VivoSight

VivoSight Dx Instructions for Use

Diagnosis at the speed of light

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1 APPLICATION SPECIFICATION SUMMARY

Optical Coherence Tomography (OCT) is a cross-sectional imaging technique that is applicable to in-vivo medical examination. The technique is analogous to ultra-sound scanning, but because it uses Near Infra-Red (NIR) light it has much finer resolution (<10µm) for the same imaging depth. OCT allows one to see, in-vivo, in real time and non-invasively, tissue microstructure, without exposing the subject or user to ionizing radiation.

The VivoSight Dx will enable the user to:

1. Enter and manage patient and descriptive data
2. Acquire single and multiple 2-dimensional 16-bit OCT images of sub-surface tissue
3. Produce 3D volumes from multiple 2D images which can be rendered using third party software
4. Export OCT images as TIFF and as DICOM compliant image files

Expected locations of use are in-patient and ambulatory care settings. The complete system is suitable for use within the patient environment.

Users of the equipment need to be computer literate healthcare professionals, and have undergone the appropriate level of training for the different areas of operation. At a minimum it is expected that the user will be at nurse practitioner level.

There are no restrictions on patient population, and no restrictions related to the intended part of the body to which imaging can be applied.

2 INDICATIONS FOR USE

The VivoSight Dx is indicated for use in the two-dimensional, cross-sectional, real-time imaging of external tissues of the human body.

This indicated use allows imaging of tissue microstructure including skin, and enables detection and display of regions within the scanned area that are in motion (Dynamic OCT) to aid trained and competent clinicians in their assessment of a patient's clinical conditions.

3 CONTRAINDICATIONS

The VivoSight Dx is contraindicated for:

- Invasive procedures including use on open wounds
- Use on the eyeball

4 WARNINGS AND PRECAUTIONS

- Ensure that this manual has been read and understood before using the VivoSight Dx.
- If the VivoSight Dx shows signs of damage or is suspected of malfunction it should be taken out of service immediately and returned to the manufacturer or their authorised service centre for repair.
- The VivoSight Dx contains no user serviceable parts and should not be opened except by authorised service personnel of the manufacturer.
- The VivoSight Dx
    - Is **NOT** MRI safe and should **NOT** be taken into an MRI environment.
    - Is **NOT** defibrillator proof.
    - Must **NOT** be used in the presence of flammable anaesthetic mixtures with oxygen or nitrous oxide.
- If it is necessary to use the VivoSight Dx adjacent to other equipment, observe both the VivoSight Dx and the other equipment to make sure they are operating normally. Ensure the umbilical is separated from other cables. Only use cables supplied with the device.

  The emissions characteristics of this equipment make it suitable for use in professional health care facility environments. It is not intended for use in a residential environment, and might not offer adequate protection to radio frequency communication services. The user may need to take mitigation measures, such as moving or reorienting the equipment.
- The VivoSight Dx is a CLASS 1 Laser Product. Do **NOT** attempt to stare directly into the beam. Do **NOT** attempt to insert a mirror or other reflecting device into the beam.
- If the VivoSight Dx does not operate as expected, consult section 8 “Setup Guide”. If it continues not to operate as expected, stop using the system immediately and contact the manufacturer or their approved agents for service
- The VivoSight Dx images may only be used to supplement other clinical information and should **NOT** be used to replace current clinical information, practice or judgment, and should be used in accordance with appropriate clinical guidelines e.g. Guidelines issued by the European Dermatology Forum (http://www.euroderm.org/edf/index.php/edf-guidelines).
- The VivoSight Dx is **NOT** intended to provide direct diagnosis or to make clinical decisions and is not intended to replace trained staff or existing test and assessment procedures.
- The VivoSight Dx should only be cleaned and disinfected as specified in these instructions (section 12).
- If the VivoSight Dx is used in a manner **NOT** specified by the manufacturer, the protection provided by the equipment may be impaired.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- **NO** modification of this equipment is allowed. Do **NOT** modify or make any new connections to the monitor.
- Do **NOT** operate the VivoSight Dx outside the rated power supply range specified. Ensure the it is only connected to an earthed supply.

