SimScope® HYBRID SIMULATOR | User Manual

Cardionics™
The Heart of Auscultation

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Introduction

Thank you for purchasing the Cardionics SimScope and/or Bionic Hybrid Simulator a Simulation Solution for Standardized Patient Assessment.

Safety Precautions

The following symbols are applicable to the device.

⚠	Attention: Read and understand all warnings and cautions before use.
IPX0	No degree of protection against ingress of water.
LATEX	This product may contain natural rubber latex.

⚠ Caution:

- Before each use check the SimScope ear tips for secure fit. Do not use if missing or loose.
- Place patches on healthy skin. Do not place over sores or cuts. Excessive body hair may make removal uncomfortable.
- Use only AAA alkaline batteries for the SimScope and for Wi-Fi models use the Energizer Ultimate Lithium™ battery. Properly dispose of, or recycle, spent batteries.
- Use only Cardionics supplied lithium 18650 size rechargeable batteries with the Bionic Hybrid Simulator Tech Pack. Using batteries other than what Cardionics provides may result in damage to the device, burns or other bodily injury.
- Do not freeze the Bionic Hybrid pulse system.
- Do not kink or excessively bend the pump tubing / cables.
- Disconnect all cables and remove batteries before performing any cleaning procedures. Use standard alcohol swab or wipe (70%

Isopropyl Alcohol). Do not immerse any part of the SimScope or Bionic Hybrid Simulator Tech Pack.

- The internal wireless module complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.
- No serviceable parts. Do not attempt to repair or service the SimScope or Bionic Hybrid Simulator Tech Pack. Return to Cardionics for all repairs. Call 281-488-5901 for service directions before returning.
- The BHS pulse assembly does contain latex covered by fabric.

Getting Started

Congratulations on the purchase of the SimScope or Bionic Hybrid Simulator. To get up and running quickly, perform the following steps:

❖ Software Installation

Software supplied is designed to work with Microsoft Windows 7 and newer operating systems. If the purchase is supplied with a computer, then the software is already loaded. If not, follow these steps to install the software.

1. Insert the installation disk.
2. Computers with Auto Play will automatically launch the installation Wizard. If not, locate and double-click the *setup.exe* file.
3. Follow the Wizard Install instructions.
4. A Driver Installation Wizard will automatically appear during the install process. Follow the new Wizard's instructions.

❖ Registering Software

After installation is complete the software must be registered before use.

1. Locate the SimScope icon on the Desktop.
2. Double-click to launch the program.

3. Fill out the registration form. For computers connected to the internet, the process of registering is instant. If unable to connect to the internet, click register by phone and follow the instructions.

❖ Connecting the SimScope or Tech Pack with USB

Locate the USB cable and connect the SimScope or Bionic Hybrid Simulator Tech Pack to the computer. A USB interface allows access to the sound library, configurations, and settings within the device. Changes made via USB are stored within the device and become the default setting. Note: Changes made over Wi-Fi for wireless models are temporary and default back to settings made through USB once powered off.

1. The “New Found Hardware Wizard” may appear for first time connections and Windows 7 users. Note: This may occur for each USB port on the computer. If the wizard does not appear skip to step 6.
2. Click “No, not at this time” and click next.
3. Click install auto.
4. Click finished.
5. If asked to restart click “Later.”
6. Devices connecting with the PC application for the first time will activate a pop-up asking for a friendly name. Click yes.
7. Create a friendly name for the device. A name is sometimes easier to identify rather than the default serial number.
8. The device is assigned the new name and displayed in the device drop-down box above.
9. Sound assignments and adjustments can be edited, if desired, by moving or swapping sounds to the right pane and clicking the save icon when finished. Refer to PC Application on page 7 for more details.
10. Wireless SimScope models require credentials to connect over Wi-Fi. Refer to SimScope Wi-Fi Configuration on page 12.
11. Disconnect the USB cable from the device and repeat for additional SimScopes or Bionic Hybrid Simulator Tech Packs.

12. Press any volume button on the SimScope to activate and begin using. Note: For Bionic Hybrid Simulator users press the power button on the Tech Pack first to establish a wireless network. Then connect with the PC or tablet and power the SimScope.

