

## HI VISION Preirus

A compact premium ultrasound platform that adapts to your environment







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Are you tall or short? Do you sit or stand? Are you performing a routine examination or a complex interventional procedure?

Whatever the situation, HI VISION Preirus adapts to your environment and makes you feel more comfortable in your diagnosis.

Since introducing the first real-time ultrasound machine with digital scan converter in 1980, Hitachi has developed a rich technological expertise which now delivers the HI VISION Preirus – a new generation ultrasound platform with advanced ergonomic architectural design, the latest broadband beam-forming technology and ultrahigh-speed processing capability.



Hitachi Medical Systems Europe is the European headquarters of Hitachi Medical Corporation whose corporate head offices are located in Tokyo, Japan; a company renowned for technological innovation. Our broad experience and expertise in ultrasound imaging makes us a recognized leader in this field, meeting the latest design and quality standards, combined with outstanding image quality and advanced clinical applications.

# HI VISION Preirus – Advanced Product Features

Discover new dimensions in ergonomic design – increased machine flexibility means it does the twisting and turning, so you don't have to.

## Ergonomic Design

The unique design of the HI VISION Preirus platform allows precise adjustment to facilitate the performance of any examination by any operator. With its super slim-line footprint, and operator console with large digital LCD viewing monitor moving together in a rotational arc, positioning at the bedside can be optimised to make diagnosis a more comfortable experience for you and your patient.

## Second Generation Graphical User Interface with Smart Touch Technology

By integrating the system's operator controls on a 19" digital LCD monitor using a series of Touch Panel keys and Smart Tab menus, the HI VISION Preirus allows intuitive scan parameter adjustment without having to reduce concentration on the diagnostic image. A thumbnail image gallery displays current and stored images for easy comparison. Opening of menus and toolbars, including access to a user manual, is controlled by the operator leaving a full-screen, uncluttered image display for maximum diagnostic capability.





# HI VISION Preirus – HI VISION Imaging

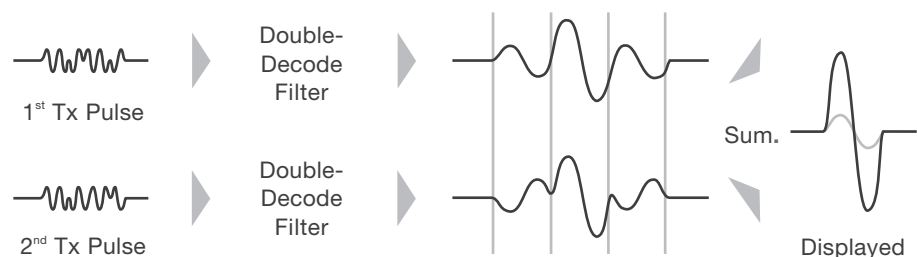
The art of effective imaging – customised scanning parameters combined with high speed image processing for improved diagnostic confidence. Proven innovative technologies confer superior penetration, temporal, spatial and contrast resolution giving high quality images for every patient every time.

## Patient Scanning Selector (PSS)

Detailed adjustment of all imaging parameters is essential to optimise diagnostic capability for each anatomical area and for each individual patient. The Patient Scanning Selector (PSS) gives flexibility within a chosen clinical application to customise, save and later recall examination specific combinations of imaging parameters at the touch of a button.

## Advanced Imaging Technology

Ultrahigh-speed image processing on the HI VISION Preirus platform enhances the performance of established image quality improvement technologies such as HI Rez+ (tissue adaptive filtering), HdTHI (High definition dynamic Tissue Harmonic Imaging), HI Com (frequency and spatial compounding), and Coded Imaging. Flexible pitch scanning using a new proprietary ASIC gives the operator more control over frame rate and line density resulting in faster frame rates and maintained high quality B-mode imaging even in Colour Doppler and Elastography (HI-RTE) modes.



