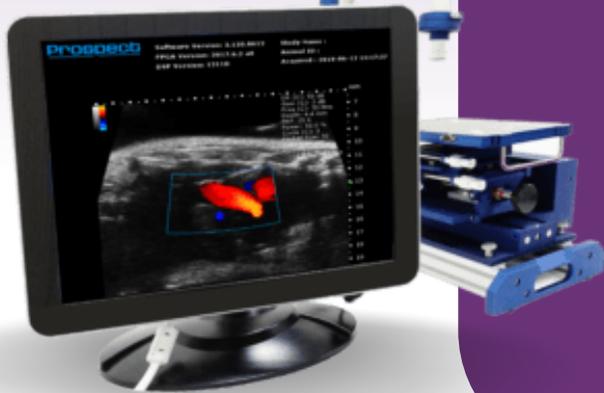




Prospect T1

High-frequency
Ultrasound



- Specifically designed for preclinical imaging applications on small animals
- Compact tablet design with easy-to-use animal handling platform

Scintica:

#S-Sharp

Prospect T1 System Configurations



Probe Specifications

PB207e

- 20MHz probe
(broadband 10-30MHz)

PB406e

- 40MHz probe
(broadband 20-50MHz)

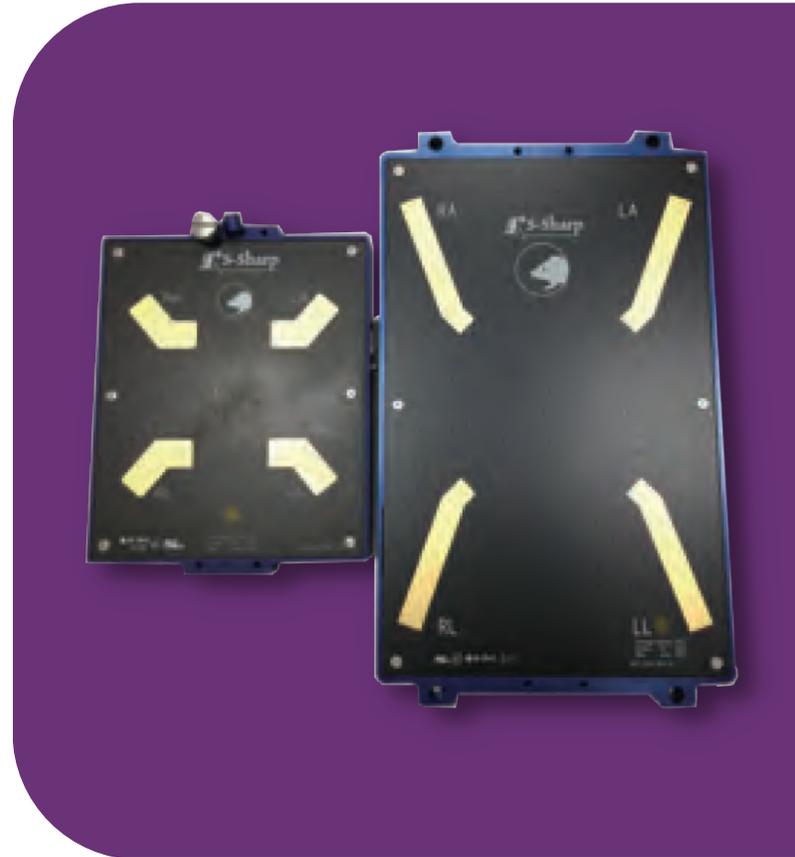
PB506e

- 50MHz probe
(broadband 30-60MHz)

Prospect T1 System Configurations

Animal Beds

- Two options available, sized for mouse or rat.
- Provide heat to the animal to support normal physiological parameters
- Integration of anesthesia nose cone
- Monitoring of body temperature, respiratory rate, ECG, and heart rate
- ECG and respiratory signals may be exported



Add-Ons Available

- 3D motor for volume imaging
- Image guided needle injection
- Shear wave elastography imaging
- Integration of sonoporation probe

