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Vevo 2100 Condensed User Guide

The VisualSonics Vevo 2100 supports the highest frequency non-mechanical imaging transducers on the market and is particularly well suited to measuring anatomical structures, cardiac motion, and blood flow. This system is equipped with gas anesthesia and synchronized ECG and breathing signals.

Turn on Sequence

1. Turn on Main Power (back of cart).
2. On the left side of the cart, press the Computer Standby toggle.
3. The system starts the control panel backlights, the display monitor and the computer operating system.
4. Log on with Cornell net ID/password.
5. Launch the Vevo2100 software.
6. Study Browser window opens.
7. Check that desired transducer is connected to the active port.
8. Click New to create a new study. Choose yourself as operator.
9. Turn on physiological monitoring unit, anesthesia unit (oxygen, isoflurane vaporizer), and heat lamp (optional).
10. Anesthetize mouse; prepare for imaging.

L – Vevo 2100 high-frequency ultrasound platform
R – Imaging station equipped with integrated physiological monitoring for animal body temperature maintenance and controlled anesthesia delivery

Turn off Sequence

1. Export data to your folder in the Imaging Share Folder. Create a new folder in your name if you do not have one.
2. Press the Shutdown icon on the Study Browser window of the Vevo app. (computer shuts down, monitor powers down, and control panel backlights turn off.) The fans continue to run.
3. Let the fans run for 10 minutes to safely cool down the internal components, then push down the Main Power switch at the back of cart.
4. Turn off: oxygen supply, isoflurane vaporizer, physiological monitoring unit, heat lamp.
5. Clean transducers, stage and other surfaces contacted by mouse. *Do not use ethanol on stage!*

MicroScan Transducers

Transducers	Frequency, MHz	Max Image Depth, mm	Axial/Lateral Resolution *(at center freq)*	Applications
MS-250S	13 -24	20	75/165	Contrast mode, small tumor (< 15 mm diameter), mouse cardiology/abdominal, rat abdominal (< 300 g)
MS-400	18 - 38	20	50/110	Cardiovascular, abdominal; rabbit eye
MS-550D	22 - 55	15	40/80	Abdominal, embryo, vascular, tumors (<14mm)
MS-700	30 - 70	10	30/58	Epidermal Imaging, superficial tissue, subcutaneous tumors (<9 mm), vascular, ophthalmology

Image Acquisition Modes

Mode	Function
B-Mode	Location of anatomical structures
M-Mode	To measure movement and dimensions of cardiac structures (chambers & walls); single line acquisition: high-temporal (1000 fps) resolution for analysis of LV function
Anatomical M-Mode (AM)	Adjustable anatomical orientation in reconstructed M-Mode imaging; software automatically optimizes field of view for maximum frame rate
PW (Pulsed Wave) Doppler	To measure velocity and direction of flow; PW Doppler signal presented as a spectral image in the display window and as an audio output through system speakers
Color Doppler	Uses Doppler principles to determine the mean velocities of blood within the region of interest, then applies color that represents the various velocities under the convention of *BART (Blue Away Red Toward)*; used for distinguishing vascular from non-vascular tissue structures
Tissue Doppler	Quantification of myocardial tissue movement, for example, in assessing diastolic dysfunction
Power Doppler	To visualize and measure flow in 2D and/or 3D
3D Mode	Provides a 3D view of an area of interest; System acquires 3D data by creating a rapid series of B mode slices, then combining these slices into a whole image; can be performed in B-Mode, Power Doppler & Contrast Mode
Contrast Mode	To detect and quantify vascular structures and dynamics at the molecular level in 2D/3D; Used for real-time in-vivo applications such as: a. Targeted molecular imaging for visualizing and quantifying the expression of intravascular molecular markers — e.g. angiogenesis & inflammation b. Tumor perfusion and relative quantification of vascular volume & structure c. Assessment of myocardial perfusion and area of infarction
Digital RF Mode	Acquisition and exportation of radio frequency (RF) data in digital format for further analysis; full screen acquisition provides a complete data set for more comprehensive analysis and tissue characterization.