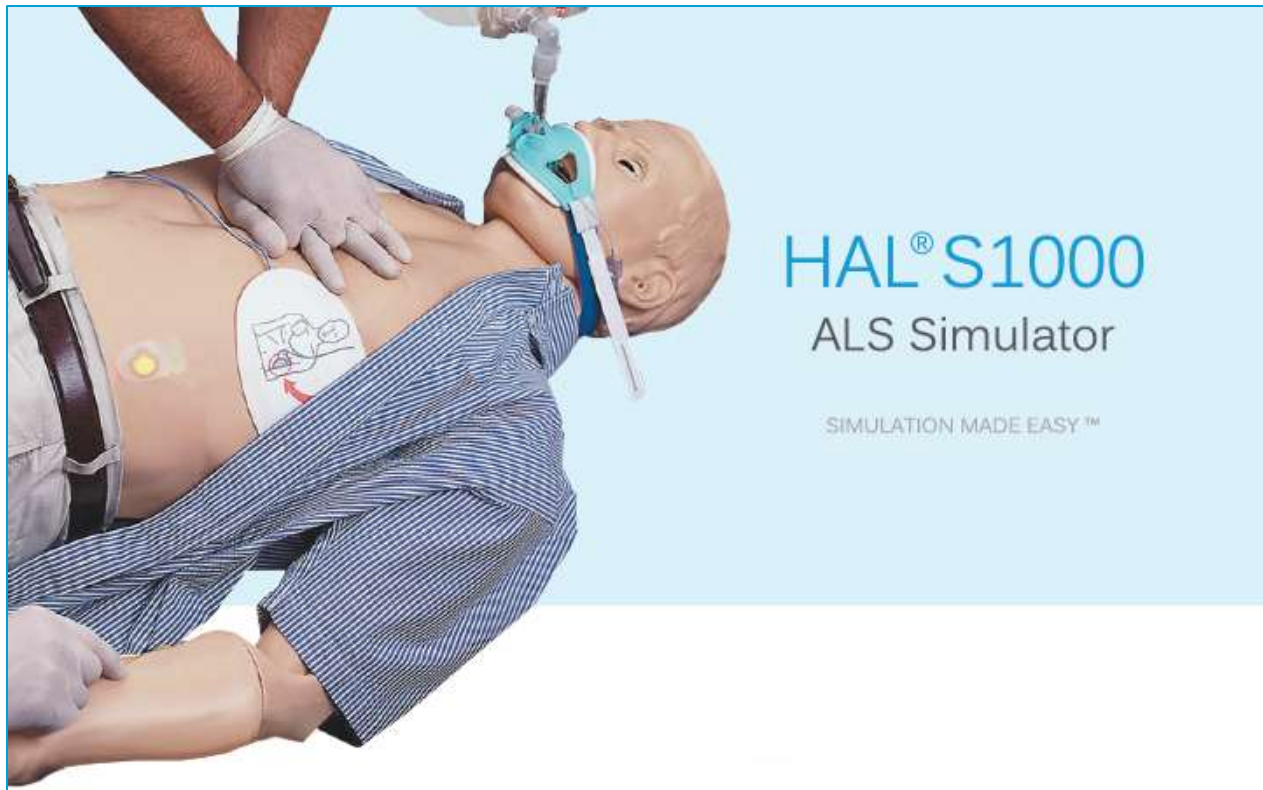


HAL[®] S1000 Instructional Manual

ALS Simulator

User Manual for HAL S1000 and GaumardUI



Gaumard[®]
Simulators for Health Care Education

Leadership Through Innovation

HAL is an interactive educational system developed to assist a certified instructor.
It is not a substitute for a comprehensive understanding of the subject matter
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User Guide version H.11.8.1
for GaumardUI v1.22.10.0
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II. Getting Started

A. Overview

Your HAL S1000 patient simulator is an advanced life support training simulator equipped with the following features.

Airway

- Oral or nasal intubation
- Tongue edema and laryngospasm
- Sensors detect depth of intubation
- Automatic unilateral chest rise with right mainstem intubation

Breathing

- Control rate of respiration and observe chest rise
- Ventilation is measured and logged
- Gastric distention with excess bag-valve-mask ventilation
- Select independent left, right lung sounds
- Multiple lung sounds are synchronized with selectable breathing patterns
- Accommodates assisted ventilation, including bag-valve-mask and mechanical support

Circulation

- Multiple heart sounds
- Chest compressions are measured and logged
- Blood pressure on left arm can be taken using palpation or auscultation via modified cuff
- Right (carotid/femoral) and left (carotid/brachial/femoral/radial)
- Pulses are continuous, synchronized with the ECG, even during a paced rhythm
- Bilateral IV training arms

Defibrillation and Cardioversion

- Apply real electrodes and AED pads
- Defibrillate, cardioversion and pace using real EMS equipment and see HAL ECG on your AED
- Program HAL response to defibrillation

File Sharing

- Provide students with images such as x-rays, CT scans, lab results, or even multimedia presentations

Other

- IO bone on left lower leg
- Streaming voice
- Virtual monitor

Included accessories

- Multimedia laptop 15" display
- Genuine Windows® 7
- 19" Monitor
- Streaming voice Headset
- RJ45 Communications Module
- RJ45 Cable

B. Terminology

It is wise to spend a moment familiarizing yourself with some of the terminology that will be used to discuss simulation with the HAL system.