- Use the green on/off switch on the cart do power the device up and to power it down. Do **NOT** power down the device by disconnecting from mains power at the wall socket.
- Do **NOT** touch any USB connections on the cart shelf or connections to the Monitor and the Patient at the same time
- Do **NOT** block the cooling vents on the rear of the VivoSight Dx
- Keep the mains plug accessible at all times in order to isolate the device from the mains if required
- The VivoSight Dx is **NOT** to be used with USB devices with a separate connection to the mains such as printers, externally powered storage devices and other accessories that may compromise isolation during clinical procedures
- Only cables <3m long should be used to connect acceptable devices to the USB ports on the cart shelf.
- When using the VivoSight Dx, ensure that the mains lead and umbilical are **NOT** a trip hazard.
- The recommended operating temperature range of the VivoSight Dx is +15°C to +30°C.
- The VivoSight Dx should be placed on a stable level surface, away from direct sunlight.
- Before moving the VivoSight Dx:
    - Clear the top shelf of the cart of any items other than the keyboard and mouse
    - Stow the mains cable and topical probe.
- Grasp the monitor from the front when positioning. Do **NOT** insert fingers into any potential pinch points on the pillar.
- It is recommended that at least two people move the system when the terrain is uneven or inclined, or when moving the system over thresholds.
- Contact the manufacturer if attempting to move the device between buildings.
- Do **NOT** place loads in excess of 10kg on the top shelf of the cart.
- Do **NOT** apply loads to the umbilical in excess of 1.5 kg shear force, and 5 kg tensile force. If the umbilical shows any signs of splitting, contact the manufacturer.
- Windows Defender antivirus software is installed on delivery. However, it is recommended that the user checks that the software conforms to the user's IT security and internet policy.
- Do not install third party software on the device, it may interfere with the device operation.

5 FORESEEN MISUSES

Misuses of the probe

- **DO NOT** use on broken skin, due to the risk of cross-infection if blood is transferred to the standoff and not adequately disinfected (contraindicated).
- **DO NOT** attempt to scan inside the mouth or inside the ear canal or inside the vagina. The device is NOT intended for internal use (contraindicated).
- **DO NOT** attempt to scan the eyeball (contraindicated).
- **DO NOT** use the device for clinical applications for which there is insufficient clinical evidence. **ALWAYS** follow the locally applying Clinician Guidelines provided by your dermatology professional body for the clinical application.
- **DO NOT** place the probe on top of the shelf, it may fall off onto the floor and damage the delicate internal optics; **ALWAYS** re-holster the probe when not in use
- **DO NOT** continue to use if there is visible damage or cracks to the probe covers or umbilical
- **DO NOT** attempt to remove probe covers, due to risk of exposure to electrical or laser hazards
- **DO NOT** continue to use if the camera image is absent or has become very blurry due to dirt or contamination

Misuses of the standoff

- **DO NOT** use the device without cleaning and disinfecting the standoff between patients. The device is not intended for use as a sterile device.
- **DO NOT** use the device without a standoff fitted; it will not be possible to obtain a useable image
- **ALWAYS** use the device with the correct size standoff to achieve a good focus (see section 9.3 of this manual, Setting the Correct Working Distance); if this is not done, the image quality will be reduced resulting in poor performance.
- **DO NOT** use a standoff if it has visible damage, is cracked or is dirty or is visibly contaminated.

Misuses of the software

- **DO NOT** fail to enter the patient details for the scan about to be performed and **ALWAYS** ensure that they are correct when scanning to avoid risk of scan data being saved to the wrong patient record
- **DO NOT** delegate scanning or interpreting scans to an untrained or inexperienced user without direct supervision, to avoid risk of incorrect use of software or probe
- **DO NOT** leave the device unattended in public area with Windows or Wifi password bypassed or disabled due to risk of malicious access
- **DO NOT** install 3rd party software on the device as it may interfere with correct operation of the VivoSight software
- **DO NOT** ignore warnings supplied by the VivoSight software such as ‘Disk nearly full’ and always seek assistance

	Misuses of the cart and peripherals • **DO NOT** disconnect the device from power at the wall socket while it is switched on due to risk of corruption of data; always turn off first using the green power button and wait for the green illumination to go off before disconnecting from the wall socket • **DO NOT** connect the device to a 3rd party display monitor • **DO NOT** subject the device to major shocks or vibration when transporting it to a new location as it may affect the device function • **DO NOT** place an excessive weight > 10 kg on the shelf, for example a young child or cot, due to the risk of mechanical failure of the shelf • **DO NOT** pull on the probe umbilical to try to move the entire device as it may cause the device to topple, or cause damage to the umbilical and internal fibres **Misuses from operating environment** • **DO NOT** use the device in very humid conditions exceeding the specification (80% RH) due to the risk of condensation on the lens and of malfunction of the electronics • **DO NOT** use the device in very cold conditions or very hot conditions outside the specified ideal working range (15 to 30 ºC); due to risk of malfunction of the laser or electronics **General misuses** • **DO NOT** continue using the device if it is suspected to be faulty in any way or if the image quality is consistently worse than normal (too dim or reduced depth penetration); cease using it and seek support. • **ALWAYS** ensure that the device is adequately maintained with annual checks by the manufacturer

6 RESIDUAL RISKS

1. Risk of loss of Essential Performance of Degraded Image Quality

The image quality provided by the device may be affected by any of the causes listed below. There is a residual risk that the user may not notice the degraded performance and continue using the device resulting in poorer than optimal results for the patient:

