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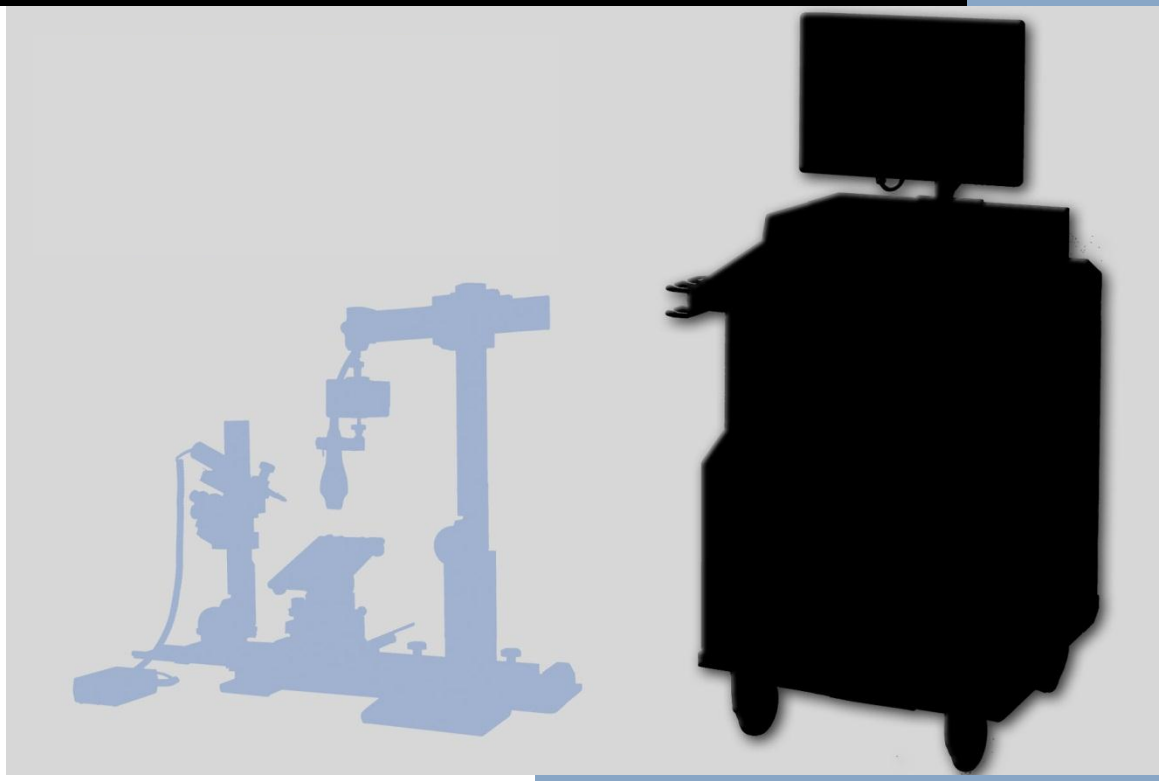
Vevo® LAZR Product Itemized List



EDU00491 – Rev 1.5

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Vevo® LAZR Photoacoustic Imaging System

The Vevo LAZR photoacoustic imaging system is fully integrated into the platform of the Vevo 2100 micro-ultrasound system and all of its subsidiary components. Users of the Vevo LAZR system are therefore equipped to conduct both photoacoustic and micro-ultrasound imaging with the Vevo 2100 system. **The software tools and packages listed in this document are for incremental photoacoustic operations only. For more information on general high frequency ultrasound imaging please refer to the product itemized list for the Vevo 2100 micro-ultrasound system (EDU00496).**

Vevo LAZR Photoacoustic Imaging System

VS-12239 Vevo LAZR Photoacoustic Imaging System (120V)

High sensitivity photoacoustic imaging inherently co-registered to high-resolution anatomical targets for volumetric and molecular quantification. System includes:

a) Instrumentation Hardware:
- 2 rolling portable carts with energy delivery and detection
- Workflow-driven operator control panel
- 3D motor
- Imaging Starter Kit (10907)
- Vevo LAZR transducer (LZt) holder and imaging station adaptor
- Vevo LAZRTight™ Photoacoustic Imaging Enclosure, which includes:
    - Enclosure contains laser light providing a safe environment for the operator and others in the vicinity of the system
    - Removable front facilitates animal preparation, sliding doors with interlock switches maintain user safety, ventilated and cooled interior with LED lighting, and webcam mount (webcam and monitor not included)
- **Includes** Vevo LAZR Spectro Monitoring (VS-20032)
- **Requires** Vevo LAZR transducer (LZt), Vevo Imaging Station, and Vevo Compact Dual Anesthesia System