Facilitator - the person conducting the simulation; an instructor or lab staff member.

HALUI - the HAL User Interface software application, used to control the manikin and evaluate care providers.

Palette Item - any full or partial set of physiological parameters that have been grouped and saved together under a single name.

Profile - a unique HALUI configuration, including custom Palette, Scenarios, and options. Each Profile acts as a separate program, in that changes made to one profile have no effect on the others.

Provider - a person participating in the simulation as a healthcare provider.

Scenario - a saved sequence of physiological states, like a "playlist." Scenarios provide a level of automation that unburdens the facilitator and allows standardized presentation of symptoms.

Scenario Item - a Palette Item that is part of a scenario. Scenario Items may also represent a fixed delay period ("Wait") or a pause ("Wait Indefinitely").

C. Equipment Set-up

1. Leg assembly

Remove the fixed bolts from the leg joint.



Position the lower leg and insert the joint bolt. Use the two provided hexagonal wrenches to tighten the knee bolts.

Warning: Do not over tighten the bolts.



2. Battery Connection

Connecting HAL's internal battery.

1. Locate the battery connectors on HAL's right hand side.



2. Gently lift the right corner on the chest skin as shown and connect the battery plugs.



3. Slide battery plugs into the cavity.



4. Secure the chest skin and connect the charger to the wall outlet.



3. Computer Set-up

Setting up HAL's control tablet and extended vital signs monitor.

1. Begin by locating the laptop's **power input** and **video output**.



2. Connect the laptop charger to the wall outlet.
3. Connect the Video cable to the laptop's video-out port and the other end to the monitor's video (VGA-IN) input.



4. Connect the monitor's power cord (AC-IN)

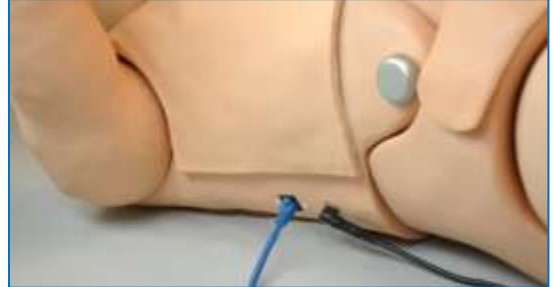


If the extended monitor does not display an extended image of the home screen, navigate to [VI.C.3](#) for instructions.

4. Communication Module

HAL is powered on via hardwired connection less than 1 minute after the GaumardUI software is initialized. Outlined below are the steps for connecting HAL to the control computer.

1. Connect the Ethernet cable to the communications port and the power adapter located on HAL's right side.



2. Connect the Ethernet cable to the USB communication module.



3. Finally, connect the communication module to an available USB port and power on the laptop and monitor.



The battery indicator will be visible on the GaumardUI's status panel once the software establishes a connection with HAL. For more information about the communication bars and battery indicator, refer to [IV.B.1](#)

Warning:

- Refer to the laptop's documentation for important information regarding use, charging and care prior to starting the system.
- Never disconnect the communications module while the GUI software is running. Doing so can seriously damage the module.

III. Manikin Features

List of HAL's available features:

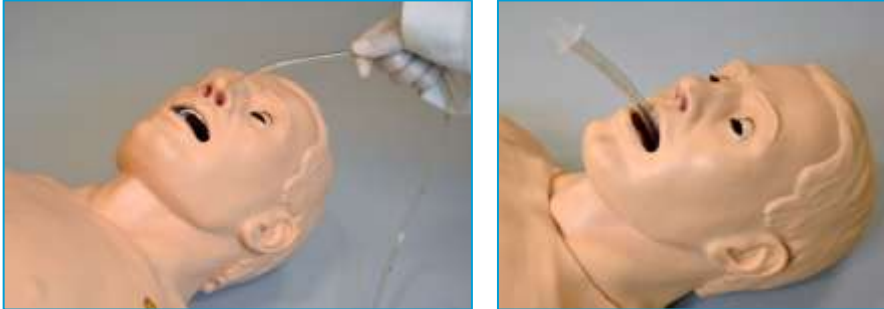
Category	Feature
Airway	Nasal intubation
	Airway intubation
	Airway complications: laryngospasm and tongue edema
	Intubation Sensor
	Airway sounds
Breathing	Respiratory patterns
	Lung sounds
	Unilateral chest rise with right mainstem intubation
	Pulmonary ventilation: BVM, mechanical
Cardiac	Heart Sounds
	ECG Monitoring
	Electrical therapy
Circulation	Bilateral pulses - right (carotid/femoral) and left (carotid/brachial/femoral/radial)
	Virtual blood pressure
	Bilateral IV arms
Systemic	Chest compression measurement and logging
	O ₂ SAT monitor placement detection
	Gastric distention
	Bowel Sounds
	Intraosseous access
Other	Streaming Audio
	Virtual vital signs monitor
	File Sharing

Disclaimer: The content of this table is subject to change without prior notice. Please contact Gaumard Scientific for the most current information.

