

Ultrasound Technical Questionnaire

These questions and acceptance testing guidelines were prepared by:

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If the vendor feels that an important feature of their system has been overlooked in this questionnaire, please attach a technical report describing the feature.

Vendor & System Names	
Vendor's name	
System model / name	
System's revision level	
Where is the system manufactured?	

Power requirements of the system	
What is the recommended line voltage?	Volts
How much power does the system draw?	Watts
Is an external line filter required or recommended?	

System weight (less options such as printer & VCR)	
kg	pounds

System's maximum dimensions	
Height	cm
Width	cm
Length	cm

Beam Former	
What is the maximum speed of the A-to-D converter?	MHz
What is the precision of the A-to-D converter, e.g. 12-bits?	bits
What is the maximum speed of the D-to-A converter?	MHz
What is the precision of the D-to-A converter, e.g. 12-bits?	bits
What is the maximum number of channels that can be active?	
Give the maximum number of channels per scan head (for 1D arrays)	
Give the number of active scan head ports.	

Are there separate ports for specialty probes? E.g. mechanical, CW pencil? Please list them.	
Does the beam former have other features you wish to describe in detail?	
If yes to the above, please attach a technical description.	

Out-of-plane focusing

Does the system support variable out-of-plane focusing, e.g. an active lens or 2D array?	
Is the out-of-plane focusing dynamically varied on receive?	
How is out-of-plane focusing achieved, e.g. 2-D array, dynamic lens?	Attach a technical description.
Which scan heads support this feature?	Attach a list.
Is there a separate connector(s) for these scan heads?	

B-Mode Images

What is the bit-depth of the greyscale image, e.g. 8-bit, 12-bit?	
If bit depth is greater than 8-bit, are window and level controls provided?	
Is an extended-field-of view method supported?	
Does image formation have other features you wish to describe in detail?	
If yes to the above, please attach a technical description.	

Video Monitor(s)

How many video monitors are there on the system?	
What is the monitor's type, e.g. Trinitron?	
What is the monitor's physical size?	
What is the pixel matrix size (resolution, e.g. 1024X768)	
What is the video scan rate?	Hz
Is the monitor interlaced or non-interlaced?	

Spectral Doppler

Is continuous wave (CW) Doppler available?	
Which scan heads support CW?	
Is pulsed spectral Doppler available on all scan heads?	
Please indicate which scan heads are not supported.	
What is the range of pulse repetition frequencies?	kHz
What is the range of sample volume lengths?	cm
What is the range of wall filters?	Hz

Is high pulse repetition frequency (to avoid aliasing at large depths) supported?	
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Flow Imaging	
Is colour Doppler available on all scan heads?	
Please indicate which scan heads are not supported.	
What is the range of pulse repetition frequencies?	
What is the range of sample volume lengths?	
What is the range of wall filters?	
Is there a flash-rejection filter?	
Is power Doppler supported on all scan heads?	
Please indicate which scan heads are not supported.	
Are there other modes of flow imaging, e.g. B-mode flow visualisation?	Please attach a technical description.

Harmonic Imaging	
Is harmonic B-mode imaging supported?	
Which scan heads are capable of harmonic imaging?	
For each scan head, which frequency ranges are used for transmit and receive?	
Can the system simultaneously acquire and display both harmonic and regular B-mode images?	
Is contrast agent harmonics supported?	
Which contrast agents can be used?	

Display modes	
Does the system have an A-mode display?	
Are coloured B-mode, M-mode & spectral Doppler available?	
Simultaneous B-mode & spectral Doppler?	
Simultaneous B-mode & colour Doppler?	
Simultaneous B-mode & M-mode?	
Simultaneous B-mode, spectral Doppler & colour Doppler?	
Simultaneous B-mode, M-mode & colour Doppler?	
Simultaneous B-mode, spectral Doppler & M-mode?	
Please list any other simultaneous modes.	

Three-Dimensional Ultrasound

Is 3D an option or is it a standard feature?	
What acquisition modes are available, e.g. sweep, sector, etc.	
What transducers are supported?	
What imaging modes can be acquired, e.g. B-mode, colour Doppler, power Doppler, harmonics?	
How is the scan head position determined?	
Is an external position indicator supported?	
What is the maximum data set size?	
What display/rendering modes are supported, e.g. texture map?	
What rotation and display manipulation tools are supported?	
For each rendering technique, what are the times to render the maximum and typical size data sets?	
Can the 3D data set be saved to a removable media disc?	

External Connectors

How many RGB video outputs are there?	
How many SVHS video output is there?	
How many RS-170 video outputs are there?	
How many NTSC video outputs are there?	
List any other connectors and give their purpose, e.g. RS-232 for service.	

Networking

Is DICOM supported?	
What are the DICOM options?	
What is the DICOM compatibility level?	Attach required documents.
What physical network connection is provided, e.g. RJ45?	
What is the network speed, e.g., 100 Mbps	Mbits per s
Are other network methods provided or available?	

Image Storage (Fixed)

Does the system contain a hard disc drive for image storage?	
What is the size of the hard disc drive?	Mbytes
How many greyscale images can be stored?	
How many colour Images can be stored?	
Can dynamic studies (Doppler & cine') be stored?	
What other types of information are saved to hard disc?	

Image Storage (Removable Media)	
Does the system contain a removable media drive for image storage?	
What type of drive is supported, e.g. optical, CD-R, DVD-R?	
What is the capacity of the discs?	
Which disc formats are supported, e.g. MS DOS, LINUX, Macintosh?	
How many greyscale images can be stored?	
How many colour Images can be stored?	
Can dynamic studies (Doppler & cine') be stored?	
What other types of information are saved to a disc?	
Which image formats can images can be stored as, e.g. DICOM and TIFF?	
Can images be transferred from the built-in hard drive to the removable disc?	
Can images be saved directly to the removable disc, i.e., without saving to the hard disc?	

Ergonomics	
Does the monitor swivel?	
Does the monitor tilt?	
Does the monitor move in any other directions?	
Does the console move up and down?	
Does the console move in any other directions?	

Configuration	
How many factory-defined presets are available?	
How many user-defined presets are available?	
Can one set defaults for new patients such as power level?	
Is there an automatic configuration that is based on current image data rather than on presets?	

Scan heads	
For each scan head that is quoted please answer the following.	
What is the model number of the scan head?	
What type is the scan head, e.g. linear array, phased array?	
What is the nominal frequency of the scan head?	MHz
What is the frequency range of the scan head?	MHz
Can the scan head can be operated at different frequencies in B-mode?	

Which frequencies?	
What is the number of channels?	
What is the width of the active surface?	cm
What is the out-of-plane focal distance?	cm
What is the maximum sector angle?	degrees
What is the approximate weight of the scan head?	grams

Quality Assurance

Does the system supply software for routine quality assurance?	
Are there any options regarding QA/QC software?	
Which QA phantoms are supplied?	