SimScope Overview

The SimScope resembles a sleek electronic stethoscope with binaural ear tips for listening, chest piece for placing on a patient, and middle enclosure housing the electronics and replaceable AAA battery. Patches, disposable disk with tan fabric on top and adhesive tape on bottom, are placed on the standardized patient or actor to provide site markers for the SimScope. On the side of the enclosure is a USB port used for connecting a PC running SimScope software. The software allows the user to assign sounds from the SimScope library to sites. Once setup the SimScope chest piece is placed on a patch and the sound assigned to that site is played. For controls, there are two volume buttons located on the chest piece labeled plus and minus.

❖ Turning On and Off

To turn the SimScope on press any volume key located on the chest piece. Upon power up a voice prompt plays, “System activation. Mode one.” The SimScope will remain on 90 seconds after the last key press or sound playback. At shutdown a voice prompt plays, “System powering down.”

❖ Volume Adjustment

The volume can be adjusted up or down while listening to a sound. Pressing a key once will make a small incremental adjustment while holding the key down will make rapid adjustments. An audible beep is played during a key press providing feedback as to the direction of volume change and when the beginning or end of adjustment has been reached.

❖ Battery

The SimScope uses a AAA battery that can be accessed from the back of the main enclosure by sliding the battery door outward. A standard alkaline battery will power the SimScope up to three hours or 120 uses at ninety seconds a session. Models equipped with Wi-Fi require a high

drain type battery to provide similar operating time. The Energizer Ultimate Lithium™, like the one supplied with the wireless SimScope, will power the SimScope with Wi-Fi up to four hours or 110 uses at 130 seconds a session.

As the battery approaches end of life the SimScope will play a voice prompt saying, “low battery” at power up. The SimScope may continue to operate on low battery for a while, but unexpected shut downs will eventually occur without warning. Wireless models will disable the Wi-Fi and alert the user at power up if low battery is detected. Battery life varies greatly between brands and types.

When the SimScope is connected to the PC through the USB cable power is drawn from the computer and not the SimScope battery. The battery is not recharged during this setup only reserved.

❖ Verification Mode

Pressing both volume keys simultaneously will toggle between verification and normal modes. In verification mode the SimScope will play a voice prompt identifying the tag site assignment. This can be useful for verifying correct tag placements on a standardized patient or learning the different heart locations on a manikin. If desired, this feature can be disabled through the SimScope PC software.

Bionic Hybrid Simulator Overview

The Bionic Hybrid Simulator is a garment worn by a Standardized Patient (SP) for simulating physiological conditions to test a Student or an examiner's diagnostic and procedural skills. The Bionic Hybrid Simulator, controlled wirelessly by simulation software, enhances the exam performance by responding in real time to diagnosis and treatment while providing feedback to the SP and instructor. The garment features a five wire EKG output, radial and carotid artery pulses, ear buds for audible cues to the SP, and auscultation for heart, breath, bowel, and bruit.

The suit provides an elastic band near the hip to secure the Tech Pack and zipper pockets for routing the pulse pump assembly. The pulse pump provides connections to the suit, Tech Pack, and ear phones.

❖ Turning On and Off

To activate the Bionic Hybrid Simulator, press the power button located on the Teck Pack. Upon power up a green light flashes and voice prompt plays, “System activation” followed by a series of beeps while the

Wi-Fi is initialized. Pressing the power button again will activate the shutdown sequence. A voice prompt will ask to confirm shutdown by pressing the power button again. At shutdown a voice prompt plays, “System powering down.”

❖ Volume Adjustment

The plus and minus keys found on the Tech Pack controls the volume to the headphones worn by the SP.

❖ Battery

The Bionic Hybrid Simulator uses two 18650 size batteries that can be accessed from the back of the Tech Pack enclosure. The battery door can be detached by removing the center screw with a Phillips style screwdriver. Fully charged batteries will power the Bionic Hybrid Simulator Tech Pack for approximately 12 hours. When the batteries are near completion the Tech Pack will blink red. The batteries can be recharged using the Cardionics supplied charger.

When the Tech Pack is connected to the PC through the USB cable power is drawn from the computer and not the batteries. The batteries are not recharged during this setup only reserved. Other features such as pulse and EKG are disabled while USB connected.

PC Application

The PC application is a program used to access the library and scenarios stored inside the SimScope or Bionic Hybrid Simulator Tech Pack. It allows the user to assign sounds to site locations, preview sounds, adjust volume defaults, create scenarios, and store them back to the device.