b) Analytic Software:
- PA-Mode (Photoacoustic Mode) software package for 2D/3D image capture, detection and analysis
- PA-Mode Plus software package for image quality improvements including spatial compounding and frame averaging, energy monitoring and feedback, regional measurement graphing and improved signal detection and quantification.
- Cineloop image capture, display and review
- Co-registration of photoacoustic and anatomical images
    - Inherent co-registration in both 2D and 3D planes
- OxyHemo acquisiton for multispectral photoacoustic imaging with dedicated measurement/calculation & quantification software:
    - OxyZated™ tool for oxygen saturation quantification
    - HemoMeaZure™ tool for total hemoglobin assessment
- NanoStepper™ tool, which includes:
    - Operator tunable wavelengths in 2nm increments between 680nm - 970nm
    - Automated operator defined adjustments for up to 5 wavelengths for rapid acquisition of images
- Advanced post-processing capabilities, including:
    - Digital RF-Mode export
    - Review, analysis and export of co-registered data
- Integrated physiological trace, which includes:
    - Display of ECG, Respiration Waveform and body temperature (for adult rodents) (Requires Advanced Physiological Monitoring Unit (11426))

c) System Specifications:
- Pulsed laser (20Hz), tunable in 2nm increments from 680nm - 970nm
- 24" color display with articulating arm, 100Mb Ethernet connection, 250GB HD, and CD/DVD-Reader/Writer

VS-12241 Vevo LAZR Photoacoustic Imaging System (230V)

High sensitivity photoacoustic imaging inherently co-registered to high-resolution anatomical targets for volumetric and molecular quantification. System includes:

a) Instrumentation Hardware:
- 2 rolling portable carts with energy delivery and detection

- Workflow-driven operator control panel
- 3D motor
- Imaging Starter Kit (10907)
- Vevo LAZR transducer (LZt) holder and imaging station adaptor
- Vevo LAZRTight™ Photoacoustic Imaging Enclosure, which includes:
    - Enclosure contains laser light providing a safe environment for the operator and others in the vicinity of the system
    - Removable front facilitates animal preparation, sliding doors with interlock switches maintain user safety, ventilated and cooled interior with LED lighting, and webcam mount (webcam and monitor not included)
- **Includes** Vevo LAZR Spectro Monitoring (VS-20032)
- **Requires** Vevo LAZR transducer (LZt), Vevo Imaging Station, and Vevo Compact Dual Anesthesia System

b) Analytic Software:
- PA-Mode (Photoacoustic Mode) software package for 2D/3D image capture, detection and analysis
- PA-Mode Plus software package for image quality improvements including spatial compounding and frame averaging, energy monitoring and feedback, regional measurement graphing and improved signal detection and quantification.
- Cineloop image capture, display and review
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    - Inherent co-registration in both 2D and 3D planes
- OxyHemo acquisiton for multispectral photoacoustic imaging with dedicated measurement/calculation & quantification software:
    - OxyZated™ tool for oxygen saturation quantification
    - HemoMeaZure™ tool for total hemoglobin assessment
- NanoStepper™ tool, which includes:
    - Operator tunable wavelengths in 2nm increments between 680nm - 970nm
    - Automated operator defined adjustments for up to 5 wavelengths for rapid acquisition of images
- Advanced post-processing capabilities, including:
    - Digital RF-Mode export
    - Review, analysis and export of co-registered data
- Integrated physiological trace, which includes:
    - Display of ECG, Respiration Waveform and body temperature (for adult rodents) (Requires Advanced Physiological Monitoring Unit (11426))

c) System Specifications:
- Pulsed laser (20Hz), tunable in 2nm increments from 680nm - 970nm
- 24" color display with articulating arm, 100Mb Ethernet connection, 250GB HD, and CD/DVD-Reader/Writer

VS-12240 Vevo LAZR Photoacoustic Imaging System (100V)

High sensitivity photoacoustic imaging inherently co-registered to high-resolution anatomical targets for volumetric and molecular quantification. System includes:

a) Instrumentation Hardware:
- 2 rolling portable carts with energy delivery and detection
- Workflow-driven operator control panel
- 3D motor
- Imaging Starter Kit (10907)
- Vevo LAZR transducer (LZt) holder and imaging station adaptor
- Vevo LAZRTight™ Photoacoustic Imaging Enclosure, which includes:
    - Enclosure contains laser light providing a safe environment for the operator and others in the vicinity of the system
    - Removable front facilitates animal preparation, sliding doors with interlock switches maintain user safety, ventilated and cooled interior with LED lighting, and webcam mount (webcam and monitor not included)
- **Includes** Vevo LAZR Spectro Monitoring (VS-20032)
- **Requires** Vevo LAZR transducer (LZt), Vevo Imaging Station, and Vevo Compact Dual Anesthesia System

