



HI VISION 900 – a premium class ultrasound platform

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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. Please read instruction manual to ensure correct operation of the equipment.



HV 900 | e | 10.2007 | a+w

HI VISION 900

A Premium Class Ultrasound Platform





HI VISION 900 – a premium class ultrasound platform

Hitachi Medical Systems presents HI VISION 900, the ergonomically designed ultrasound platform with superior image processing and advanced applications.



Hitachi Medical Systems is a division of Hitachi Ltd., headquartered 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. The HV 900 is the highest performing platform and the latest addition to the Hitachi range.

HI VISION 900 – Advanced Product Features

Through ergonomical design and outstanding performance the HV 900 guarantees maximum freedom and flexibility.

Disproportionately high musculoskeletal disorder incidence rates in the medical ultrasound community have motivated us to design a state-of-the-art platform that permits maximum rotation and adjustability of the monitor and user interface.

In addition, a new generation graphical user interface allows the operator to control the examination from the monitor and trackball; and options such as a handheld infra-red remote control, speech recognition software and picture-in-picture help you to create a safe working environment, whatever the demands of the clinical examination.



Ultrasound Cockpit

The HV900 features Hitachi's Ultrasound Cockpit. With this new graphical user interface all the controls are arranged in front of the user like a cockpit. Stored images are displayed in thumbnail format and a "compare window" enables users to compare current images with images of the same patient from a previous study.



Detail of vertical toolbar: selection of probe/application, and simplified image transfer.

For those more comfortable with a "point and click" PC interface, all operating functions and controls are accessible as icons.

Infrared Remote Control*

Lightweight yet fully featured for comprehensive system control no matter what the clinical need. An innovative watertight design allows for easy cleaning for use in any environment, including sterile fields.

Voice-activated Bluetooth Operation*

Command and control with voice recognition via Bluetooth headset allows total focus on the patient and procedure. The need to move the system in order to avoid potentially harmful operator positioning is eliminated.



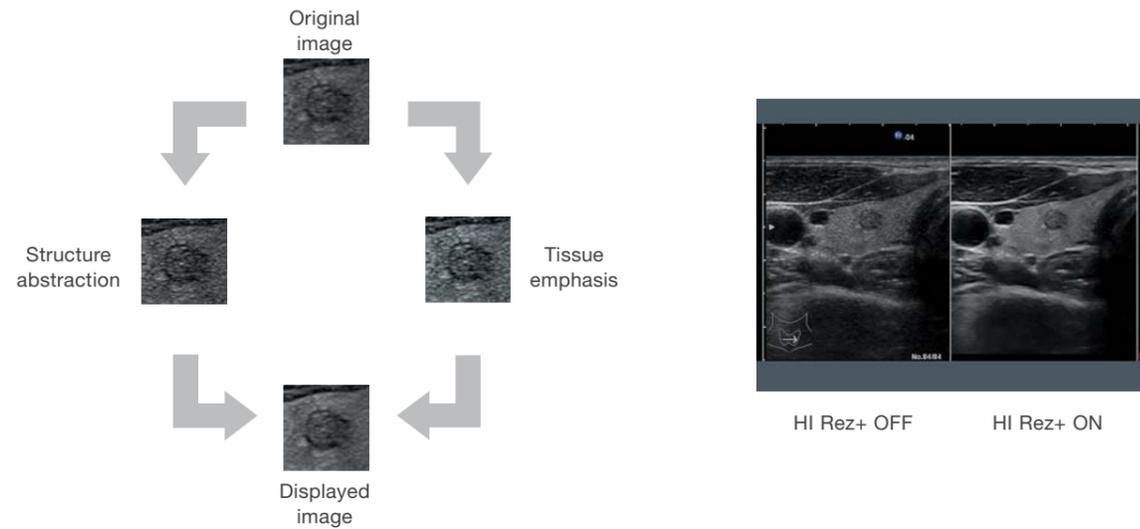
* Optional

HI VISION 900 – HI Vision Imaging

HI VISION 900 combines state-of-the-art technologies to provide unmatched image quality across all clinical applications.