A. Airway

a) Nasal and Oral Intubation

HAL's airway can be intubated both nasally and orally using LMA or endotracheal tubes, as shown in the figures below.



Warning:

- Do not introduce liquids when performing nasal and oral intubation. Doing so can **permanently** damage the system.
- Always lubricate tubing, airway and nasal opening prior to performing any nasal or oral intubation.

Procedure	Recommended Device Size
Intubation (Blade size)	Miller 4 or MAC 3.5
LMA	Size 4
Nasal Intubation	8 mm outer diameter max
Oral Intubation	ETT 7 or 7.5

b) Airway Complication

Intubation can be made more difficult by turning on laryngospasm and tongue edema.

c) Intubation Sensor

Once intubated, sensors detect the depth of the intubation tube. If the tube is inserted too deep, the left lung is automatically disabled realistically demonstrating right mainstem intubation. Correcting the tube position enables the left lung.

d) Airway Sounds

HAL has multiple upper airway sounds synchronized with his breathing: normal, stridor inspiratory, stridor expiratory, and stridor biphasic.

B. Breathing

a) Breathing Patterns

Users can easily control rate and depth of respiration; and choose independent left, right, upper lung sounds, which are synchronized with selectable breathing patterns: Kussmaul's, Cheyne-Stokes, Biot's, apneustic, apnea, and normal.

b) Lung Sounds

Multiple lung sounds are available: Normal, wheezing, inspiratory squeaks, crackles and rales.

c) Unilateral chest rise

The right and left lung can be disabled individually.

d) Ventilation

HAL can be ventilated with a BVM or mechanical ventilator.

Warning: Do not perform needle decompression. Doing so will damage the simulator and will void the warranty.

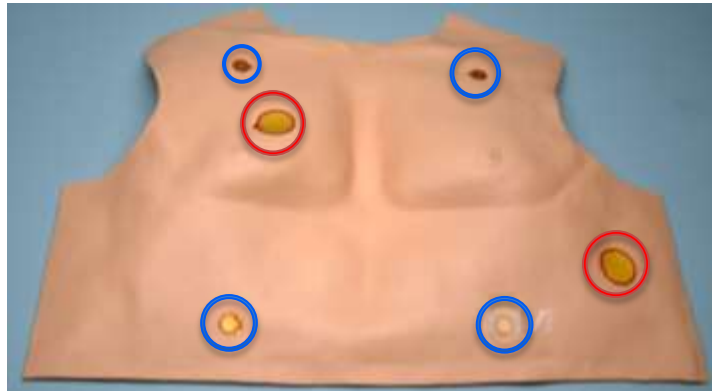
C. Cardiac

a) Heart Sounds

HAL is equipped with several realistic heart sounds (normal, distant, systolic murmur, S3 and S4) which are tied to a user defined heart rate and selectable rhythms.

b) ECG Monitoring and Electrical Therapy

Defibrillation is only allowed on the large sternum and apex sites, circled in **RED** below. NEVER deliver a shock to ECG electrode targets on the shoulders or waist, marked **BLUE**. Doing so will not create a fire hazard, nor is there risk of shock to the provider, but internal damage in HAL may result. This situation is considered improper use and is NOT covered by the HAL warranty. The system will require repair at our facility.



There are inherent dangers in the use of some medical devices. For simulations that incorporate electrical therapy of any kind, always know your equipment, and follow the device manufacturers' safety guidelines.

ECG and electrical therapy checklist and warnings:

- Only deliver electrical therapy when the simulator is fully assembled, dry, and undamaged.
- Make sure the defibrillation patches on the simulator are in good condition, including removing any and all gel residue on the defibrillation patches from previous use(s). It is a good practice to remove gel residues after every use. Failure to do so will leave behind a film of electrode gel that hardens causing arcing and pitting.
- Do not re-use the gel-adhesive pads. Do not leave them on for next day use.
- Use hard paddles or wet-gel pads preferably. Avoid using solid-gel pads since they present higher risk of burning the simulator's skin.
- Gel pads have a shelf life. Make sure they are not expired to avoid arcing.
- Make sure the simulator is not in contact with any electrically conductive surfaces.
- Use the simulator only in a well-ventilated area, free of all flammable gases.
- NEVER attempt to service or modify any of the electrical connections, especially those between conductive skin sites and the internal electronics. Discontinue use if any wires are found exposed with damaged insulation. Real medical products, especially electrodes, sometimes use powerful adhesives that can be difficult to remove. A gentle, degreasing cleanser may be needed. Refer to Care and Cautions for more information.
- Electrode gel on the skin between any two electrode targets can become a pathway for electrical current, just as in real life. If this occurs, HAL's skin can be burned.
- Do not allow defibrillation pads to overlap ECG sites. Doing so will may damage the simulator and cause arcing.