b) Analytic Software:
- PA-Mode (Photoacoustic Mode) software package for 2D/3D image capture, detection and analysis
- PA-Mode Plus software package for image quality improvements including spatial compounding and frame averaging, energy monitoring and feedback, regional measurement graphing and improved signal detection and quantification.
- Cineloop image capture, display and review
- Co-registration of photoacoustic and anatomical images
    - Inherent co-registration in both 2D and 3D planes
- OxyHemo acquisiton for multispectral photoacoustic imaging with dedicated measurement/calculation & quantification software:
    - OxyZated™ tool for oxygen saturation quantification
    - HemoMeaZure™ tool for total hemoglobin assessment

- NanoStepper™ tool, which includes:
    - Operator tunable wavelengths in 2nm increments between 680nm - 970nm
    - Automated operator defined adjustments for up to 5 wavelengths for rapid acquisition of images
- Advanced post-processing capabilities, including:
    - Digital RF-Mode export
    - Review, analysis and export of co-registered data
- Integrated physiological trace, which includes:
    - Display of ECG, Respiration Waveform and body temperature (for adult rodents) (Requires Advanced Physiological Monitoring Unit (11426))

c) System Specifications:
- Pulsed laser (20Hz), tunable in 2nm increments from 680nm - 970nm
- 24" color display with articulating arm, 100Mb Ethernet connection, 250GB HD, and CD/DVD-Reader/Writer

Vevo LAZR Photoacoustic Imaging Solution

VS-12242 Vevo LAZR Photoacoustic Imaging Solution (120V)

Enables the Vevo 2100 Imaging System (sold separately) to acquire high sensitivity photoacoustic imaging inherently co-registered to high-resolution anatomical targets for volumetric and molecular quantification. System includes:

a) Instrumentation Hardware:
- Vevo LAZR pumped laser and cart
- Vevo LAZR transducer (LZt) holder and imaging station adaptor
- Vevo LAZRTight™ Photoacoustic Imaging Enclosure, which includes:
    - Enclosure contains laser light providing a safe environment for the operator and others in the vicinity of the system
    - Removable front facilitates animal preparation, sliding doors with interlock switches maintains user safety, ventilated and cooled interior with LED lighting, and webcam mount (webcam and monitor not included)
- **Includes** Vevo LAZR Spectro Monitoring (VS-20032)
- **Requires** Vevo LAZR transducer (LZt), 3D-Mode (VS-20005), Vevo Imaging Station, and Vevo Compact Dual Anesthesia System

b) Analytic Software:
- PA-Mode (Photoacoustic Mode) software package for 2D/3D image capture, detection and analysis
- PA-Mode Plus software package for image quality improvements including spatial compounding and frame averaging, energy monitoring and feedback, regional measurement graphing and improved signal detection and quantification.
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    - OxyZated™ tool for oxygen saturation quantification
    - HemoMeaZure™ tool for total hemoglobin assessment
- NanoStepper™ tool, which includes:
    - Operator tunable wavelengths in 2nm increments between 680nm - 970nm
    - Automated operator defined adjustments for up to 5 wavelengths for rapid acquisition of images
- Advanced post-processing capabilities, including:
    - Digital RF-Mode export
    - Review, analysis and export of co-registered data

c) System Specifications:
- Pulsed laser (20Hz), tunable in 2nm increments from 680nm - 970nm

VS-12244 Vevo LAZR Photoacoustic Imaging Solution (230V)

Enables the Vevo 2100 Imaging System (sold separately) to acquire high sensitivity photoacoustic imaging inherently co-registered to high-resolution anatomical targets for volumetric and molecular quantification. System includes:

a) Instrumentation Hardware:
- Vevo LAZR pumped laser and cart
- Vevo LAZR transducer (LZt) holder and imaging station adaptor
- Vevo LAZRTight™ Photoacoustic Imaging Enclosure, which includes:
    - Enclosure contains laser light providing a safe environment for the operator and others in the vicinity of the system
    - Removable front facilitates animal preparation, sliding doors with interlock switches maintains user safety, ventilated and cooled interior with LED lighting, and webcam mount (webcam and monitor not included)
- **Includes** Vevo LAZR Spectro Monitoring (VS-20032)

- **Requires** Vevo LAZR transducer (LZt), 3D-Mode (VS-20005), Vevo Imaging Station, and Vevo Compact Dual Anesthesia System