HI Rez+

This high resolution tissue adaptive filtering technique performs tens of thousands of spatial imaging processing operations in real time using a dedicated high speed ASIC calculator and ultra-high speed algorithm. Real tissue echoes are enhanced and given a more uniform appearance whilst noise and clutter are significantly reduced even in the most difficult-to-image patients.



HI Com

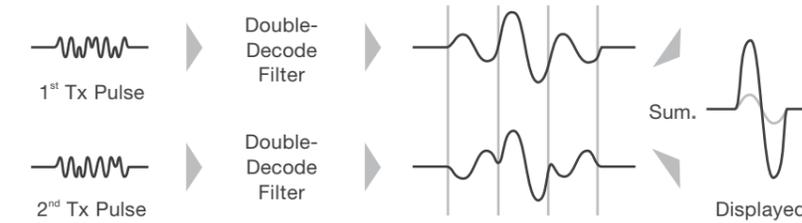
Both frequency and spatial compounding techniques are combined with HI Compound imaging, resulting in exceptional contrast and detail resolution with improved visualisation of interfaces and organ boundaries, allowing greater diagnostic confidence.

High Definition dynamic Tissue Harmonic Imaging (HdTHI)

Thanks to the improvement in Hitachi's broadband technology, the non-linear receive components induced by the wideband transmit pulse include low frequency sub-harmonic signals in addition to the second harmonic frequencies. Improved resolution and penetration is achieved over conventional pulse inversion technology.

Coded Scanning

Increased penetration whilst maintaining spatial resolution is achieved by using a proprietary coded transmitted pulse sequence and a double-decoding of the echoes into a short, high amplitude pulse on receive, resulting in improved sensitivity for high frequency imaging.



HI Vision imaging – a combination of HI Com, HdTHI, and HI Rez+ – is used to perfectly delineate this small fibroadenoma in the left breast.

The uniform texture and smooth borders of the spleen are contrasted against the echo-free ascites in this patient with progressive cholangiocarcinoma.

Even very small fluid collections can be detected with HI Vision Imaging, as seen in this shoulder joint in a patient with a subacromial bursa.

High frequency imaging and state-of-the-art signal processing are combined to show the normal testicular anatomy in a patient with a hydrocele.

HI Vision Imaging provides the contrast resolution to clearly differentiate between the normal pancreas, liver and the large abscess seen in the left liver lobe.

A thickened gallbladder wall is seen with exceptional clarity in this patient with systemic venous congestion.

Hitachi's 7-Series Transducers

Few advances in ultrasound imaging can be attributed to system hardware alone. Advances in transducer technology go hand-in-hand with innovations in signal processing. Each 7-series probe is designed for high performance across all operating frequencies.



HI VISION 900 – Advanced Modalities

The pace of innovation is accelerating. Experience guides us in the development of technologies for the future. The HV 900 platform offers new innovative modalities that can provide additional clinical information today.

Hitachi Real-time Tissue Elastography (HI-RTE)* – the new modality for the assessment of tissue elasticity

By offering additional information about the stiffness of tissues, Hitachi's proprietary technique improves the visualisation of tumours and improves the differentiation between benign and malignant disease. In breast applications, HI-RTE has a complementary diagnostic role to the conventional B-mode, increasing the specificity by adding new benign criteria and thereby eliminating unnecessary diagnostic procedures.

Increased stiffness is seen within the lesion and in the surrounding tissue in this invasive ductal carcinoma of the right breast.

A low measurement of the strain ratio is obtained in this benign breast fibroadenoma.

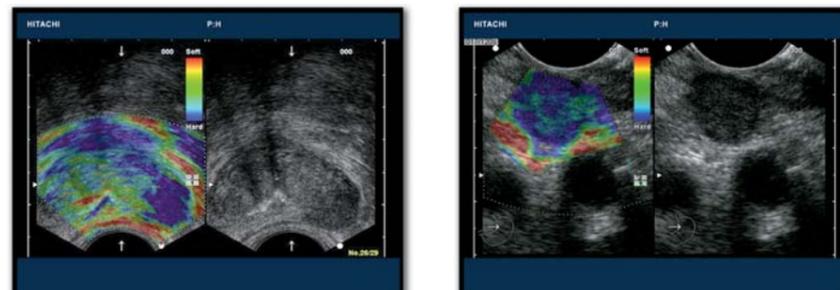


This 2nd generation real-time elastography includes the strain ratio measurement, providing an objective evaluation of strain within a lesion compared to the normal surrounding tissues for further research into tissue characterisation.