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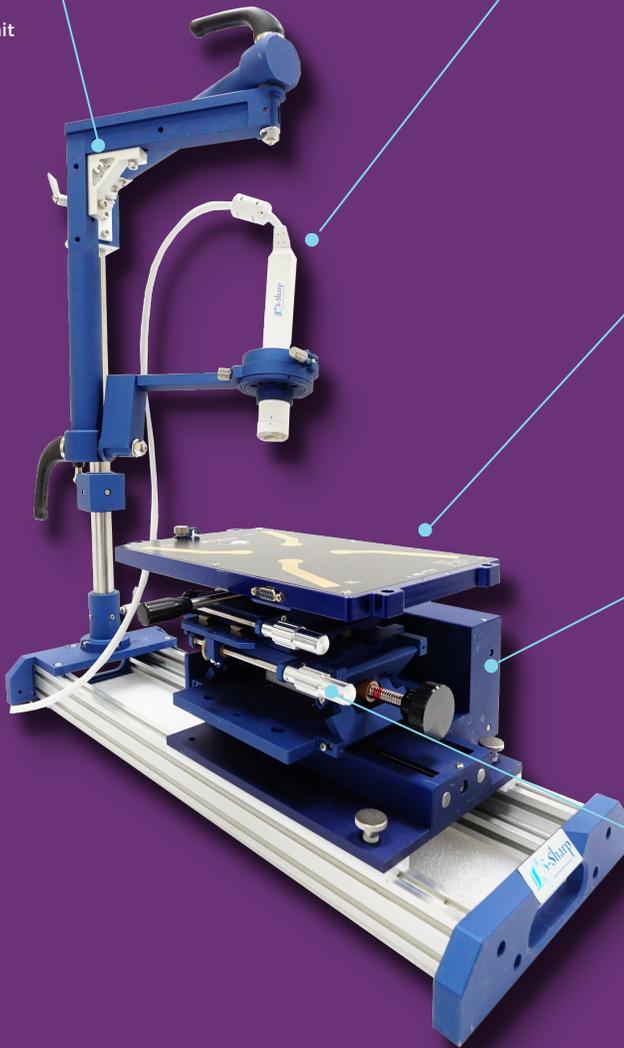


Add-Ons Available

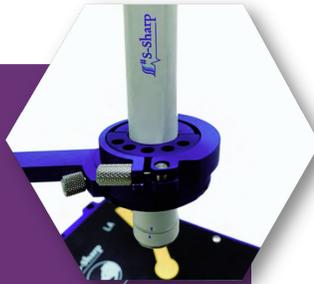
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Easy to Use Animal Handling Platform

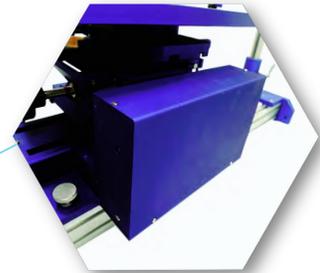
Thoughtfully designed for ease of use with multiple axis of motion to achieve required imaging windows. Compact design to limit space requirements.



Selection of probes available to cover an array of animal sizes and imaging applications.



Selection of animal beds to cover an array of animal sizes; providing heat to support the animal, as well as monitoring physiological parameters such as temperature, respiration, and ECG.



Optional 3D motor available for volume measurements.



Micro-positioners (x, y, and z axis) allow for precise adjustment of the imaging window. Animal beds can also tilt in all directions to achieve required imaging windows.

Scanning Modes

B-mode

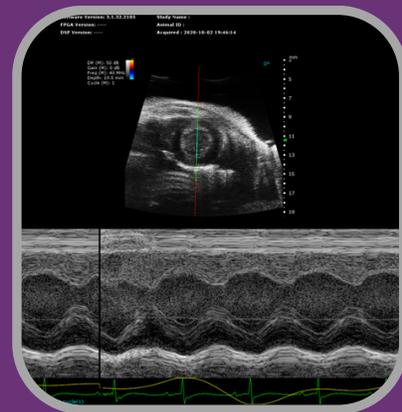
2D greyscale images are generated in real time to explore various anatomical and vascular structures. The Virtual Array technology is used to improve lateral resolution; while ECG-triggered imaging provides higher frame rate imaging in the heart, when needed.