- Incorrect standoff fitted by user resulting in image out of focus
- Optics damaged by dropping of probe or excessive shocks/vibration
- Use in very humid conditions outside specified operating range
- Optics or internal fibre assemblies manufactured incorrectly and not adequately tested
- Damage to internal fibres caused by umbilical failure or internal abrasion during use
- Malfunction of the internal electronics including drift of calibration
- Image is somehow corrupted by software malfunction

2. Risk of incorrect positioning of probe

- The camera and LED illumination enable the user to position the probe accurately on the lesion. If the camera malfunctions or becomes dirty then this capability will be degraded; if the user nevertheless continues to use the device then inaccurate probe placement may happen resulting in poorer than optimal results for the patient

3. Risk of device misuse

- Due to misuse by the user, a result which is not optimal for the patient may result. See preceding section 5 Foreseen Misuses for a list of misuses and related risks;

4. Risk of mixing up patient records

There is a risk that data is stored in the wrong patient record, leading to later confusion over a patient's actual condition and then to incorrect treatment, if:

- The user enters the wrong patient details for the scan they are about to perform and does not notice their error;
- There is a software malfunction causing data to be saved to the wrong record

5. Risk of cross-infection:

The device is not sterile and should be disinfected between patients. There is a risk of cross-infection between patients if:

- The device is used on broken skin (contraindicated) and the standoff becomes contaminated with infected blood from a diseased patient and is not replaced and is used on another patient also with broken skin (contraindicated) enabling infected blood to be transferred to the second patient
- The device is used on broken skin (contraindicated) with a dirty/non-sterile standoff enabling bacteria to enter and infect the wound
- The device is used on a patient with a contagious skin disease and the standoff is not disinfected before use on the next patient

	6. Risk of mechanical injury or minor cuts: • There is risk that the device could tip onto the patient if the device is misused by excessive pulling on the umbilical when the wheels are locked; • There is risk that the shelf could collapse causing injury to user or patient if a weight well in excess of the specified maximum is placed on the shelf; • There is a risk of cuts to the user or patient if the device is used when the covers or standoff are damaged or broken and exposing sharp edges **7. Risk of biotoxicity:** • Although the device parts that come into contact with the patient and user have been evaluated for biotoxicity to EN 10993, there is residual risk of biotoxicity from contact with subject's skin. **8. Risk of electrical shock:** • There is residual risk from electrical shock due to multiple internal failures of the power electronics including failure of fuses to blow leading to exposed parts becoming electrically live. **9. Risk of eye damage from laser:** • There is residual risk of eye damage from exposure to laser light if the installed laser significantly exceeds maximum specified power output and this is somehow not detected in final testing and the probe is then used to scan the eyeball (contraindicated) **10. Risk of EMC affecting other equipment:** • There is residual risk of the device emitting RF emissions causing nearby equipment to be affected or vice versa, if either device malfunctions to cause such RF emissions outside its normal working EMC conditions **11. Risk of loss of data or loss of data confidentiality** • There is residual risk of loss of all patient data if both of the hard drives that make up the D: mirrored volume fail simultaneously • There is residual risk of loss of patient data confidentiality if the user disables Windows security features or if the device is affected by malware infecting the user's computer equipment which is then connected to the device (including USB sticks, Wifi-LAN etc.)

7 ICONS AND SAFETY LABELS

7.1 LASER SAFETY LABEL

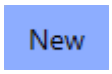
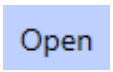
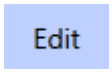
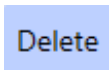
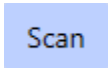
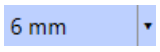
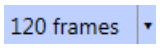
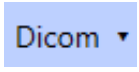
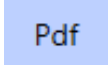
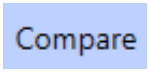
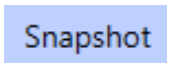
Label	Description
	Laser Classification (BS EN 60825-1: 2007) Location: Top of probe above objective lens

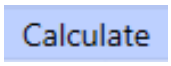
7.2 ICONS USED ON THE SYSTEM LABELS

Icon	Description
	Attention, consult accompanying documents
	Consult Instructions For Use
	Refer to Instructions For Use
	Type CF Applied Part
	Type Number
	Serial Number
	Date of Manufacture
	Manufacturer
	Non-Ionizing Electromagnetic Radiation
	Standby / On
	USB
	Computer Network
	Alternating Current
	Protective Earth

Icon	Description
	Temperature Limitation
	Humidity Limitation
	Atmospheric Pressure Limitation
	Fragile
	Keep Away from Sunlight
	Keep Dry
	MR Unsafe