❖ Application Overview

The figure and table that follows describes the controls and features of the PC application.

Figure 1: SimScope PC Application

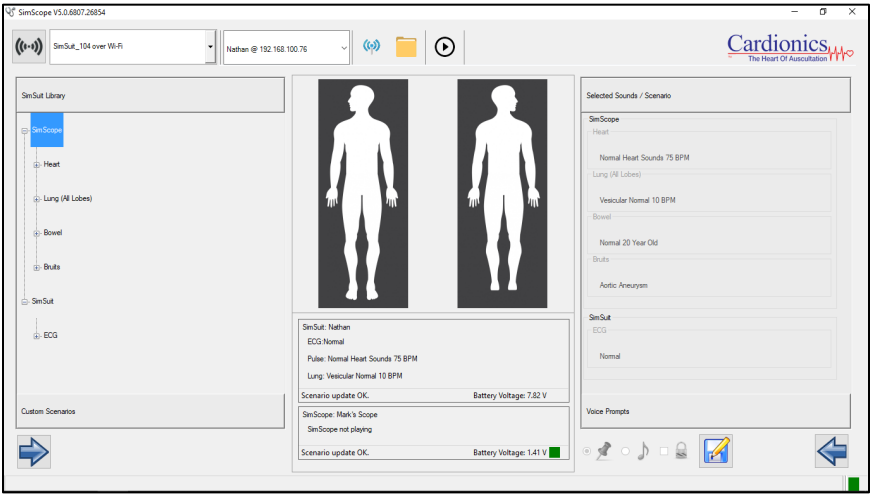


Table 1: SimScope PC Application Functions

Name	Function	Icon
Disconnect Wi-Fi	Forces a disconnect from an access point or wireless Bionic Hybrid Simulator connection.	
Access Point Drop Down Box	Displays a list of available access points or Bionic Hybrid Simulators. Selecting one will direct the computer to connect with a Wi-Fi access point or an access point of a Bionic Hybrid Simulator.	
SimScope Drop Down Box	Displays the current device serial number. Clicking the drop-down arrow lists other devices (if any) currently connected. Selecting a different device from the list will become the new center of focus. Holding the mouse over the window will pop-up additional information; such as, the firmware version, MAC address, and port connection. For Wi-Fi connections the friendly name and IP address are displayed in place of the serial number.	

Name	Function	Icon
Upgrade Scenarios	Opens a dialog box for selecting a zip file containing new sounds or libraries that can be downloaded to the SimScope or Bionic Hybrid Simulator Tech Pack.	
Wi-Fi Configuration	Opens the Wi-Fi configuration window containing network information stored on a device and lists all PC registered wireless devices.	
File Restore	In the event a device fails to connect to the PC App due to corrupted files this feature restores them. Disconnecting a device prematurely while communicating over USB can cause files to be damaged.	
Log File	Initiates a log that records all activity that takes place in the PC App.	
Stop Log	Stops recording activity to the log file.	
Insert Note	Allows the user to insert notes into an active log file.	
Cardionics The Heart Of Auscultation	Clicking the logo will open the Cardionics On-Line Learning Website within the computer default browser (provided that the computer has internet access).	
Library	Pane that displays the library or libraries available on the device. Bold names indicate sound file assigned to the “Selected Sounds / Scenarios” pane (right pane). Double-clicking a grayed-out sound moves it to the right pane and replaces a previous assigned sound (if any).	
Selected Sounds / Scenarios	Lists the sounds assigned to the SimScope when the SimScope first connects with the PC application. Also serves as a scratch pad for selecting sounds, listening, and adjusting volumes before saving them to a device.	

Name	Function	Icon
Add Scenario To Selected Scenarios	Right arrow button moves a selected sound from the library over to the Selected Sounds / Scenarios pane. Same function as double-clicking the sound.	
Remove Scenario From Selected Scenarios	Left arrow button moves a selected sound from the Selected Sounds / Scenarios pane back to the Library pane. Same function as double-clicking the sound.	
Play By Location	Type of mode that configures the SimScope to play sounds assigned by the user. Most commonly used mode. During power up the SimScope will play the voice prompt, “Mode one.” Altering this function is not available during Wi-Fi connection.	
Play by Sound File	Type of mode that configures the SimScope to play sounds defined by the patch rather than sounds assigned by the user. Patches are typically special ordered and tailored per customer specifications. During power up the SimScope will play the voice prompt, “Mode two.” Altering this function is not available during Wi-Fi connection.	
Lock Site Verification	Prevents the user from switching the SimScope to Verification mode. Often used to ensure the user memorizes the sites without help. Altering this function is not available during Wi-Fi connection.	
Save Selected Scenarios to SimScope	Saves all the sounds assigned to the Selected Sounds / Scenarios pane to the SimScope. Previously stored assignments on a device are replaced. If saving over Wi-Fi, the device defaults back to previous settings at power down.	
Custom Scenarios	Pane that contains names of custom scenarios. Selecting one (if any) will replace the Selected Sound Scenario pane with the custom setup.	