Mouse liver, with hepatic vessels throughout.

M-mode

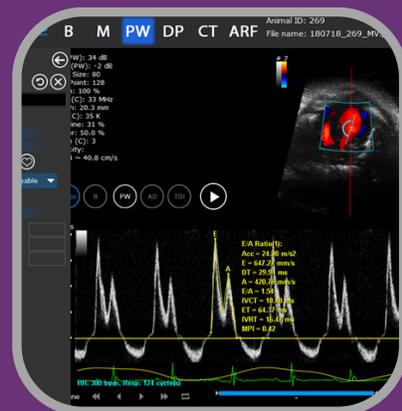
Motion along a single line can be analyzed; traditionally used to assess cardiac function or movement of vessel walls. Software includes full analysis package to calculate function from long or short axis views



Parasternal short axis view used to evaluate systolic function.

Pulsed Wave (PW) Doppler mode

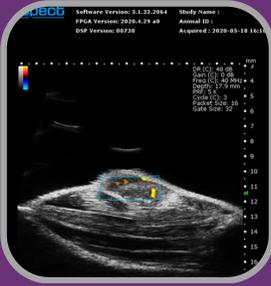
Blood flow velocity profiles are measured as a function of time. Software includes full analysis package to calculate diastolic function in the heart, and vascular function in vessels as small as the saphenous artery in a mouse.



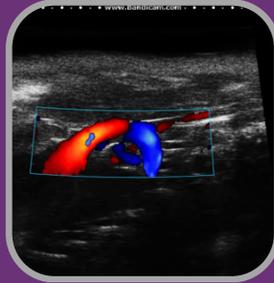
PW Doppler of the mitral valve inflow in a mouse. Measurements shown are to assess diastolic function.

*RAW digital RF data is available in every mode

Scanning Modes



Power Doppler showing blood flow at the periphery of this small subcutaneous tumor located on the hind limb.



Color Doppler showing change in direction of flow in the mouse Aortic Arch.



Tissue Doppler imaging at mitral valve annulus of a transgenic mouse.



Harmonic imaging of microbubble circulating within a subcutaneous tumor.

Color and Doppler mode

Provide a real-time overlay on the B-mode image where blood flow is detected. Color Doppler provides directional information, while Power Doppler is more sensitive for slower moving blood, for example in tumors.

Tissue Doppler mode

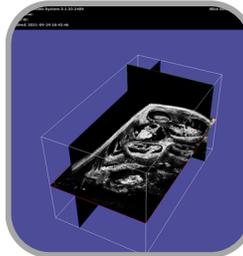
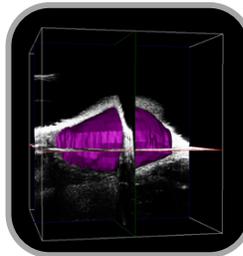
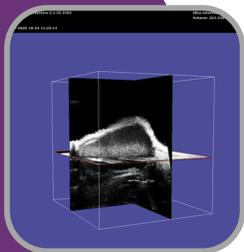
Tissue velocity profiles are measured as a function of time. Software includes full analysis package to perform measurements on the spectrum.

Contrast mode

Microbubble contrast agents can be used to enhance visualization of the microvasculature when injected intravenously. Both linear and non-linear (1st harmonic) imaging is available. Software may be used to calculate time vs. intensity curves.

3D B-Mode Imaging mode

3D images can be acquired on any number of anatomical targets throughout the abdomen. Volumetric measurements are then performed on the images.



33D orthotopic mammary fat pad tumor, volume found to be 263mm³.

3D image of pregnant mouse to aid in embryo staging and counting (approximately E10.5).