7.3 ICONS AND FREQUENTLY USED FUNCTIONS IN THE VIVOSIGHT SOFTWARE

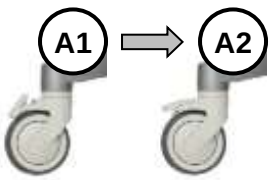
Icon	Description
	Icon to start the VivoSight Software
	Info - Displays VivoSight system and software version
	Info with alert - display alert messages
	Minimize - minimize the VivoSight window
	Close - close the VivoSight Software
	Home – go to home page with filters unset
	Back – navigate to previous screen
	Search – Start search
	Clear – Clear text field
	Create a new item
	Open the selected item
	Edit the selected item
	Delete the selected item
	Start Freerun
	Set Scan Width
	Set number of frames
	Export OCT images as Tiff
	Export OCT images as DICOM
	Export PDF Report
	Compare OCT scans
	Export the current OCT frame, Enface slice, 3D skin surface image (if enabled), and camera image as PNG

Icon	Description
	Calculate estimated Plexus Depth, Vessel Diameter, and Vessel Density
	Play-pause button in the middle (►) "jump to previous/next annotated frame" buttons to the left and right
	(yellow) **annotation marker** on the (blue) **navigation slider**
	No Camera image. ⚠ If this appears, stop using and seek assistance.
	Import Dermoscopy image
	Annotation "Select" tool
	Annotation "Text" tool
	Annotation "Ruler" tool
	Free-Run "Trim" button
	Annotation "Arrow" tool
	Annotation "Star" tool
	Annotation "Bookmark" tool

Function	Screen and Probe	Keyboard
Start Freerun Stop scanning	 Black Circle  	F7
Start Enface or Start Dynamic	 White Circle  	F8

8 SETUP GUIDE

CLEAN PRIOR TO PATIENT USE



B

SYSTEM SETUP

A Move the cart into its final position and apply the cart brakes

B Plug the mains cable into the mains supply

C Position the monitor

D Turn on the system by briefly pressing the Standby / On button on top of the main unit

E If required, turn on the monitor by pressing the Standby / On button

F Log in to the system

Start the software using the VivoSight icon 

G Remove the probe from the cart tray

SYSTEM SHUTDOWN

G Replace the probe in the cart tray when all scans are complete

F Exit the VivoSight software

D Shut down the system by briefly pressing the Standby / On button, ensuring the shutdown process completes

B Unplug the mains cable, and stow at the back of the top shelf

A Release the cart brakes

	The VivoSight Dx must complete shutting down before mains power is disconnected. In the event of a temporary unplanned disruption to mains power, the device will continue to function for approximately 60 seconds before shutting down automatically.

9 VIVOSIGHT TOPICAL PROBE

The topical probe has been designed to be held comfortably in either the left or right hand, and operates in any orientation for ease-of-access to the region being imaged. It incorporates a colour camera (with white LED illumination) which shows on-screen the area of skin being imaged and the exact location of the scan line, to assist the user with positioning the scan on the area of interest.

9.1 PROBE BUTTON FUNCTIONS

There are 2 buttons located on the back of the probe which provide the following functions:

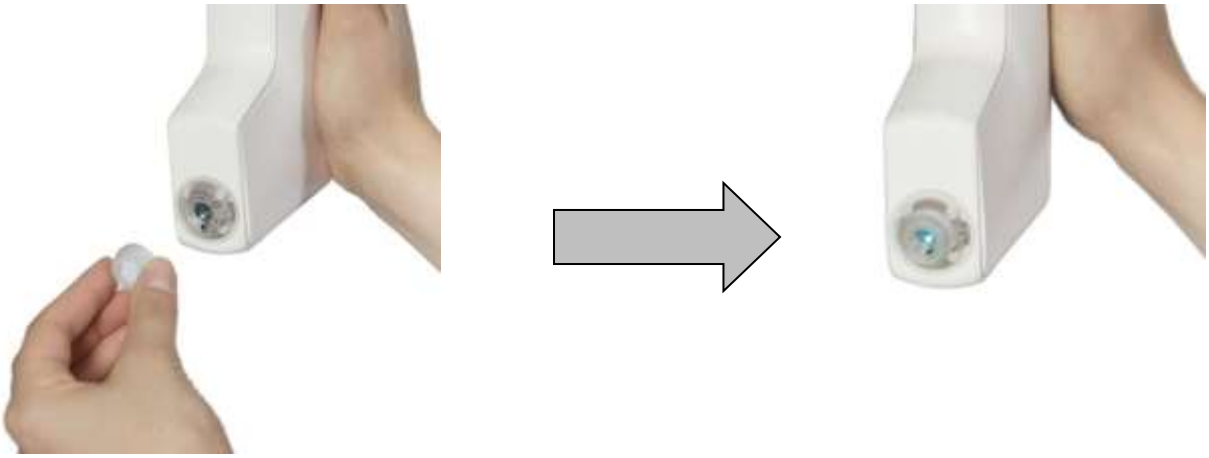
Start Freerun / Stop scanning

Start Enface

9.2 FITTING OF THE STANDOFF

A probe standoff is provided with the VivoSight Dx to aid positioning the probe on the skin surface and setting the correct scan distance. Probe standoffs are provided in 6 different sizes, each identified by between 1 and 6 small holes on the front face, to enable the skin surface to be positioned correctly (see below).