Refer to section [V.B](#) of this manual for detailed instructions and warnings on the use of this feature.

D. Circulation

a) Bilateral Pulse

HAL's is equipped with right (carotid/femoral) and left (carotid/brachial/femoral/radial) dependent on blood pressure and synchronized with the ECG. Users can also disable distal left radial pulse to simulate severe hypotension

b) Programmable Blood Pressure

Programmable blood pressure can be measured on the left arm using the modified sphygmomanometer. Korotkoff sounds are heard between systolic and diastolic.

To use this feature:



- Put the cuff around the simulator's upper left arm with the cuff mark at the medial site of the bicep brachii, about an inch (two cm) above the anterior elbow, which is the correct site when taking the blood pressure on real patients.
- **Warning:** Placing the cuff any differently might give an incorrect reading.
- Calibrate the BP arm, if it has not been calibrated. Refer to Section [IV.C.2.a\)\(2\)](#) for information on how to calibrate.
- Inflate the BP cuff, and auscultate Korotkoff sounds as you would a normal patient.



Modified BP port for Virtual BP system

Connect the Luer-Lok fitting on the end of the extra branch to the Luer-Lok port on HAL's left shoulder. Some facilitators prefer to make this connection before commencing a simulation session.

c) Bilateral IV arms

HAL is equipped with bilateral IV training arms that can be used for bolus or intravenous infusions as well as drawing fluids.



Warning

- Do not attempt to fill IV system without the drain connector in place .
- Always leave the drain port connected when injecting fluids into the system.
- Use **only** Gaumard's provided simulated blood. Any other simulated blood brand containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

1. First, locate the fill syringe with tubing and the drain tube with pinch-clamp. Fill the syringe with the desired fluid -- water or simulated blood.



2. Connect the fill syringe to one port and the drain tube to the other port as shown.



3. Leave the drain tube clamp opened and depress the syringe until all air has been pushed from the IV system and fluid runs from the drain. Repeat the procedure for the other arm.



To simulate a patient with no accessible peripheral IV sites, connect only the syringe. Pull the plunger to create suction, which will collapse the veins. Disconnect the syringe tube from the arm port while maintaining suction. The port will seal, and the veins will remain collapsed.

E. Systemic

a) Bowel Sounds

Bowel sounds are controlled through the software and heard from the abdominal area.

b) Intramuscular Injection Sites

IM sites on both deltoids and quadriceps for placement exercises.

Warning: Do not inject fluids into the intramuscular sites.

c) Gastric distention

The bloating of the stomach when HAL is improperly intubated or excessive ventilation.

d) Intraosseous Access

I/O access is used for the infusion of fluids, blood and/or drugs directly into the bone marrow of the tibia or other large bone. Setting up an intraosseous access line is an invasive procedure that can be simulated with HAL.

The following procedure describes how to use the I/O access feature:

1. Remove skin from the leg to access the two part tibia.



2. Remove lower half of the tibia.



3. Fill the upper and lower half of tibia with fluid.



4. Replace tibia bone in the leg.



5. Replace skin and palpate tibial tuberosity.



6. Insert bone aspiration needle below tibial tuberosity. Note the sharp decrease in needle resistance as it passes into the bone marrow cavity. Remove stylet, aspirate bone marrow, and infuse fluids.

Warning: Always drain and flush the reservoirs after simulation.



e) O₂Sat Monitor Placement Detection

HAL can detect the placement of an O₂Sat monitor on the left index finger. Once the O₂Sat monitor is detected, the Virtual Vital Signs software will display the O₂Sat value programmed by facilitator. Please note that a reading will not be available on the O₂Sat monitor itself.

F. Other

a) Streaming Audio

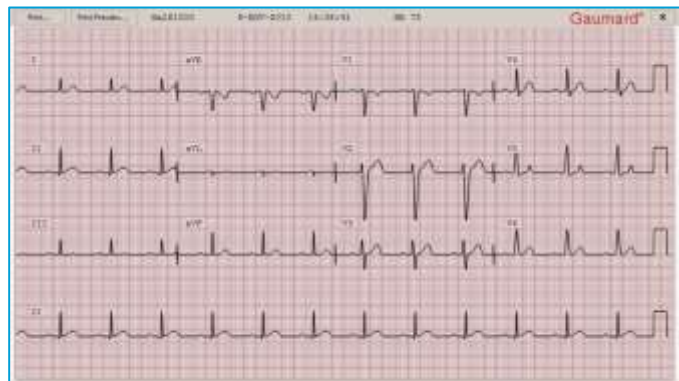
This feature allows the facilitator to be the voice of the simulator, listen with headsets to any discussions occurring near the simulator, and record voice commands in any language. For information about how to use this feature, go to [VI.C.2](#)

b) Virtual Vital Signs Monitor

The Gaumard Vital Signs Monitor simulates vital sign monitoring equipment. Each trace can be customized independently of each other; users can set alarms, time scales, boundaries and grid options. In addition, it allows the facilitator to display lab reports, x-rays and other files on the Virtual Monitor screen for use by the provider.