HI-RTE is available for a wide variety of transducers and its diagnostic value has been proven for many clinical applications:

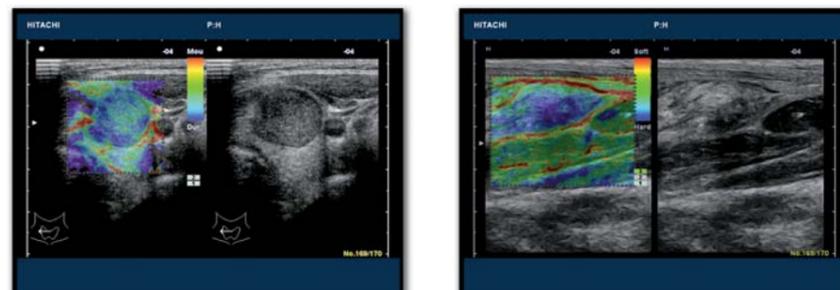
Mid-section of the prostate gland using the endocavity transducer showing a carcinoma, Gleason score 6, in the peripheral zone.

Significant increase in stiffness is seen in the elastography image of a malignant lymph node using an endoscopic ultrasound approach.



Follicular carcinoma in the left thyroid lobe visualised with a high frequency linear transducer.

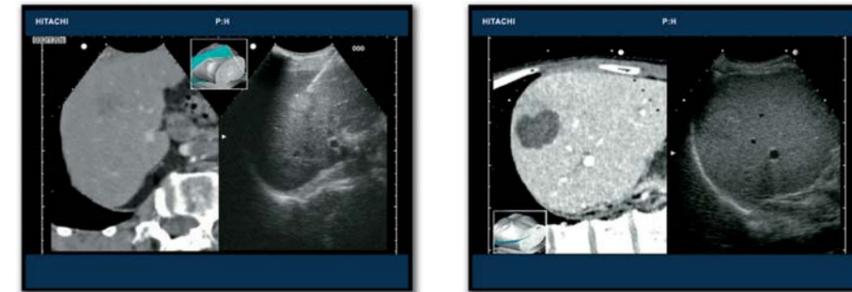
Demonstration with the linear transducer of a partial tear in the left pectoral muscle.



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

Hitachi's Real-time Virtual Sonography enables the simultaneous real time display of a free-hand ultrasound image together with the corresponding multiplanar reconstructed (MPR) view from the pre-operative CT or MR volume data set.

This innovative imaging technology gives a better understanding of the ultrasound imaging anatomy, provides a direct comparison of lesions using different imaging modalities, more accurate needle placement for interventional procedures, and more precise monitoring of interventional procedures without additional radiation exposure.



Real-time guidance of needle placement using RVS prior to a radio frequency ablation procedure of a liver lesion.

An isoechoic liver lesion, poorly visualised on the ultrasound image but well demonstrated on the corresponding virtual MPR view from the CT data.



Real-time Virtual Sonography protocol

* Optional

HI VISION 900 – Advanced Specialist Technologies

HI VISION 900 offers outstanding technological support for interventional diagnostic and therapeutic procedures.

The development of minimally invasive therapies has relied heavily on accurate image guidance for the percutaneous placement of needle-type applicators. Real-time Virtual Sonography is a unique and effective method to support safer and more accurate guidance and monitoring of radio frequency ablation procedures.

Real-time BiPlane imaging (RTBi)

With this technology, two probes can be used and their real-time images displayed simultaneously, allowing the user to visualize the target from multiple angles so that biopsies and interventional therapies can be performed with the utmost precision.