Name	Function	Icon
Scenario Delete	Button that will permanently remove a selected Scenario from the list.	
Create Scenario	Creates a scenario by saving all sounds and volume settings in the Selected Sound / Scenario pane. Scenarios can only be created while USB connected.	
SP Manikin Views	Graphical representation of the Standardized Patient's anterior and posterior views. Different areas of the manikin highlight to show where the SimScope is auscultating in real time.	
Center Console	Area below the SP Manikin graphics displaying information of one or more devices connected to the same access point or Wi-Fi network. Includes friendly name of the device, playing status, IP address, and current battery voltage.	
Status Bar	Bottom left displays the status of the PC App. Provides information on the device and PC application during saves, reads, connections and exits.	

❖ Upgrading the SimScope with new sounds

A device can be upgraded with new or custom sounds obtained from Cardionics. Upgrading sounds is performed by connecting the SimScope USB to a computer running the SimScope PC software. Note: wireless devices also require USB connection to the PC for sound/ECG upgrades. Follow these easy steps:

1. Open the PC application.
2. Connect the device to the computer using the USB cable.
3. After the PC application recognizes the device, the Update Scenario icon will appear. Click it.

4. The open dialog box will pop up. Navigate to the zip file containing the new sounds. Note: Only a file name with matching serial number is compatible with the connected device. Select the file and click open.
5. The files are extracted and saved to the device. Large libraries will take longer to download than short ones. This step may take some time to complete.
6. Once the sounds are downloaded a pop-up message will appear. Click okay. The new sound or sounds will be permanently visible in the Library pane and ready for use.

SimScope Wi-Fi Configuration

SimScope with Wi-Fi capability require information regarding the wireless environment before use. The default settings that come preloaded from factory (see Figure 2) are common to most networks except for the SSID, pass phrase and possibly the security/authentication setting. In some cases, it may be easier to refer the Wi-Fi setup to a network administrator. Obtain the SSID and pass phrase of the wireless network before proceeding. Note: A SimScope supplied with a Bionic Hybrid Simulator system is already configured to work with the Bionic Hybrid Simulator. No setup is necessary.

1. Run the SimScope PC application on a computer connected to the network.
2. Connect the SimScope to the PC using the USB cable.
3. After the PC application displays “SimScope ready” click the icon to display the Wi-Fi configuration window.

Only fill in the network settings located under the SimScope Wi-Fi Configuration heading (right column). Refer to Table 2 on page 13 for explanations on each setting. In some cases, updating the SSID and pass phrase first while leaving the rest of the settings to default is the best approach. Refer to Figure 2 on page 13 as an example.

4. Make sure that the check box “Enable Wi-Fi Module” is checked. Click the “Save” button to save settings.
5. Click the “Test” button to test the Wi-Fi settings. A message will appear in the bottom-left corner indicating pass or fail. If the test fails, verify the settings and try again.

❖ Wi-Fi Configuration Window (SimScope)

The following is an example of the Wi-Fi Configuration window along with a table explaining each setting under the SimScope Wi-Fi Configuration heading.