To access the 12 lead ECG strip, navigate to the M menu located on the top right screen of the Virtual Monitor screen.



For information on how to setup the extended display to enable the Virtual Monitor, please refer to the Appendix, [IV.C.3.d](#))

IV. Working with GaumardUI

A. Start-up

1. Initializing HAL

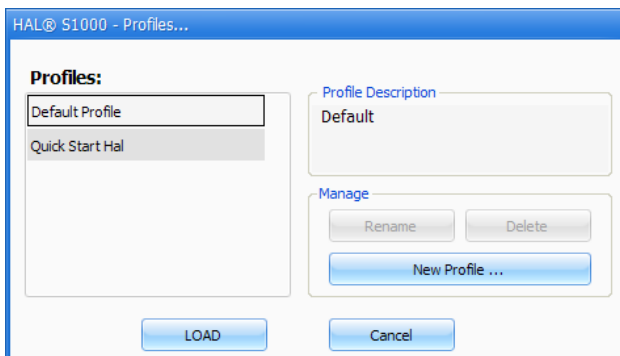
To start the simulator, click on the GaumardUI icon on the home screen of your laptop computer. HAL will power on less than 1 minute after activating the software. For information on resolving connectivity issues, please navigate to [VI.C](#)



2. Profiles

A profile is a unique configuration of customized Palettes, Scenarios, and Options. Each profile functions independently, in that changes made to one profile have no effect on the others.

When starting the GaumardUI follow the prompt selection.



The profiles available are the following:

Default Profile – includes one palette with healthy vital signs. When creating a new profile, it is often useful to include the Default profile contents and begin customization from that foundation.

Quick Start HAL– includes a total of eleven scenarios and is the recommended profile for first time users.

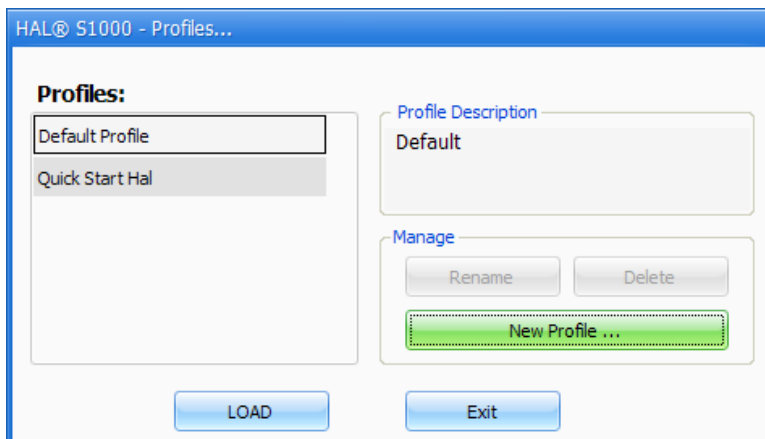
For an overview of the preloaded scenarios, go to [VI.A](#)

Profiles are used to organize and protect software settings. Below are some examples on how to use the profile functionality.

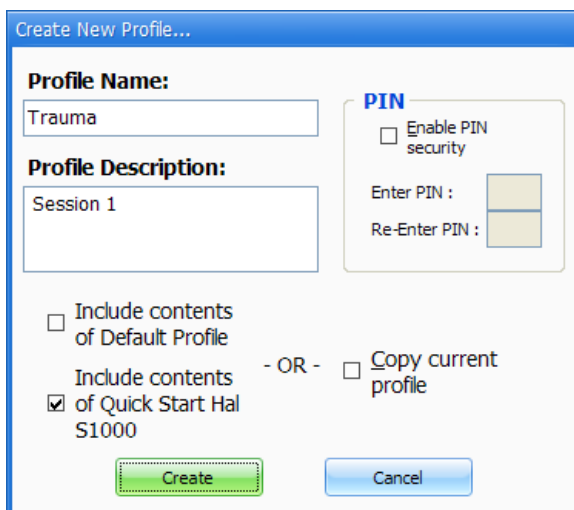
- It may be appropriate to assign one profile to each user of the HAL system.
- Others may choose to create a profile dedicated to a specific academic course, which might be taught by multiple instructors.
- For the most detailed exercises, it is sometimes useful to devote an entire profile to one particular subject area, or even one particular scenario.

New Profile

To create a user made profile, click on the New Profile button on the right panel.



Enter a name for the new profile followed by a description.



To include scenarios and palettes from other profiles, click the applicable check box. For security, enable PIN protection, which will require a user to enter a four-digit key before loading the protected profile.