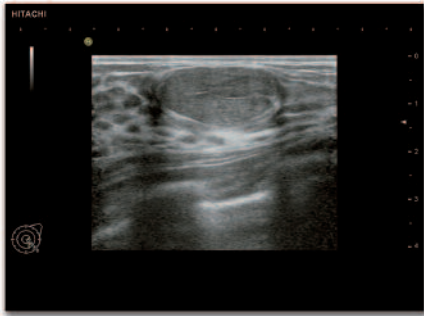
Coded Imaging

## New image formats – Imaging outside the box

Examinations of superficial structures using high frequency linear array transducers are transformed using a new trapezoid display format to 'image outside the box' – expanded field of view for B-mode and Colour Doppler imaging, and a steering B-mode option to optimise beam-to-vessel angle, enhance anatomical and vascular display. High resolution zoom (HI Zoom) and image magnification (Pan Zoom) functions are available at the touch of a button for optimisation of line density and frozen image size adjustment, respectively.

## Patient Dependent Correction (PDC)

The HI VISION Preirus platform recognises that patients are not all the same – Patient Dependent Correction (PDC) allows you to make adjustments to the assumed speed of sound in soft tissue for every individual, resulting in improved spatial and contrast resolution to give high quality images in all patients all of the time.



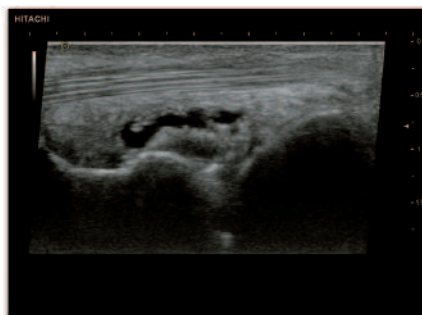
With HI VISION Imaging, this large phylloides tumour is superbly contrasted against the glandular breast tissue.

This haemangioma of the liver is clearly differentiated and the through-transmission identified by combining HdTHI, HI Rez+ and HI Com on the abdominal transducer.



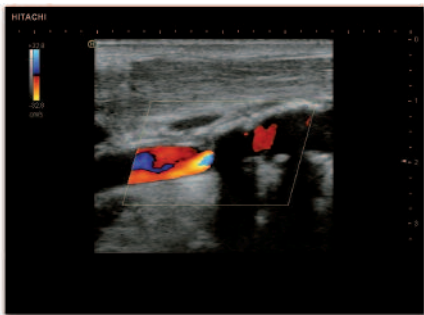
The trapezoidal image format is used to show the full length of the thyroid lobe containing an adenomatous goitre. The vascularity is displayed with exceptional spatial resolution using Fine Flow.

Detailed visualisation of the anterior placenta with the fetal profile in this 15 week pregnancy is possible using a trans-abdominal approach.



The heterogeneous appearance of the uterine myometrium and clear differentiation of the endometrium is seen with the endovaginal transducer.

B-steer is used to better delineate the borders of the ganglion seen underlying the tendon in the wrist.



The high velocity jet emerging from a tight stenosis and the pattern of turbulent flow in the internal carotid artery is beautifully illustrated in colour flow mode.

Spontaneous flow within the jugular vein and the common carotid artery together with the precise outline of the plaque demonstrate the power of HI VISION Imaging.

# HI VISION Preirus – Advanced Modalities

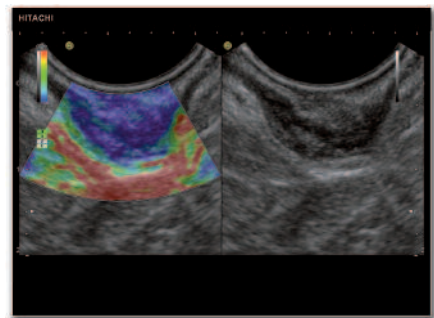
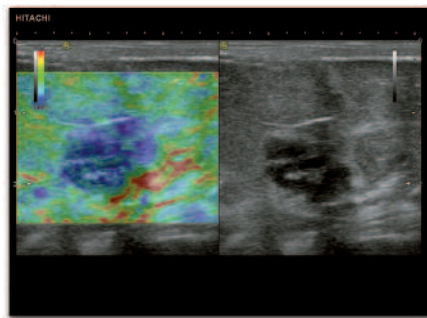
Incorporating the latest technological advances the HI VISION Preirus delivers state-of-the-art ultrasound capability giving you improved examination value from raised diagnostic confidence and increased potential for therapeutic intervention.