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- Advanced post-processing capabilities, including:
    - Digital RF-Mode export
    - Review, analysis and export of co-registered data

c) System Specifications:
- Pulsed laser (20Hz), tunable in 2nm increments from 680nm - 970nm

VS-12243 Vevo LAZR Photoacoustic Imaging Solution (100V)

Enables the Vevo 2100 Imaging System (sold separately) to acquire high sensitivity photoacoustic imaging inherently co-registered to high-resolution anatomical targets for volumetric and molecular quantification. System includes:

a) Instrumentation Hardware:
- Vevo LAZR pumped laser and cart
- Vevo LAZR transducer (LZt) holder and imaging station adaptor
- Vevo LAZRTight™ Photoacoustic Imaging Enclosure, which includes:
    - Enclosure contains laser light providing a safe environment for the operator and others in the vicinity of the system
    - Removable front facilitates animal preparation, sliding doors with interlock switches maintains user safety, ventilated and cooled interior with LED lighting, and webcam mount (webcam and monitor not included)
- **Includes** Vevo LAZR Spectro Monitoring (VS-20032)
- **Requires** Vevo LAZR transducer (LZt), 3D-Mode (VS-20005), Vevo Imaging Station, and Vevo Compact Dual Anesthesia System

b) Analytic Software:
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- NanoStepper™ tool, which includes:
    - Operator tunable wavelengths in 2nm increments between 680nm - 970nm
    - Automated operator defined adjustments for up to 5 wavelengths for rapid acquisition of images
- Advanced post-processing capabilities, including:
    - Digital RF-Mode export
    - Review, analysis and export of co-registered data

c) System Specifications:
- Pulsed laser (20Hz), tunable in 2nm increments from 680nm - 970nm

Vevo LAZR Transducers

12331 LZ250: 13-24 MHz operating frequency Integrated Fiberoptic Transducer

- Integrated fiberoptics for pulsed laser light delivery
- 256 sensitive piezoelectric elements for acoustic detection
- Broadband Frequency: 13 MHz - 24 MHz
- Image Width: 23 mm, Image Depth: 30 mm
- Image Axial Resolution: 75 µm

50766 LZ400: 13-24 MHz operating frequency Integrated Fiberoptic Transducer

- Integrated fiberoptics for pulsed laser light delivery
- 256 sensitive piezoelectric elements for acoustic detection
- Broadband Frequency: 18 MHz - 38 MHz
- Image Width: 15.4 mm, Image Depth: 20 mm
- Image Axial Resolution: 50 µm

12332 LZ550: 32-55 MHz operating frequency Integrated Fiberoptic Transducer

- Integrated fiberoptics for pulsed laser light delivery
- 256 sensitive piezoelectric elements for acoustic detection
- Broadband Frequency: 32 MHz - 55 MHz
- Image Width: 14.1 mm, Image Depth: 15 mm
- Image Axial Resolution: 40 µm

Vevo LAZR Software Options

50025 Vevo Multiplexer

Management of photoacoustic signal from multiple sources on the same image (eg. nanoparticles, small molecules, endogenous hemoglobin, etc). Up to 5 signal sources can be displayed simultaneously allowing for multifactorial studies. For use in PA-Mode (12249).

50028 Vevo Spectro

Allows for the automated characterization of photoacoustic signal through the entire spectrum of the 290 available wavelengths (680-970 nm). Automated, sequential image acquisition at every wavelength with operator-controlled graphing and export. For use in PA-Mode (12249).

The Vevo LAZR photoacoustic imaging system supports all functionalities of the Vevo 2100 micro-ultrasound system. For more information on the Vevo 2100 micro-ultrasound products and features please refer to the product itemized list for the Vevo 2100.

Vevo LAZR Hardware Upgrade

VS-20032 Vevo LAZR Spectro Monitoring Upgrade

Equips the Vevo® LAZR Photoacoustic Imaging System (sold separately) with external energy sensing hardware to provide the most robust and reliable spectroscopic photoacoustic data.
- **Includes** Vevo Spectro (50028) software, for automated characterization of spectroscopic signals
- Wavelength dependent energy characterization at the site of imaging
- Automatic image and data compensation based on energy readings

VS-50689 Vevo LAZR 3-port Upgrade

Configures the Vevo LAZR Imaging System (sold separately) with two additional optical outputs at 532 nm and 1064 nm.
- 532 nm is ideal for high-sensitivity, superficial vascular imaging.
- 1064 nm is ideal for deep imaging of vasculature.
- Both additional outputs can also enable imaging of in vivo contrast agents that provide peak signal at these wavelengths.
- Compatible with all existing LZ series Integrated Fiberoptic Transducers.

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