Figure 2: Wi-Fi Configuration

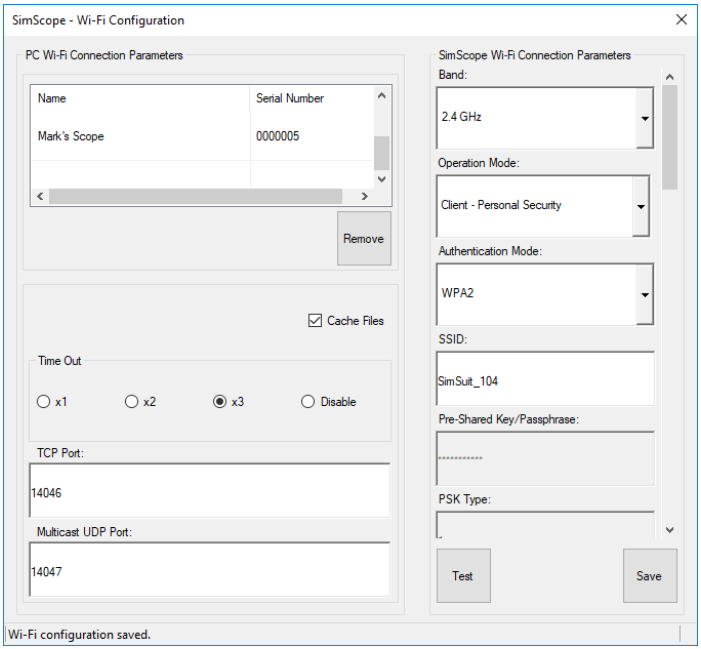


Table 2: SimScope Wi-Fi Configuration Functions

Name	Function
Band	Frequency band or spectrum. Two options available are 2.4 GHz and 5 GHz. Not all computers or networks support the 5 GHz band.
Operation Mode	Wi-Fi security Mode. Client connects to an access point with open mode, personal security or a Bionic Hybrid Simulator. Enterprise allows connection to an Enterprise enabled network that hosts a Radius server. Access Point is reserved for the Bionic Hybrid Simulator Tech Pack only.

Name	Function
Authentication Mode	A form of encryption (if any) used between access point and SimScope. Both Client and Enterprise operation modes include Wi-Fi Protected Access (WPA) and Wi-Fi Protected Access II (WPA2). Both are security protocols or certification programs available.
SSID	Service Set Identifier. Name of the network (access point) to join.
Pre-Shared Key / Pass-phrase	Also called password, network security key or just key. It is a phrase that provides security encryption for the wireless network (available only in Personal security mode). For SSID set for *Bionic Hybrid Simulator_xxx* where xxx is the last three characters of the Bionic Hybrid Simulator serial number. The Pre-Shared key is unavailable for edit and is grayed out for the BHS. It is automatically populated.
PSK Type	Used to set the Pre-Shared Key to join WPA/WPA2-PSK enabled access points. This field is not available for edit. Default is 1.
Enable Wi-Fi Module	Enable / Disable check box. Check this box to enable the SimScope Wi-Fi module and to connect to the PC application wirelessly. Disabling will extend battery life and speed up the initialization time during power up.
Channel	Default is “All Channels.” The channel number of the access point. By selecting all channels, the SimScope will try them all to find the access point with the SSID name. A channel is required for Bionic Hybrid Simulator Wi-Fi configurations.
Data Rate	Default is Auto-rate. Data rate in Mbps.
Transmit Power Level	Default is High. There are three levels of transmit power: Low (7dBm), Medium (10dBm), and High (18dBm).
Multicast IP Address	Required for SimScope connecting with a Bionic Hybrid Simulator or multicast compatible network. The default is 239.0.0.0.

Name	Function
TCP Port (right column)	Transmission Control Protocol Port. Default is 14046. Socket used for SimScope communication data. This value must match the SimScope TCP Port value found in the left column of the window.
UDP Port	User Datagram Protocol Port. Use a default value of 0 for multicast compatible networks. Other type of network use a value of 14047. Used for pulse or timing beacon with automated systems or accessories requiring synchronized actions with the SimScope heart rate or carotid pulse event.
Multicast UDP Port	User Datagram Protocol Port. Use a default value of 14047 for multicast compatible networks. Otherwise, use a value of 0.
Network Type	Type of network. Infrastructure or Ad-hoc network. The default is infrastructure.
Feature Bitmap	Configures different sub-features in the SimScope Wi-Fi module. Not available for edit.
Mode 5 Pin USB	Default value of 0. Configures the fifth pin on the USB connector as an output for pulse or timing beacon. Used for pulse or timing beacon with automated systems or accessories requiring synchronized actions with the SimScope heart rate or carotid pulse event.
TCP/IP Feature Bitmap	Configures different sub-features in the SimScope Wi-Fi module. Not available for edit. Default value is 4.
Custom Bitmap	Configures different sub-features in the SimScope Wi-Fi module. Not available for edit. Default value is 1.
Join Feature Bitmap	Configures different sub-features in the SimScope Wi-Fi module. Not available for edit. Default value is 16.
Debug Bitmap	Enables playback error messages to user. Not available for edit. Default value is 1.
Type of Service	Default is ‘0’ for “Best Effort.” Not commonly modified.