## Hitachi Real-time Tissue Elastography (HI-RTE)\*

HI-RTE has proven clinical benefits in a variety of different applications – breast, prostate, pancreas & lymph nodes , thyroid, musculoskeletal, liver and many more. With the ability to improve focal lesion visualisation and refine a differential diagnosis in real-time using any one of 25 transducers, clinical studies evidence that the technique is accurate, reproducible and easy to perform. HI-RTE is rapidly becoming an essential part of the routine clinical ultrasound examination.

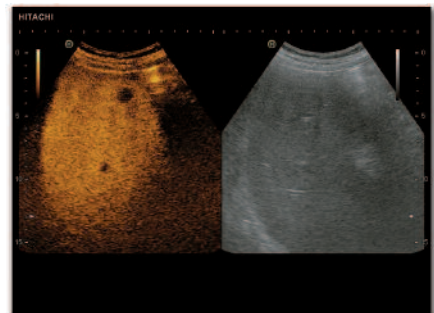
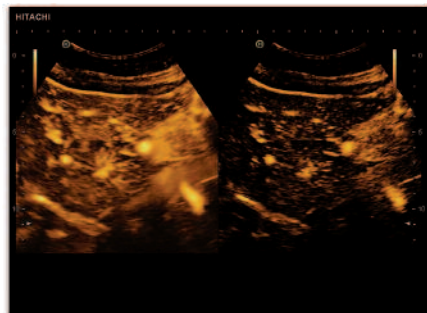
HI-RTE demonstrates the full extent of the increased stiffness associated with this breast carcinoma.  
 HI-RTE is also available on the full range of echo endoscopes. Here the malignant nature of a pancreatic tumour is shown with the linear scope.



## Dynamic Contrast Harmonic Imaging (dCHI)\*

Dynamic Contrast Harmonic Imaging (dCHI) is a wideband pulse-inversion (WPI) technology developed by Hitachi for use with ultrasound contrast agents. We give you increased agent-to-tissue specificity by modulation of both pulse phase and the transmit frequency between pulses - you notice significant improvement in lateral and contrast resolution and greater sensitivity at depth with no compromise in axial resolution. Using the Microbubble Trace Imaging (MTI) accumulative enhancement mode you benefit from an improved ability to interrogate micro-vessel morphology and by generating Time Intensity Curves (TIC) from stored data you can display contrast agent enhancement over time within multiple selectable regions of interest (ROI).

Microbubble Trace Imaging mode is used to show the characteristic stellate vascular pattern in this example of focal nodular hyperplasia.  
 Small metastases are shown with clarity in the dCHI mode in this extremely technically difficult patient.



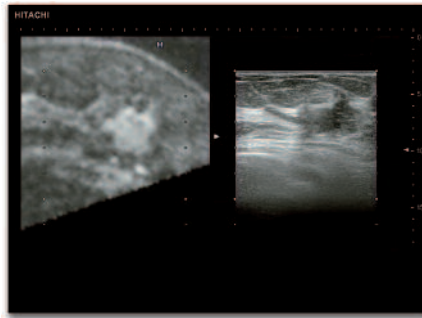
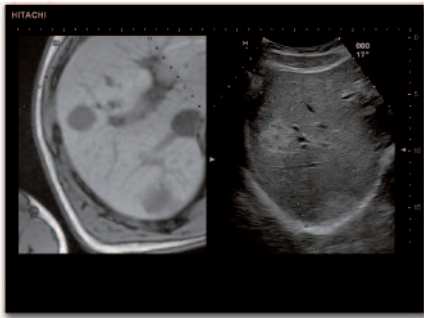
\*Optional



## Real-time Virtual Sonography (RVS)\* – the intelligent fusion of ultrasound and CT/MR imaging

Hitachi's Real-time Virtual Sonography (RVS) enables the simultaneous real-time display of a free-hand ultrasound image together with the corresponding multi-planar reconstructed (MPR) image from a CT or MR volume data set. With the ability to load multiple phases of a CT examination simultaneously, this innovative technology gives a better understanding of ultrasound anatomy and allows direct comparison of lesion characteristics using different imaging modalities.