The standoff is fitted to the probe by clipping it sideways onto the retaining ring on the objective lens mount.



The standoff can be removed by doing the reverse, and simply unclipping it from the objective lens mount.

The standoff can also be rotated to set the most appropriate orientation for the skin area being scanned.

9.3 SETTING THE CORRECT WORKING DISTANCE

The correct working distance is set as follows:

1. Set the software to capture a scan (see section 10 for a detailed description of software operation).
2. Position the probe so that the standoff is gently pressing against the patient's skin around the region-of-interest (see figures below); use the camera view to locate the scan exactly as desired on the lesion or skin area.

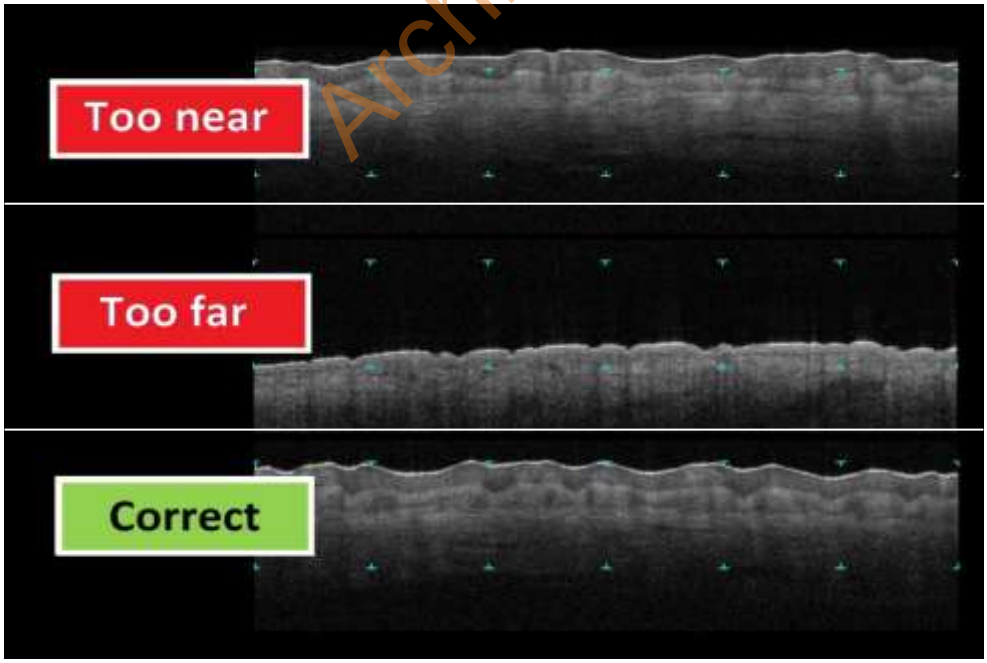
Probe placed with standoff touching the skin. The free hand not holding the probe is used to steady the probe on the patient.

Note how the VivoSight display is easily visible to the user during the scan.

3. By observing the image in the VivoSight software, adjust the working distance so that the region of skin you wish to see is within the region demarcated by the onscreen 'T' shape markers (see figures below). The image of the skin is moved vertically within the frame by:
   i. Changing the fitted stand-off for a different length (see 9.2 for the correct procedure).
   ii. Slightly varying the pressure applied to the probe. Do not press hard, but use some pressure; after completing the scan a circular imprint of the standoff will be visible on the skin surface for a short period. This is nothing to worry about and will clear naturally within minutes. The probe should not slide about on the skin; if it is then you are probably not pressing enough.
5. Use a standoff with more holes (i.e. a larger standoff) if the skin surface is too high / mostly above the blue tick marks. Use a standoff with fewer holes (i.e. a smaller standoff) if the skin surface is too low / mostly in bottom half of the focus region. Optimum image quality is achieved with skin surface positioned at the top of the tick mark boxes. See below.

⚠	Ensure that the correct working distance is set with the correct standoff so that the tissue region of interest is located within the blue tick marks as shown in the diagram below. If this is not done, then the tissue will be out of focus and details of the image will be unclear and will be difficult to interpret.

6. Ensure that the patient is comfortable before proceeding with the scan.



In the top image, the skin surface is above the top row of tick marks and so is out of focus.

In the middle image, the skin surface is near the bottom row of tick marks and so most of the tissue is outside the tick mark area and is out of focus

In the bottom image, the skin surface is located approximately at the top row of tick marks and all of the tissue image is in the tick mark area and is in focus.

Often the skin surface bulges or slopes and is not possible to always achieve these optimal conditions. In that case, do not rely on image features located outside the tick mark area which indicates the region of focus.