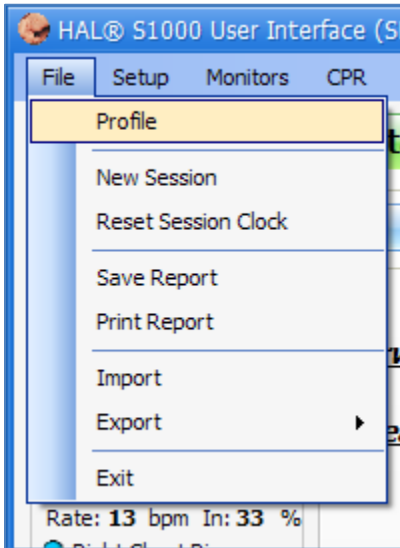
To import and export profiles, navigate to [IV.C.1.g](#)

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When starting out with HAL, it is recommended to use the *Quick Start Scenarios* profile, which was created in conjunction with experienced healthcare instructors and working medical professionals. See the Factory Preset Profiles appendix for detailed description of the Quick Start Scenarios profile.

The Quick Start HAL profile has applicable Palettes that are useful for simulating common medical emergencies. For many applications, it serves a convenient starting point that can be customized to fit most simulation objectives.

To access the Profiles dialog box at any time, select Profiles from the File drop-down menu:



Note: The profile name is displayed atop of the GaumardUI window.



B. The Environment

1. Status

a) The Status Panel

The Status panel is visible along the left edge of the GUI window at all times. The vital signs and other details of the simulated patient are shown here. The battery and connection indicators are also shown in this panel on the upper right corner.

The Status panel is a vertical sidebar on the left side of the GUI. It is titled "Status" and contains several sections for monitoring patient vital signs and system status. At the top right of the panel, there are icons for signal strength (three bars) and battery level (a battery icon). The panel is divided into sections: **Airway**, **Breathing**, and **Circulation**, each with a corresponding anatomical icon. Under each section, there are status indicators (radio buttons) for various features. Some features are active (indicated by a light blue dot), while others are inactive (indicated by a dark grey dot). The status of each feature is displayed in a box (e.g., "normal", "none", "Sinus"). There are also volume control sliders for sounds associated with each section. At the bottom, there are other vital signs like temperature and blood pressure. Annotations with lines point to specific elements: "Inactive feature" points to "Tongue Edema" and "Laryngospasm"; "Active feature" points to "Right Chest Rise" and "Left Chest Rise"; "Value undergoing change" points to the heart rate value "80 bpm"; "Battery indicator" and "Signal strength" point to the top right icons; and "Volume controls" points to the sliders on the right side of the panel.

Status

Airway

- Tongue Edema
- Laryngospasm
- Throat Sound: **normal**

Breathing

- Resp. Pattern: **normal**
- Rate: **13** bpm In: **33** %
- Right Chest Rise **normal**
- Left Chest Rise **normal**
- (O2-Sat **98** %)
- (EtCO2 : **40** mmHg)

Circulation

- Cardiac Rhythm: **Sinus**
- Heart Rate: **80** bpm
- Sinus arrhythmia
- Heart Sound: **normal**
- Blood Pressure: L **120 / 80** mmHg
- Absent Pulses: Radial: L

Other

- Bowel Sound: **none**
- (Temperature **99.5** °F)

Light blue icons display active features. Specific values undergoing changes are highlighted in yellow. Click on the volume bars located on the right to adjust the volume of each sound.

Airway

This section displays the status of various airway controls: Tongue edema and laryngospasm. There are two possible states for these controls, black and blue. The black state indicates that the feature is turned off (inactive); and blue indicates that it is turned on (active). This section also displays the throat sound. Sound volume can be adjusted from the status panel.

Breathing

The Breathing section shows detailed information related to respiration. Note that "O2-Sat" is in parentheses, because it is only a "virtual" vital sign that cannot be evaluated on the manikin. This information serves as a reference for the facilitator.

Circulation

The circulation section displays HAL's cardiac parameters.

Other

This section includes additional information about the simulator (temperature and any other additional feature installed in the simulator).

b) Connection Indicator



The indicator is clear when no attempts to communicate with the manikin are being made; for example when the module is not connected to the computer or the system is in STAND-BY mode.

Full bars indicate excellent communication between the computer and the manikin (i.e., normal operation).

c) Battery Indicator

The power status indicator progresses as the internal battery in the manikin is used.



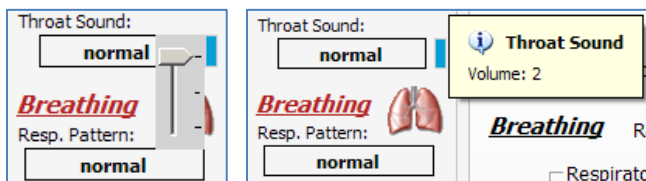
The exclamation mark indicator is shown when there is no communication with the manikin and the program cannot provide the battery information.

When the battery is so low that the indicator turns blinking red, the manikin is sent automatically to STAND-BY mode (to protect some of the manikin's internal components) and will not operate until the manikin is reconnected to a power source.