RVS improves accuracy of needle placement allowing more precise monitoring of interventional procedures without additional radiation exposure. RVS can be activated with abdominal, dedicated biopsy or high frequency linear transducers. Offering superior lesion targeting and needle guidance, RVS makes interventional procedures in the abdomen and more superficial organs such as the breast, easier to perform and safer for patients.



- Real-time guidance of the needle placement and monitoring of the interventional procedure is supported by the virtual CT slice.
- Visualisation of the intraductal extension of this breast carcinoma is compared between the real-time ultrasound image and a previously acquired MR data set.



\*Optional

# Advanced Transducer Technology across a Range of Applications

Hitachi earned a place in history by introducing the first curved linear array in 1980. Today, Hitachi still manufactures the majority of its transducers in-house and is at the leading edge of transducer materials research and cable design.

Hitachi's 'in-house manufacture' expertise has allowed us to customise and optimise transducer performance for each clinical application by using the most appropriate design features. For example, our super multi-layer technology gives you high signal-to-noise ratios at depth in the abdomen whilst micro piezo-composite technology is used to reduce interference and improve signal-to-noise ratio when imaging superficial structures with high frequency linear transducers.

The HI VISION imaging achieved with dedicated 4D transducers matches that of the standard 2D transducers and the lightweight ergonomic design features minimise operator fatigue.

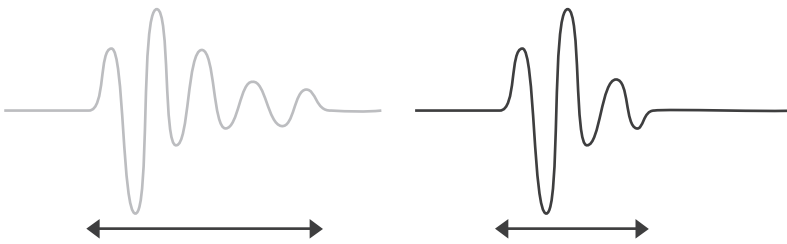
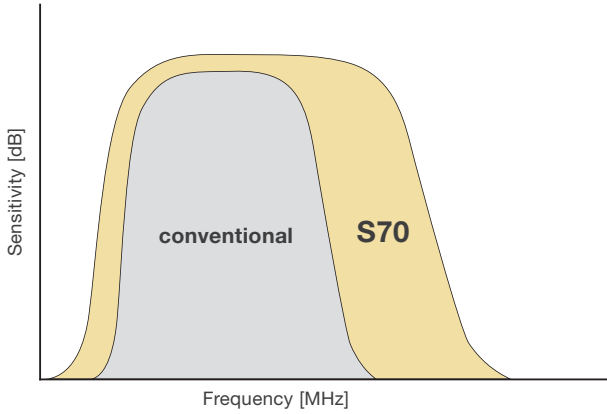
## Biopsy Guidance

Hitachi offers outstanding technological support for interventional diagnostic and therapeutic procedures with a choice of dedicated transducers for biopsy, attachments for performing biopsy with standard transducers and integrated working channels for endoscopes. Advanced image acquisition and display features such as Real-time BiPlane Imaging (RTBi) and Real-time Virtual Sonography (RVS) enable you to realise the potential of ultrasound for safe, accurate, non-operative diagnosis and minimally invasive therapeutic interventions.