9.4 DYNAMIC OCT

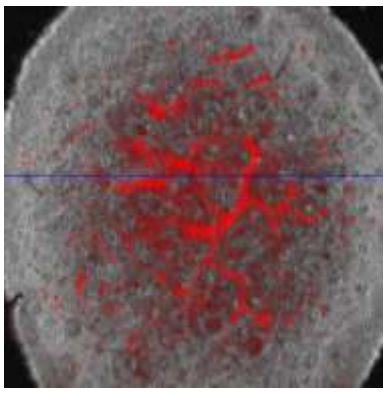
⚠	Ensure that the correct working distance is set as in section 9.3 above, and that the Dynamic OCT Signal is clearly visible in the resulting EnFace View at top right with vessel shapes visible.

Enable Dynamic OCT by clicking on the down arrow next to the white button marked Enface: 

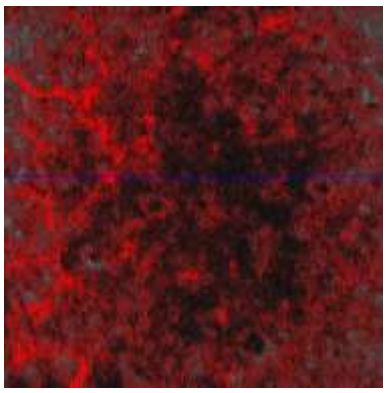
The label will change to Dynamic: 

To disable, click on the down arrow to change it back to Enface.

EnFace View



Dynamic OCT Signal
Bright Red linear or dotted features of vessels



Dynamic OCT Noise
Dim Red cloud

If the Dynamic OCT image resembles the lower image ‘Dynamic OCT Noise’ then the enface depth is too deep to provide reliable vessel images or the focus is set incorrectly with the wrong standoff fitted.

10 USING THE VIVOSIGHT SOFTWARE

Start the VivoSight software using the VivoSight **Icon**.

1. If the Patients Management Screen is not visible, click **Home**.

2. Patients Management Screen – Selecting or adding patients

   For an Existing Patient:

   Use the search fields in the Header Bar to find an existing patient. Double click the Patient to enter the Patient Screen.

   OR for a New Patient:

   To define a new patient, fill-in the patient details in the Header Bar (this can be completed later in the Patient Screen). Click the New button.

3. Patient Screen – Selecting or adding Lesions

   For an Existing Lesion:

   Use the search fields in the Lesion Bar to find an existing Lesion, click the Lesion and then the Scan button.

   OR for a NEW Lesion

   Define a new Lesion by filling in the Lesion details (this can be completed later) and click on the **Lesion Map** to define the location of the Lesion. Finally specify the Lesion's Clinical Diagnosis from the selection and click the Scan button.

4. Scan Screen - Acquiring scans

   ⚠ Check that the patient details displayed at the top of the screen are correct, otherwise data may be saved to the wrong patient record.

   ⚠ Select the appropriate stand-off in accordance with the Instructions for use (see Section 9.3)

   i. Position the stand-off against the skin.
   ii. To change the width of the scan click the 6 mm **Scan Width** button and adjust the vertical slider.
   iii. To change the number of frames click the 120 frames **Frames** button and adjust the vertical slider.
   iv. To change between Dynamic mode on or off click on the 

arrow next to the white button at bottom right of the screen

   ⚠ It is important that a sufficient number of slices is set. A reduced number of slices will affect the resolution of the Enface view. 120 is recommended.

   v. Using the context camera and OCT image, locate the Lesion to be scanned and press the **White** button on the probe. This captures a square area surrounding the Lesion. The Default settings are 120 frames 6 mm wide.
   vi. The blue line displayed on the Enface window can be dragged to take you through the B-scan frames. The green line displayed on the B-scan can be used to alter the depth of the Enface slice.

5. To acquire an additional scan of the same Lesion, press the **Black** button, repeat the steps above.
6. Once scanning is complete, click **Back** to return to the previous screen or **Home** to return to the Patients Management Screen.

11 USE WITH OTHER EQUIPMENT

The VivoSight Dx may only be used with the following items:

Additional Software such as:

- Microsoft Office
- Tiff compatible image viewers
- Antivirus software

	Windows Defender Antivirus software is installed on delivery. However, it is recommended that the user checks the software conforms to the user's IT security an internet policy. Only software specified in this manual may be safely installed on the system without consulting the manufacturer or authorised service representative for advice

USB devices that do **NOT** require additional drivers or a separate connection to the mains may be connected to the USB ports on the Cart shelf. These include:

- USB flash drives (Including U3)
- USB powered disk drives
- USB wireless receivers for use with remote keyboards, mice, and printers.
- DermoGenius dermatoscope

A network connection with galvanic isolation is provided on the rear of the VivoSight Dx to connect the system your local area network. Consult your IT department for connection and configuration.

