your IT system is competent with the management of SQL Server.

SQL Server Management Studio must be installed on at least one computer – preferably the computer that Incisive has remote access to.

SQL Server Reporting Services or Analysis Services components are not required to be installed.

Advanced: For large databases, or systems where there is heavy disk access, the MDF and LDF files should be on separate physical drives. The MDF files should be in a RAID 1 or RAID10 array and the LDF files should be in a RAID1 or RAID10 array. In addition, you don't want any other disk activity on the array with the LDF files. Some advantage can be had by putting the TempDB onto a drive array with the same configuration as that provided to the LDF files

For requirements and recommendations on the installation and configuration of Microsoft SQL Server please contact Incisive Medical Systems.

## Firewall ports

SQL Server has specific requirements to allow connections through the server firewall

See <http://msdn.microsoft.com/en-us/library/cc646023.aspx>

Use PortQryV2.exe to test the ports. <http://support.microsoft.com/kb/832919>

## Backing up

It is not the responsibility of Incisive Medical Systems to provide, configure or ensure the running of a system that takes a copy of the database for back-up purposes. Note that the Express version of SQL Server does not include SQL Server Agent and therefore the backup process cannot be scheduled to run automatically. Third party tools are available to perform this task.

Scripts should be established to run queries that will truncate the transaction log file on a regular basis.

For larger practices or hospitals, the SQL server should be configured to allow for transaction log shipping to a standby server. The standby server may be a powerful workstation as it will also require a copy of SQL Server to be installed on it. Log shipping can occur on an hourly basis. New files in associated data directories, such as scandocs and images, also need to be transferred on a daily basis.

## Image files

Scanned documents and Image files are stored in the NTFS directory structure, with a record in the database that links to the file name and location.

For more than 100,000 files the drives should be specified for high speed access and retrieval eg 15,000 rpm SAAS drives.

Separate NAS or SAN drives are able to be used image files.

## Virtual environments

All Incisive applications perform as expected when installed in a virtual environment. However, if there is a choice, it is still our preference for installations to be performed on physical servers. From a support point-of-view, if there are performance issues, physical drive installations reduce the complexity of trying to determine what might be causing it.

It is our experience that the more physical memory available the better the whole virtual environment performs. If in doubt, add more.

## Anti-virus

Configure the anti-virus software on the workstations to exclude real-time scanning of the:

- files in the local \SPMWIN directory of the workstation (and server if used as Terminal Server)
- scanned document and image files on the server
- shared directory on the server
- database files on the server

Adhere to the recommendations from Microsoft regarding virus scanning on an SQL Server.

<http://support.microsoft.com/kb/309422/en-us>

## NOTES:

1. The **MINIMUM** specification is provided to indicate the requirements to allow Incisive applications to run. However slow performance, lock-ups and crashes may occur, particularly if other software is running.
2. The **PREFERRED** specification indicates the requirements to allow Incisive applications to run and perform at an optimum level, however higher specifications can be used, and may be needed, if other software is to be run simultaneously.
3. The specifications above may need to be increased if other software is running simultaneously or additional peripheral devices are installed.
  - anti-virus programs increase memory & CPU usage.
  - an additional 2 GB RAM should be added if using voice recognition (eg Dragon) software
  - printers, digital transcribers, smart-card readers etc. use additional memory
4. Laptop computers should have similar specifications to the 'Standalone' computer
5. Power Management features that will automatically put the computer into 'System standby' or 'Hibernation' mode must be disabled. Also disable the power saving function on the network card.
6. Hard disk size depends on the number of patient records, digital images, scanned documents and other unrelated data to be stored. Extra storage capability should be allowed for.
7. Hard disk speed of 7200 rpm is normally adequate but speeds of 10,000 rpm (or faster) improves retrieval of data for functions involving a lot of disk searching such as monthly statement runs.
8. Network protocols not being used should be removed. TCP/IP is the only protocol required
9. Turn off all non-essential graphical features.
10. Backup hardware and software is normally installed on the server but can be on any computer on the network as long as the backup hardware is shared to all workstations. Your Technical support office should install and check that the backups are working successfully and validate the restore process on a scheduled basis. It is recommended that backups be done on a daily basis, run overnight and a check put in place for successful completion. Incisive is not involved with backup services. The backup media should then be taken off-site by a security company.
11. An internet connection will be required for receiving and sending electronic lab results and documents as well as remote control support from Incisive Medical Systems. If you are faxing directly from an Incisive application you will need to have an account with GoFax for digital fax services.
12. SPM has been tested, and is supported on Microsoft, Windows Server 2016, Windows Server 2019, Windows 8.1 Professional & Windows 10 Professional. The application may run on earlier versions of the Windows operating system but is no Incisive development occurs and support may be withheld for Windows operating systems that are no longer supported by Microsoft.
13. All Incisive applications require Administrator account privileges when being installed. Editions of SPM & PHM that are published after May 2013 will run using the Standard User privileges
14. Microsoft Terminal Server (Remote Desktop) should be installed on a server dedicated for the purpose of serving thin-client connections. Microsoft SQL Server should NOT be installed on the same server
15. If possible, mail servers such as Microsoft Exchange should be installed onto a separate computer.
16. The computer/server that is hosting the database should not be used as a workstation as well. This can have a detrimental effect on the speed of the retrieval and delivery of data to the other workstations on the network. However, this may be unavoidable on a small network (< 3 computers).
17. Internet & email connections
  - A 'Virtual Private Network' (VPN) and 'Firewall' should be established if remote access to the server is required via an internet connection.
  - Updates for the Microsoft operating system and associated software should be downloaded and installed as they become available.
  - High quality virus checking and 'Anti-Spyware' software should be used and the associated definition updates installed as they become available.
  - Training and policies should be provided to ensure that staff do not access unsafe websites nor open email attachments from unknown senders