Name	Function
SSL WS Enable	Default is ‘0’ to open a normal TCP socket. Not available for edit.
Ciphers	Configures different sub-features in the SimScope Wi-Fi module. Not available for edit.
EAP Authentication	Extensible Authentication Protocol (EAP). Extensions under WPA and WPA2 Enterprise. Visible only for Enterprise security.
EAP Inner Method	Microsoft’s Challenge Handshake Authentication Protocol (MSCHAP and MSCHAPv2). Visible only for Enterprise security and valid for TTLS/PEAP. In case of TLS/FAST should be fixed to MSCHAPv2.
EAP User Identity	User ID which is configured in the user configuration file of the Radius Server. Visible only for Enterprise security.
EAP User Password	Password which is configured in the user configuration file of the Radius Server for the User Identity. Visible only for Enterprise security.
Certificate Task	Selects the type of certificate to load. After selecting a task, a file picker window will open for selecting the certificate file to load. Visible only for Enterprise security.
Certificate File	Displays the file path and file name of the certificate to load.
Run	Button that loads the file shown in the Certificate File window to the SimScope. Visible only for Enterprise security.
DHCP Enable	Dynamic Host Configuration Protocol: Enable / Disable check box. Used in infrastructure mode. Protocol (if supported) that will assign a unique IP addresses to the SimScope. Not available for edit.
Source IP Address	If DHCP is disabled, an IP address should be entered for the source IP address.
Source Subnet Mask	If DHCP is disabled, a subnet mask should be entered for the source subnet mask.

Name	Function
Source Gateway Address	If DHCP is disabled, a gateway address should be entered for source gateway address.
Test	Button visible only for newer model SimScopes. SimScope wirelessly connects to an access point while connected to the PC over USB. Useful for confirming settings and obtaining the IP address for pre-registration with the PC app.
Save	Saves the Wi-Fi settings to the SimScope.

❖ Wi-Fi Configuration Window (PC Application)

Below is a table explaining each setting under the PC Wi-Fi Connection Parameter heading (left column) found in the Wi-Fi Configuration Window (Figure 2, Page 13).

Table 3: PC Wi-Fi Connection Parameters

Name	Function
Registration Table	Table that contains the friendly name and serial number of all wireless devices recognized by the PC application.
Name	Column within the registration table listing the friendly name assigned to a SimScope or Bionic Hybrid Simulator. A name is easier to remember than a serial number.
Serial Number	Column within the registered SimScope table listing the unique number assigned to each SimScope. The matching serial number can also be found on SimScope rear label.
Remove	Deletes the name, IP address, and serial number of a wireless SimScope selected in the Registered SimScope list.
SimScope TCP Port	Visible only when a Wireless SimScope is connected via USB and *Show More>>* is clicked. Used to control the SimScope over Wi-Fi. The default port number is 14046. Value must match

Name	Function
	the TCP Port value found under SimScope Wi-Fi Configuration settings.
Cache Files	Enhances connection time for Wi-Fi Simscopes. Retrieves PC files copied during the last USB connection rather than sending files over Wi-Fi.
Time Out	Applies only to Wi-Fi SimScopes. Extends Wi-Fi SimScope shutdown timer by multiples of 90 seconds. Disabling the timer will force the SimScope to remain active until the application is closed or the SimScope battery is depleted.

Standardized Patient / SAM & PAT Basic Manikins

The SimScope can be used with Standardized Patient, SAM Basic and PAT Basic manikin products. If desired, a SimScope can have a library installed for each product making it more versatile.

Standardized patient interaction and assessment requires a standardized patient (actor) or manikin, location patches, SimScope, and a PC with the SimScope software.