	Do NOT connect USB devices with a separate connection to the mains including: Printers Externally powered storage devices Any other accessories that may compromise isolation during clinical procedures Only cables <3m long should be used to connect acceptable devices to the USB ports on the Cart shelf Do NOT modify or make any new connections to the monitor

12 CLEANING AND DISINFECTING

	The VivoSight Dx including, cables and or other parts may **NOT** be immersed in water or other liquids. Do **NOT** use solvents or abrasive cleaners on plastic parts or the display screen

Cleansers and disinfectants must be CE marked indicating an intended purpose of medical devices & specified for use on plastics.

Before cleaning, disconnect from the mains electrical supply. Always apply the liquid to the cloth and squeeze out surplus liquid before applying to the device. Never make contacts of connectors wet.

12.1 TOPICAL PROBE, STANDOFF AND UMBILICAL

The topical probe, standoff and umbilical should be cleaned and disinfected prior to patient use with standard hospital disinfectant appropriate to the materials. Ensure all joints on the probe are disinfected thoroughly. The topical probe, standoff and umbilical should also be cleaned and disinfected after patient use to remove any contamination.

Contact cleaning of the objective lens should be minimised. However, if it is required, use a lens cloth or clean air duster. Should further cleaning be required, use a soft cloth moistened in Isopropyl alcohol and then polish with a lens cloth.

The standoff is not intended for use on broken skin. However, if the standoff is contaminated and cleaning is not considered to be adequate, the contaminated standoff should be disposed of to clinical waste and a fresh standoff used for the next patient.

12.2 KEYBOARD, MOUSE

The keyboard and mouse should be cleaned and disinfected at regular intervals in line with your establishment's infection control policy

12.3 CART AND MONITOR

All accessible surfaces on the cart and monitor may be cleaned regularly using a cloth dampened with water and detergent that is indicated for use on plastic. Apply the liquid to the cloth and squeeze out surplus liquid. Do **NOT** apply liquid to the system or its cables.

Alcohol lens wipes may be used to clean the screen.

The cart and monitor are **NOT** intended to be disinfected regularly. Only disinfect when required due to contamination of external surfaces.

13 PRODUCT LIFECYCLE

The VivoSight Dx product lifetime is **7 years**, based on the expected lifetime of the laser used in the device.

Other parts of the device that may incur wear and may require replacement during the device lifetime include:

Standoff. It is recommended that these are replaced annually as precaution against wear and possible breakage.

Hard disks. The hard disk manufacturer specifies a 5 year lifetime. If the device software starts to run slowly, this may be a sign that the hard disk(s) are wearing out and need replacement.

Umbilical. The probe umbilical outer sleeve may split from repeated flexing. If this is observed, report it immediately so that it can be repaired.

Power unit. The power unit contains capacitors which may degrade if the device is stored unused for more than 2 years, or if the device is kept in humid conditions > 70% RH; resulting in reduced capability to continue operating during a momentary mains electricity supply interruption (brownout). If the device is stored unused for more than 2 years or in humid conditions, contain the manufacturer before reusing the device so that the power unit can be maintained.

In all cases, contact your local representative for VivoSight, or Michelson Diagnostics, for advice and support if the device requires service or replacement parts.

14 TECHNICAL DATA

The following technical data relates to the VivoSight Dx

14.1 SYSTEM SPECIFICATION

Key Part References

VivoSight Dx1302	1191.PL.122
HP 22” Monitor	
Keyboard	UK: KG22295 or Perixx 10904 DE: KG22294 or Perixx 10901 US: KG22296 or Perixx 10905
Mouse	KH22219 or as supplied with Perixx keyboard

Applied Parts

Standoff Set	1191.MD.317

Performance

System Type	Swept-source Fourier-Domain OCT
Laser centre wavelength	1305 ± 10 nm
Laser frequency sweep range	≥ 147 nm
Axial optical resolution (in tissue)	< 10 µm
Lateral optical resolution	< 7.5 µm
Scan area	6mm x 6mm
Imaging depth	Tissue dependent, typically 1 mm for skin
A-line rate	20 kHz
Scan time	< 15s (6mm x 6 mm, 120 frames, enface mode) < 40 s (6mm x 6 mm, 120 frames, dynamic mode)

Mode of Operation

Continuous operation
NOT suitable for use in the presence of flammable anaesthetic mixtures with oxygen or nitrous oxide.

Safety

Type of Protection against Electric shock	Class I (Safety Earth)
Degree of Protection against Electric shock	Type CF Applied Parts
Method of mains isolation	Disconnection of the mains plug from the electrical supply
EMC/EMI compliance:	Complies with IEC60601-1-2 Ed 4 Emissions Standard and Immunity Standard for Medical Equipment, Professional Health Care Facility Environment Complies with EN 301 489-1 V2.2.1:2019 Emissions, and Immunity Standard for radio equipment and services – Professional

Water & Dust Protection

The topical probe and umbilical have been designed to reduce ingress of liquids. However, do **NOT** place under running water or immerse in liquids.