Always operate HAL connected to the power outlet supply. The internal battery provides temporary power in the case of outage.

d) Sound Volumes

The volume of each sound can be adjusted from the Status Panel. Click on the volume level indicator next to each sound and a volume control will pop-up. Simply select the volume level you want and the sound will be adjusted instantly on the manikin (i.e., there is no need to click "Apply").



e) Soft Power

It is important to note that HAL uses what is called "soft power," which means that the manikin is activated from the software. It is very important to understand the behavior of the soft power feature, described below.

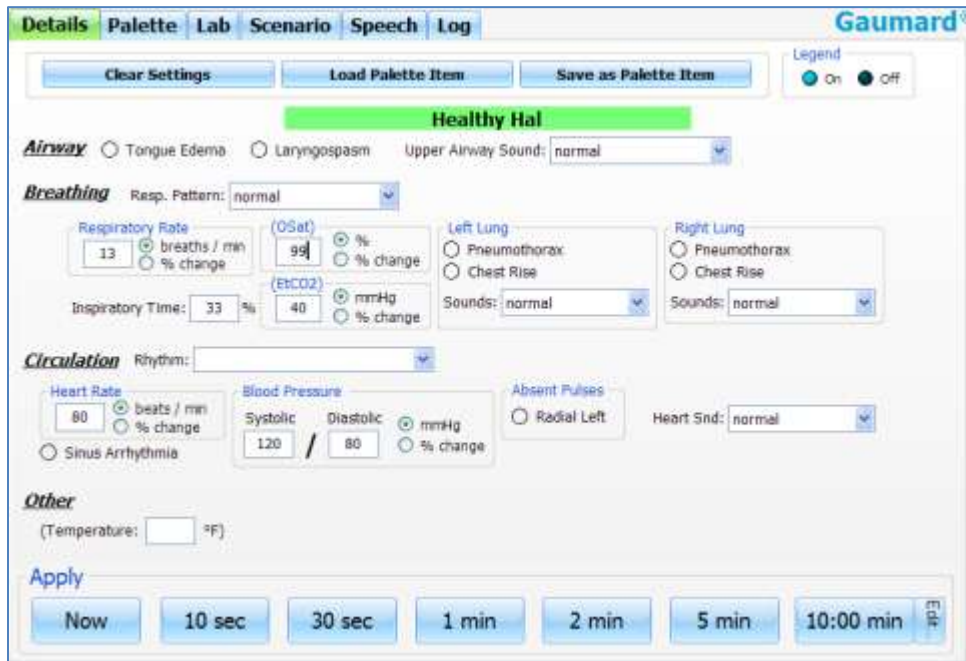
The standby button is located on the bottom right corner of the GaumardUI software.



When the battery is connected, HAL is always in **SLEEP** mode. HAL will automatically wake up in the **ON** mode less than 1 minute after starting the software.

2. Details

It is best to think of controlling the simulator in terms of three levels of complexity: Firstly Details, then the Palette, and finally Scenarios. The Details page is the first of the tab-pages found in the main area of the HALUI window. This is the simplest form of control available to the facilitator. Note that, for each item in the Status panel, there is a corresponding field or control on the Details page.



Choose the settings you wish to change from the available fields and click one of the "Apply" buttons below. New settings will be applied over the time period indicated by the button's label. Click the "NOW" button to change HAL's condition instantly, or click one of the other "Apply" buttons to create a trend. It is very important to note that those settings that you do not specify will remain unchanged.

Some settings are always applied immediately, such as cardiac rhythm and breathing pattern, while numerical settings, such as heart rate and respiratory rate, can be easily made to transition gradually (linearly) from their current values to any target you specify. The last apply time button can be customized to any transition time you require by clicking the part of the button labeled "Edit".

As transitions are applied, the time remaining in the transition is displayed in the Clocks panel at the bottom of the HALUI window.

If there is already an ongoing transition at the moment you click an Apply button, it will stop, and a new transition will begin from the current physiological state.

Warning: Some of the parameters in the "Details" tab might change with your manikin depending on the accessories that are currently installed.

The **Details** page is also used to create Palette Items. A Palette Item is any full or partial set of physiological parameters that have been grouped and saved together under a single name. Palette creation is an essential part of building scenarios later covered in this section.

To create a Palette Item, choose the desired parameters on the Details page and click the "Save as Palette Item" button near the top of the page. You will be prompted to name the palette, specify a description, and select a color to label it, as show below:

Navigate to the palette tab to view a list of all the palettes created using the details tab.

a) Airway

The **Airway** section displays controls for Tongue Edema, Laryngospasm and Upper Airway Sounds.