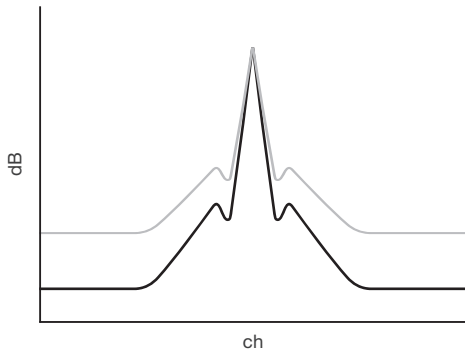


## Single Crystal Transducer Technology

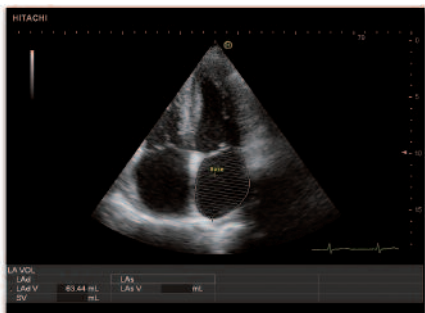
With the HI VISION Preirus ultrasound platform, Hitachi introduces state-of-the-art single crystal technology in its new EUP-S70 phased array transducer. Precision element slicing delivers markedly improved stability and energy efficiency giving you higher quality B-mode images and increased Doppler sensitivity for improved diagnostic confidence.



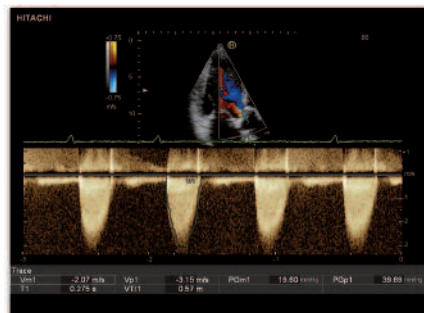
Increased frequency bandwidths and a short ring down translates into improved axial resolution.



A decrease in cross-talk improves signal to noise.  
The EUP-S70 phased array transducer with lightweight, low-capacitance cable.



An apical 4-chamber view showing automatic calculation of the left atrial volume.



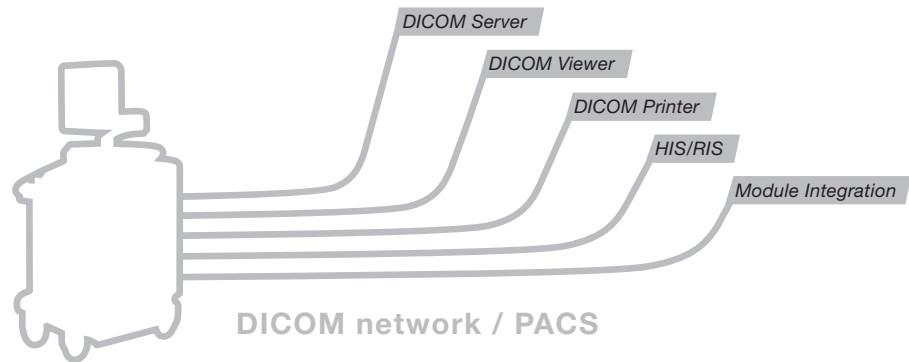
An apical long axis view where the degree of aortic stenosis has been estimated from analysis of the CW spectrum.

# HI VISION Preirus – Safe and Efficient Patient Data Interfacing

Intelligent software solutions and universal connectivity for improved workflow – maximising patient throughputs : minimising operator effort.

## Network connectivity

Full DICOM connectivity allows you to interface with PACS and other image and information management systems, providing integrated worklist, storage, query/retrieve and print functionality. Structured report options expedite examination completion and encourage standardised reporting practice.



## Intelligent patient administration – gives you smart access to patient data as and when required

At the start of each 'new patient' previous examination entries can be reviewed for corresponding records and matching patient information automatically populated into relevant data fields.

Prospective worklist entry capability allows rapid patient identification and selection at the start of each examination and ensures accurate and consistent patient records. Flexible interrogation software enables you to search the image database using patient name, date of study or keywords. 'Image Viewer' software allows you to retrieve stored images and measurements for offline review to facilitate image interpretation and examination reporting.

## Data Transfer

Versatile image software enables external transfer of images to USB memory devices (multiple ports), USB hard disk drives, DVD-R or DVD-RAM in DICOM, BMP, TIFF or AVI format. The ability to mask patient identification on transfer ensures compliance with data protection protocols and assures patient confidentiality when using images for research, training and education.