Image-Guided Injection

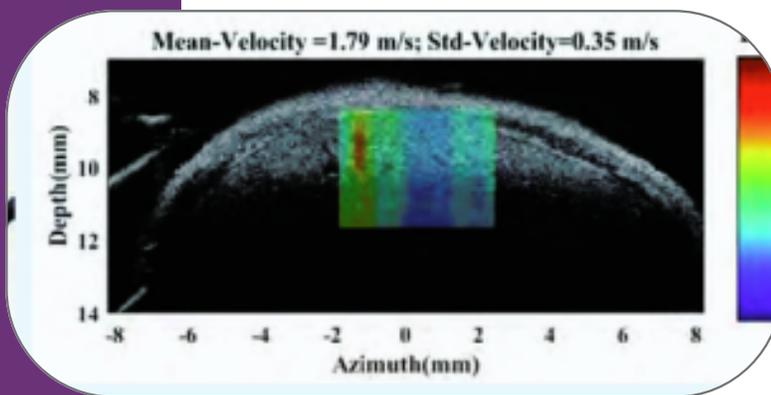
The unique design of the needle mount, integrating it with the probe, allows for coplanar alignment of the needle with the probe. Injections can be performed with steel needles, or pulled glass capillary needles depending on the target.



Injection into the left ventricle myocardium.

Shear Wave Elastography

A non-invasive method of measuring the elasticity of superficial tissues. Alterations in shear wave propagation may be detected prior to the development of larger lesions.

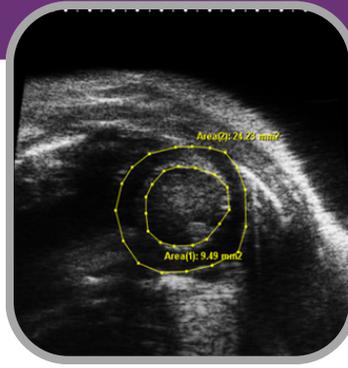


Cardiovascular Research

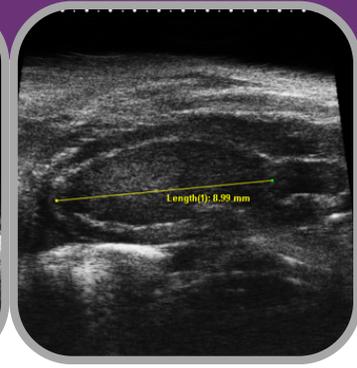
The Prospect TI allows for quantitative measurements of both systolic and diastolic function in cardiovascular research.



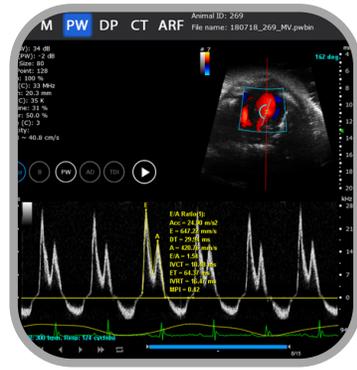
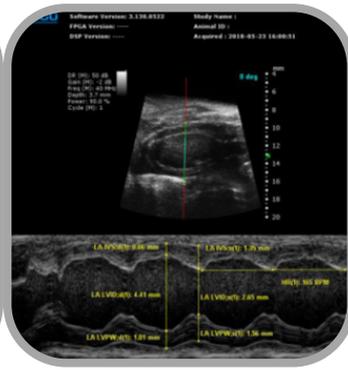
Mouse left ventricle in B-mode from a parasternal long axis view.



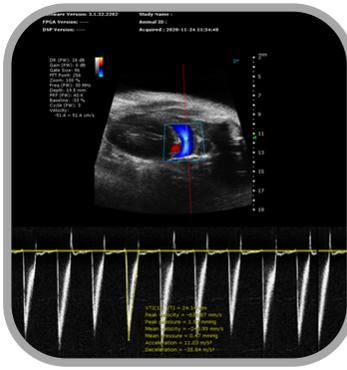
Various measures of cardiac function are included in the extensive analysis package for B-mode images, providing measures of ventricular volumes and cardiac function. Above images are from a mouse.



M-mode measures of cardiac function can be made from a long or short axis view, here shown in the mouse.



Flow through the mitral valve is used to assess diastolic function in the left ventricle (shown in a mouse).



Flow through the major vessels of the heart can be used assess function, here the mouse Pulmonary Artery is shown.



Tissue Doppler may be used to detect early changes in wall motion, which may precede changes in blood flow velocity.