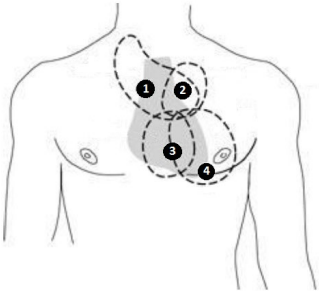
1. Run the PC Application and connect the SimScope USB to the computer.
2. Using the PC Application, pick sounds from the products Library and add them to the Selected Sounds / Scenarios by double-clicking them. Once the sound assignments have been selected and adjusted for desired volume click the save button to update the SimScope.
3. Refer to Figure 3 for the proper placement of the SimScope patches. On the protective cover of each patch is the name identifying the site. Peel off the protective cover to expose the adhesive tape and carefully place it on the actor or manikin skin. Note: The SAM and PAT Basic manikins come with location patches hidden permanently beneath the skin so extra location patches are unnecessary.

4. Setup is complete. Disconnect the USB from the SimScope and press any volume key to turn it on. Place the chest piece on any patch and the sound assigned in step 2 will begin playing.

Figure 3: Patch Placement for Standardized Patient/Manikin

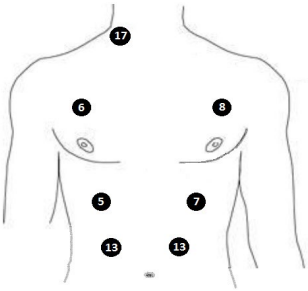
(Anterior Side)

(1) Aortic
(2) Pulmonic
(3) Tricuspid
(4) Mitral



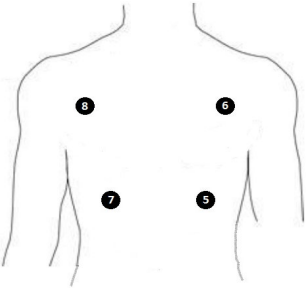
(Anterior Side)

(5) Lung Right-Lower
(6) Lung Right-Upper
(7) Lung Left-Lower
(8) Lung Left-Upper
(13) Bowel
(17) Bruit



(Posterior Side)

(5) Lung Right-Lower
(6) Lung Right-Upper
(7) Lung Left-Lower
(8) Lung Left-Upper



SimShirt and Bionic Hybrid Simulator Garment Care Instructions

The SimShirt and Bionic Hybrid Simulator is a wearable technology apparel and careful attention to cleaning is required. The electronic pulse pump assembly in the Bionic Hybrid Simulator garment must be removed before cleaning. Zippers along the sleeves and back of neck allow access for removal and installation of the pulse pump. The following is the laundry care instructions.

- Do not dry clean
- Do not iron
- Do not bleach
- Do not machine dry
- Do not wring
- Remove the pulse pump system before laundering the Bionic Hybrid Simulator model.
- Machine wash cool with gentle cycle
- Line dry only

SimScope and Bionic Hybrid Simulator Tech Pack Cleaning

The SimScope and Tech Pack can be cleaned using a standard alcohol swab or wipe (70% Isopropyl Alcohol). Do not use excessive liquid or immerse any part of the device. Doing so may result in moisture getting inside the unit.

Transport and Storage

The SimScope and Bionic Hybrid Simulator can be safely stored or transported without batteries with the following environmental conditions: 1°C – 50°C (33°F – 122°F), <95% relative humidity. Do not freeze.

Operating Conditions

- Operating Temperature: 10°C - 40°C (50°F - 104°F). Do not freeze.
- Humidity: 0 – 95% Relative Humidity
- Altitude: <6,561 Ft. (<2,000 Meters)

Limited Warranty

What this warranty covers

1. Cardionics warrants this product to be free of manufacturing defects in material and workmanship for a period of one (1) year from the date of original consumer purchase from Cardionics or an authorized dealer.
2. This written warranty is limited to the original consumer purchaser, transferable only by written authorization of Cardionics.
3. All warranties, expressed or implied, made by Cardionics, including warranties of merchantability and fitness are limited to the one (1) year period of this warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.
4. This warranty is limited to repair of the product or replacement thereof, at the discretion of Cardionics.

What this warranty does not cover

1. This warranty does not cover defects or damage resulting from use of the product other than its normal, intended and customary use. This warranty does not cover defects or damages from abnormal use, abnormal conditions, improper storage, exposure to moisture or liquid, unauthorized modifications, repairs made by unauthorized personnel, unauthorized connections (those not described in this manual), misuse, neglect, abuse, accident, alternation, improper installation or other acts which are not the fault of Cardionics, including damage caused by shipping.
2. Devices which have had the serial number removed or made illegible.

3. Damage resulting from use of non-Cardionics approved accessories.