## Hitachi Medical Systems – Values and Services

Hitachi Medical Systems combines high technology with the Asian tradition of long-term thinking, a high level of consciousness for quality aspects and the subsequent understanding of service.

In building valuable, long-term relationships with our customers, we have achieved an understanding of their different needs and expectations. This has strengthened our commitment to deliver high-quality products which fulfil the requirements of each unique clinical speciality.

We provide a one-to-one service to secure first-class customer satisfaction. The close working relationships among sales, applications and many other key members of Hitachi Medical Systems guarantee appropriate reactions and fast responses.

We always endeavour to 'go the extra mile'. We succeed because we welcome new ideas, products and services.

Services such as our 360° educational programme, the Hitachi Medical Systems Technology Academy, offering tailor-made, added-value services and solutions for professionals in all fields of medicine and other interested groups.



We abide by our corporate philosophy believing that we have a social responsibility to protect our environment, so that the next generation has a firm grounding on which to build a secure future.

# HI VISION Preirus – Specifications

## 1 Clinical Applications

Abdominal  
 Paediatrics/Neonatal transfontanelle  
 Small parts (breast, thyroid, testes, etc)  
 Musculoskeletal  
 Obstetrics/Gynecology  
 Gastroenterology  
 Urology  
 Rectal  
 Adult and paediatric cardiology (as option) including transoesophageal  
 Vascular  
 Transcranial  
 Interventional Ultrasound  
 Intraoperative

## 2 Advanced Imaging Capabilities

HI VISION imaging:

- dynamic Tissue Harmonic Imaging
- High Definition dynamic Tissue Harmonic Imaging
- HI Com: real time image compounding
- HI Rez+: real-time tissue adaptive filter
- Coded Imaging
- HI Zoom

HI Support B and PW Doppler auto-optimisation  
 dynamic Contrast Harmonic Imaging  
 Tissue Doppler Imaging (TDI) Mode  
 Panoramic Imaging (WideView)  
 Hitachi Real-time Tissue Elastography (HI-RTE)  
 Real-time Virtual Sonography (RVS)  
 3D and Realtime 3D imaging  
 Real-time Bi-Plane Imaging  
 Picture-in-picture  
 Dual Gate Doppler

## 3 Advanced Measurement Package

% WT measurement  
 Colour tissue tracking  
 IMT measurement  
 M-mode navigation  
 Real-time Doppler AutoTrace

## 4 Special Features

Unique movement of operator console and 19" digital LCD in a rotational arc  
 Sideways rotation of operator console through 55°  
 Graphical User Interface incorporating Smart Touch panels, Smart Tab menus, Image Thumbnails  
 Independent swivel/locks on all four wheels  
 Waterproof remote control operation  
 Voice-activated Bluetooth operation

Digital storage:

- Hard disk, DVD-RAM, DVD-R, USB memory device and USB HDD (Up to 5 ports)
- External PC or Mac via LAN Ethernet 100

Image Format:

- BMP, TIFF, JPEG, DICOM

Cineloop Format:

- AVI, DICOM JPEG, up to 4 hours continuous recording in MPEG2 format

DICOM 3:

- Store, Print, Worklist, Query/Retrieve, Structured Report (OB, Cardiology, Vascular)

## 5 Power Requirements

Power supply: · AC 220 – 240 V (+/- 10%)  
 Power consumption: · 1.5 kVA  
 Dimensions: · 450mm (width) x 900-1110mm (depth) x 1350-1550mm (height)

## 6 Standards

Conforms to ISO 9001: design, fabrication, distribution  
 Conforms to ISO 14001: environmental protection



## HI VISION Preirus

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Hitachi Medical Corporation, Medical Systems Operating Group, is certified as complying with the International Standard of System Quality Assurance (ISO 9001), Medical Device Special Requirements (ISO 13485) and etc.

Hitachi Medical Corporation, Medical Systems Operating Group, has been certified to ISO 14001 (Environmental Management Systems).

Specifications and physical appearance may be changed without prior notice in order to improve performance. Some features described are optional. Please read instruction manual to ensure correct operation of the equipment.