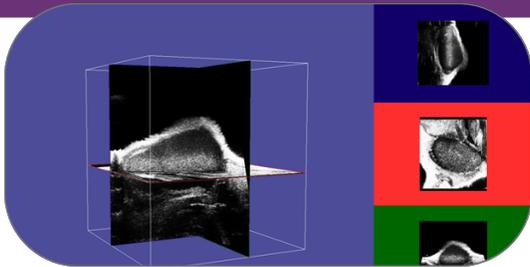


Rat left ventricle in B-mode from a parasternal long axis view.

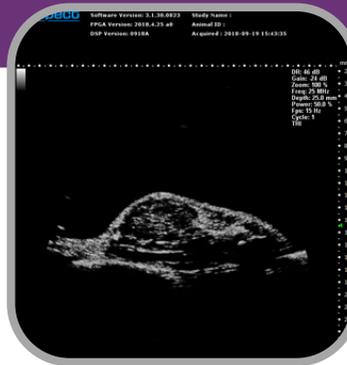
Applications

Cancer Research

Ultrasound can be used to detect tumors, even before they are palpable, allowing then for monitoring their progression over time. Size may be measured in 2D or 3D, while contrast imaging may be used to assess vascularity. Surrounding structures, such as lymph nodes or organs may also be examined in these models.



Orthotopic mammary fat pad tumor acquired with 3D B-mode, volume was found to be 263mm .



Non-linear imaging can be used to assess tumor microvasculature with the use of microbubble contrast agents.



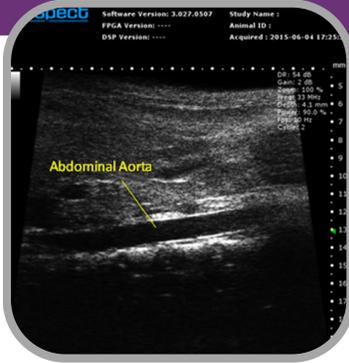
Surrounding structures such as lymph nodes (axillary lymph node in a mouse) can be examined in B-mode.

General Applications

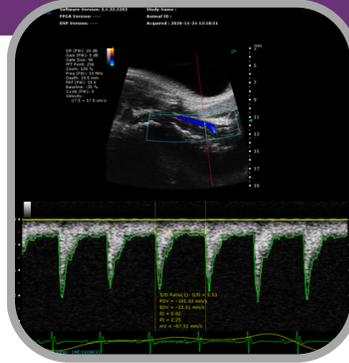
The high-resolution images acquired with the Prospect TI make it the ideal system to visualize a wide variety of internal structures, including abdominal organs such as the liver and kidney, as well as the surrounding vasculature. All imaging modes are available to look at structure and blood flow in these areas. The Prospect TI is not limited to only imaging mice and rats, but other species such as zebrafish, chick embryos, and superficial structures in larger species are possible.



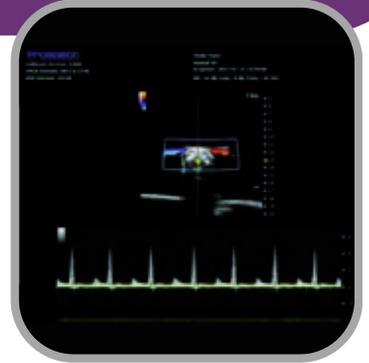
A variety of abdominal organs can be visualized, including the spleen (shown here in a mouse), liver, pancreas, kidney, etc.



Surrounding vessels can also be observed, here the abdominal aorta of a mouse is seen.



Color and PW Doppler can be used on even the smallest vessels. Here the mouse common carotid artery is shown. Analysis software allows for the calculation of the pulsatility and resistive indices.



The ventricular inflow of a zebrafish in PW mode.

Applications

Developmental Biology

Ultrasound is a non-invasive imaging technique, making it ideal for developmental applications. Pregnancy may be confirmed, embryos counted and staged, along with confirmation of first cardiac movement and continued cardiac development. All imaging modes are available here, allowing for cardiac movement and blood flow velocities to be measured. Image-guided injections also allow for in utero interventions when desired.



E9.5 mouse embryonic heart and neural tube.