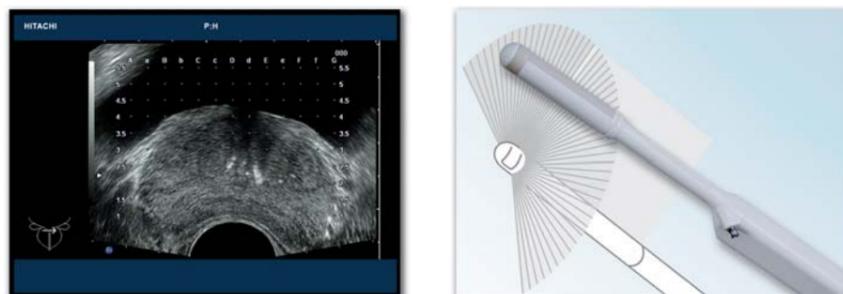
Demonstration of the simultaneous use of two transducers offering complete monitoring of both the needle placement and progress of therapeutic liver treatment from two different scan planes.



Brachytherapy

High resolution transrectal Bi-Plane imaging combined with colour Doppler for accurate visualisation of the surrounding vessels ensures accurate volumetric measurements and precise seed or needle placement in brachytherapy and cryotherapy treatments. Compatible with standard stepping devices, templates and radiotherapy planning software.

Transverse section of the prostate using the convex half of the Bi-Plane transducer with overlying brachytherapy grid for precise seed loading and positioning.



Endoscopic Ultrasound

Color Doppler, tissue harmonics, 3D, and Real-time Tissue Elastography are a few of the advanced features available, whether you choose the linear therapeutic or the world's first electronic radial endoscopic ultrasound transducer. In addition, it is possible to display the endoscopic and ultrasound images simultaneously in real-time on the ultrasound system (Picture-in-Picture), improving operator comfort.



Picture-in-Picture: endoscopic view of a polyp. The corresponding EUS image shows it to be clearly confined to the mucosa.

Laparoscopic Ultrasound

A revolutionary laparoscopic ultrasound transducer with multi-frequency capabilities for accurate delineation of the anatomy and precise needle placement during therapeutic procedures. The flexible tip of the transducer is omni-directional and can be angulated and adjusted for optimal coupling. Integrated Colour and PW Doppler offers complete vascular mapping and quantification of blood flow. The probe design ensures efficient and thorough sterilization in accordance with statutory guidelines.



A 12 mm liver metastasis in a patient with gastric cancer visualised pre-operatively with the laparoscopic probe.

Hitachi has a unique range of dedicated biopsy, intraoperative and laparoscopic transducers. In addition, biopsy brackets are available for most standard imaging transducers.





HI VISION 900 – Featuring great technical benefits

Information Technology has become more and more important in the medical field. Hitachi's competence in this field is well known.

Image management

Flexible solutions ensure fidelity and security of patient data and image storage.

- **Real-time Archiving**
B-mode, M-mode and Doppler clips can all be stored to the system hard drive
- **Digital filing system**
A DVD multi drive and USB memory are supported for easy image archive. Additionally, to protect patient's confidentiality, it is possible to mask the patient's name and ID when exporting images for educational purposes

The Ultrasound Image Viewer

Hitachi offers a software solution for image management and off-line measurements. With the Ultrasound Image Viewer software and a PC, it is possible to retrieve stored images via a network, perform measurements, and generate customised reports. This software is easy to use, offering a display that mimics the ultrasound system.



Network connectivity

Full DICOM connectivity allows you to interface with PACS and other image management systems providing worklist, storage, query/retrieve and print options.