All parts of the system are IPX0. No water or dust protection is claimed.

Power

Supply Voltage	100-240V~ 50-60Hz Nom. (Earthed supply)
Maximum Power	250VA
Mains Input Connector	IEC 320 C13 Socket 10A
Fuse	T 5AL 250V

Weight and dimensions

Dimensions (W x D x H) (Monitor at maximum height)	0.55 x 0.57 x 1.61 m
Weight	56 kg

Environmental

Operating

- Temperature of 15°C to 30°C
- Humidity of 20% to 80% non-condensing
- Height above sea level to be less than 2000m
- Floor to be level to within 10° of horizontal during use

Movement and storage between use

- Temperature of 10°C to 40°C
- Humidity of 20% to 80% non-condensing
- Atmospheric Pressure 50kPa - 106kPa
- Floor to be level to within 10° of horizontal when being moved
- Thresholds should be less than 20mm in height during transport conditions

Transportation and Storage in original packaging

- Temperature of 0°C to 40°C
- Humidity of 20% to 80% non-condensing
- Atmospheric Pressure 50kPa - 106kPa
- Prior to transportation, the monitor and monitor support must be removed from the cart by the manufacturer or their approved agents and packed in the original packaging
- If stored for extended periods in humidity > 70%, or for more than 2 years without operation, the capacitive energy store unit should be replaced before use

14.2 FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

15 TESTING INCLUDING PRE USE CHECKS

15.1 PRE-USE CHECKS

Before each use the VivoSight Dx, including cables must be inspected for wear & damage. Systems showing wear or damage should **NOT** be used. If device has not been operated for more than 2 years, or if in any doubt as to device safe operation, contact the manufacturer or authorised service representative for advice.

15.2 ELECTRICAL SAFETY TESTING

Electrical safety tests should be performed using a Rigel Medical or similar test system to the requirements of BS EN 62353 including.

- Earth Bonding
- Insulation
- Patient applied parts leakage Type CF
- Signs of damage which may lead to the exposure of live parts

Connect the safety tester earth clip to the bottom plate of the VivoSight underneath the main housing.

After testing check the VivoSight Dx for correct operation.

Frequency of the electrical safety tests should be at least annual or more frequently in the event of actual or potential damage or if your establishment's code of practice specifies.

16 MAINTENANCE & ACCESSORIES

16.1 MAINTENANCE

The VivoSight Dx does **NOT** include any user serviceable parts. Therefore, the manufacturer or their approved agents for service should be contacted in the event of damage, malfunction or change in performance.

If the VivoSight Dx does not operate as expected, consult section 8 Setup Guide. If the VivoSight Dx continues not to operate as expected, stop using the system immediately and contact the manufacturer or their approved agents for service.

	Repair of the VivoSight Dx is to only be carried out by the manufacturer or their approved agents for service. Do not attempt to open any cover; the device is not user-serviceable.

Test system performance at least every year or shorter period if specified in your medical establishment's code of practice. Annual maintenance is recommended to be carried out by the manufacturer or their approved agents for service including electrical safety testing as defined in section 15.2.

16.2 ACCESSORIES

Probe standoffs 1191.MD.317 are provided with the VivoSight Dx to aid in positioning the probe on the skin surface at the correct scan distance. Replacement sets will be supplied annually to customers with warranty or service contracts for their device, or can be ordered when required.

17 WARRANTY

The manufacturer warrants the product, when new, to be free from defects in materials and workmanship and to perform in accordance with manufacturers specification for a period of one year from the date of purchase. The manufacturer will repair or replace at their discretion any components found to be defective or at variation from the manufacturer's specification within this time at no cost to the purchaser.

Your original supplier will administer this warranty on behalf of the manufacturer; and initial contact relating to a claim under this warranty must be made to the distributor.

After contacting your original supplier to agree warranty cover it shall be the purchaser's responsibility to return the product.

The warranty does not include breakage or failure due to tampering, misuse, neglect, accidents or modifications. This warranty is also void if the product is not used in accordance with the manufacturer's instructions or is repaired during the warranty period by any person other than the manufacturer or their approved service agent.

The date of purchase / delivery determines the commencement of this warranty. No other expressed or implied warranty is given and no consequential claims will be accepted.

18 DISPOSAL

Information on Disposal of Waste Electrical & Electronic Equipment (Europe Only)

This symbol on the products and / or accompanying documents means that used electrical and electronic products should not be mixed with general waste.

Disposing of this product correctly will save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. If you are unsure of your national requirements with respect to disposal please contact your local authority, dealer or supplier for further information.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

The above information is based on the European waste electrical and electronic equipment directive 2012/19/EU.

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Compliant with
Medical Device Directive
93/42/EEC

Compliant to RoHS
2011/65/EC