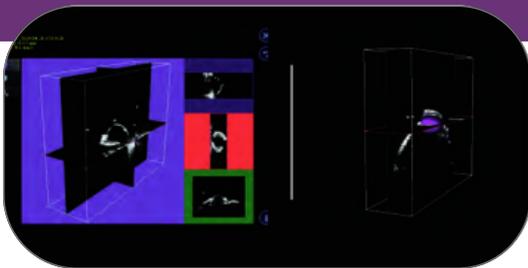
E12.5 mouse embryonic brain.



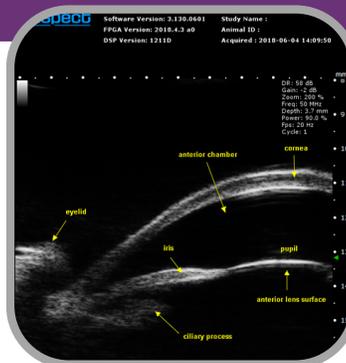
Umbilical cord of pregnant mouse (PW Doppler mode).

Ophthalmic Research

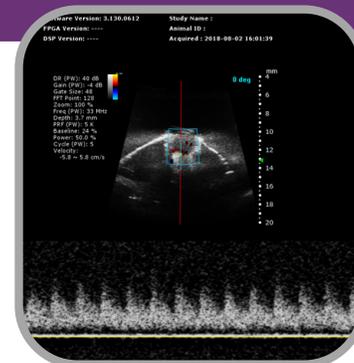
The eye is an ideal imaging target, in many species, as the resolution of the Prospect T1 allows for the small internal structures to be examined. Anatomy may be imaged in 2D or 3D with B-mode, and Color and PW Doppler may be used to examine blood flow in larger vessels, and Contrast Mode to look at flow through the microvasculature using microbubbles.



The mouse eye was imaged in 3D, with the volume found to be 57.6mm .



Anterior structures of the rabbit eye.



PW Doppler can be used to assess flow through the retinal artery, here shown in a mouse eye.

Prospect T1 Specifications

Resolution	Up to 30 μ m
Images modes	Standard: B-Mode, M-Mode, Pulsed Wave/Tissue/Color/Power Doppler, Contrast (linear and non-linear/harmonic); Optional: 3D B-mode, Shear Wave Elastography, Integrated Sonoporation
Probes	PB506e – Center Frequency 50MHz (30-60MHz) PB406e – Center Frequency 40MHz (20-50MHz) PB207e – Center Frequency 20MHz (10-30MHz)
Field of View	Depth up to 39mm (20MHz probe) / Width up to 23mm
Advanced Imaging Modes	Virtual array
Frame Rate	Up to 190fps (ECG mode)
Data Storage Format	SSD 250MB. jpg, avi, bmp, tif, DICOM SFSC/MFSC, RF raw data, cinelooop (proprietary format), video capture
Platform	Heating/ ECG gating/ Respiration gating Rat table and mouse table available
3D Motor	0.05mm scan interval in the scan axis
Display	15-inch XGA touch screen Intuitive TUI for improved workflow
Dimensions	360 x 280 x 65mm
Operation Software	Microsoft embedded Windows 10 (English)
Power Requirements	External Power Supply: AC Input 100V-240V (50Hz-60Hz) Max. Power consumption: 36Watts
Environment Requirements	Temperature (min-max) - Storage: -20° to + 60°C; Operating: 10° to 40°C Humidity: - Storage: 90%; Operating: 80%
Regulation Compliance	EMC: CISPR 11:2015 / EN55011; 2016 Group 1, Class A. EN61326-1:2013 Safety: EN61010-1:2010 Compliant with Euro RoHS, WEEE certification





Scintica:

562 Waterloo St., Upper Unit
London ON
N6B 2P9

TEL: +1 519 914 5495

FAX: +1 226 884 5502

WEBSITE: www.scintica.com

EMAIL: info@scintica.com



S-Sharp Corporation
11F., no.217, Sec. 3, Beixin
Rd., Xindian Dist.,
New Taipei City 231,
Taiwan

WEBSITE: www.s-sharp.com