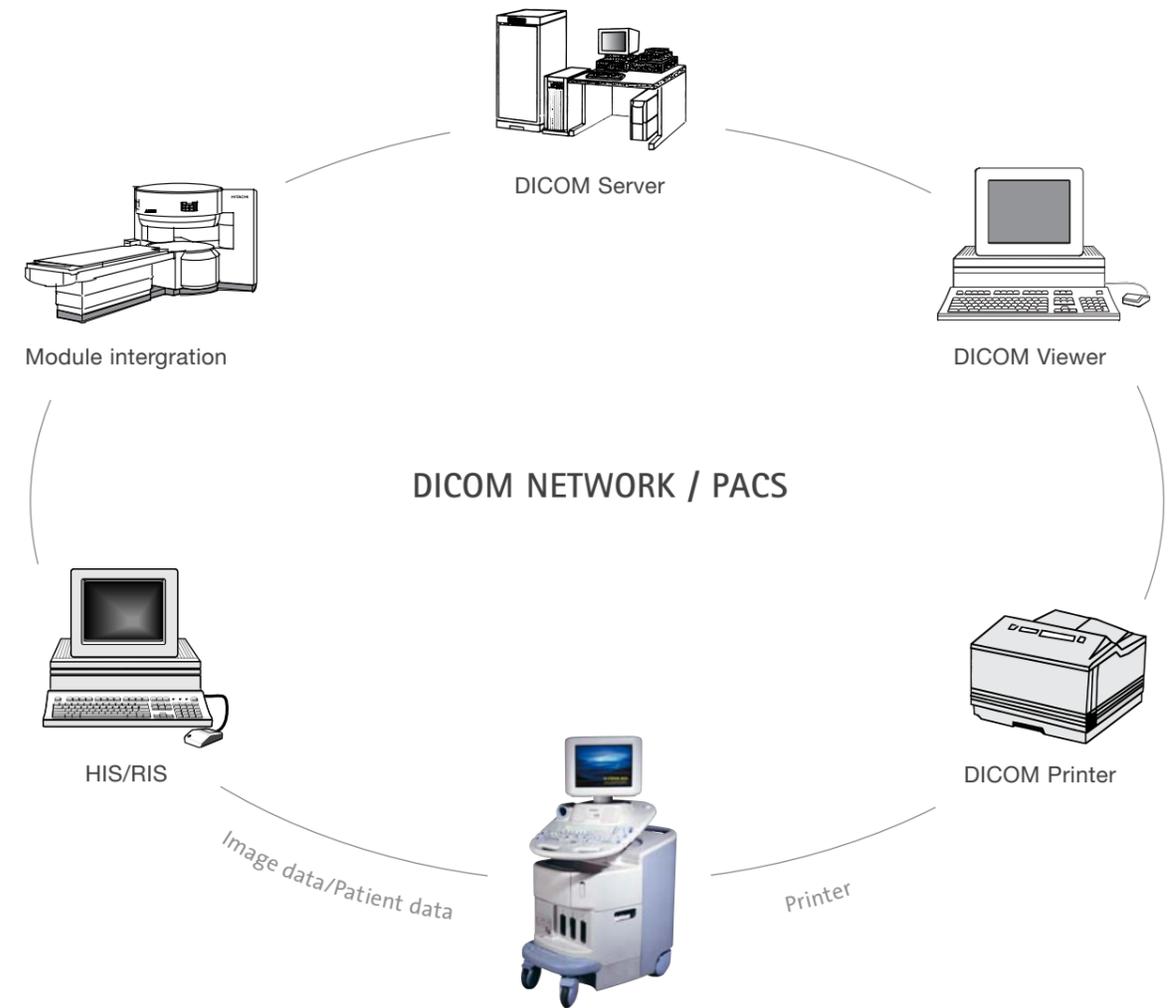


Image review full screen, 4, 9, or 16 image display mode

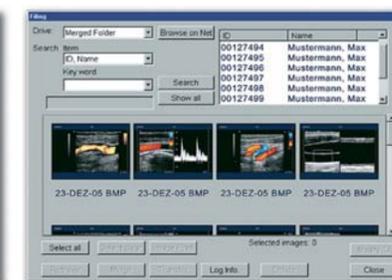
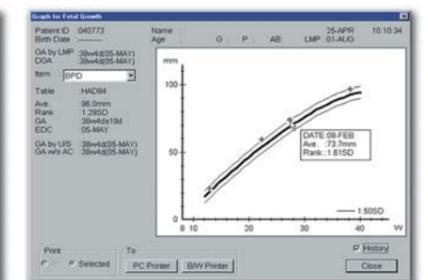


Image and patient database display mode



Patient data