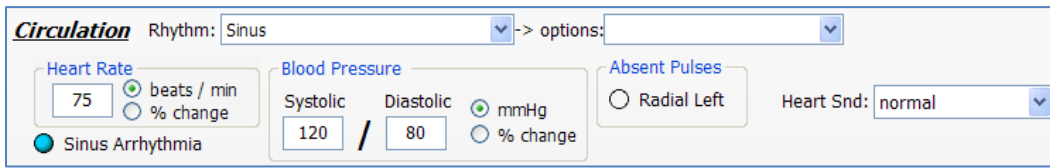
To enable tongue edema or laryngospasm, click on the control button to activate the feature then apply. To disable a feature, click once to darken the circle and then apply changes.

b) Breathing

The **Breathing** controls include Respiratory Pattern, Respiratory Rate, OSat, EtCO2, Left Lung, Right Lung and Inspiratory Time.

c) Circulation

The **Circulation** section includes

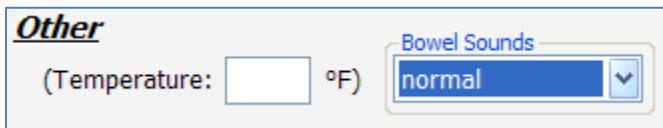


Note that:

- Each cardiac rhythm has a specific effect on the blood pressure wave forms. The pressure wave forms include ABP, CVP, PAWP and Pulse.

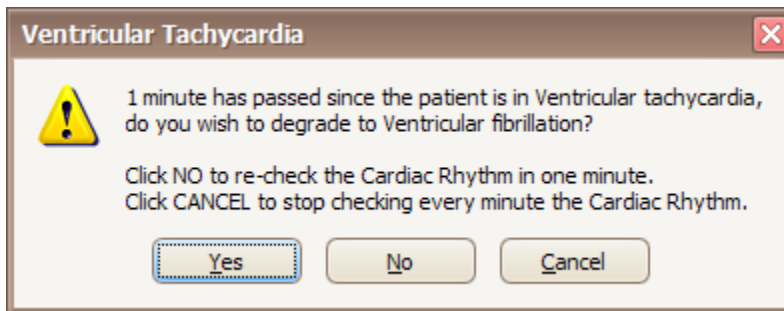
d) Other

Miscellaneous controls include the following:



Ventricular Tachycardia Warning:

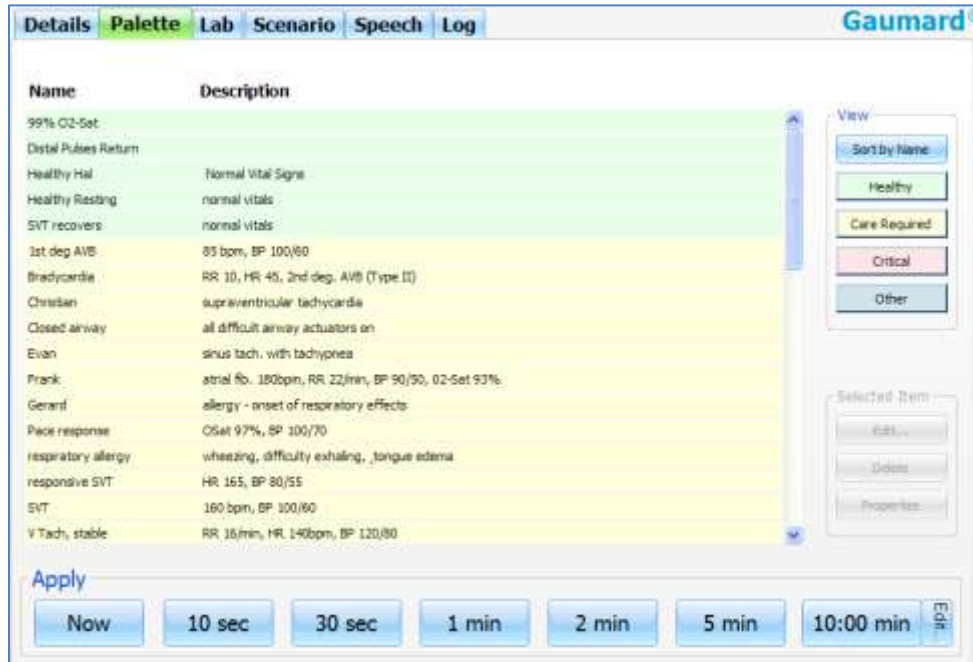
If the cardiac rhythm is maintained at Ventricular Tachycardia for one minute, the following prompt dialog box will be displayed:



Clicking "Yes" degrades the cardiac rhythm to ventricular fibrillation. Clicking "No" does not degrade the cardiac rhythm but re-checks the rhythm after a minute. Clicking "Cancel" stops the software from checking the cardiac rhythm every minute.

3. Palette

Each item on the Palette represents a complete or partial physiological state. It displays all of the Palette Items in the active profile. Each profile has its own separately customizable Palette. Recall that you can create Palette Items using the Details page.



Apply Palette Items using the buttons at the bottom of the page, exactly as changes to HAL's condition are applied on the Details page. Change HAL's vital signs and symptoms instantly by clicking to select a Palette Item and clicking the "NOW" button. Or, create a gradual transition in physiological state with one of the other "Apply" buttons.

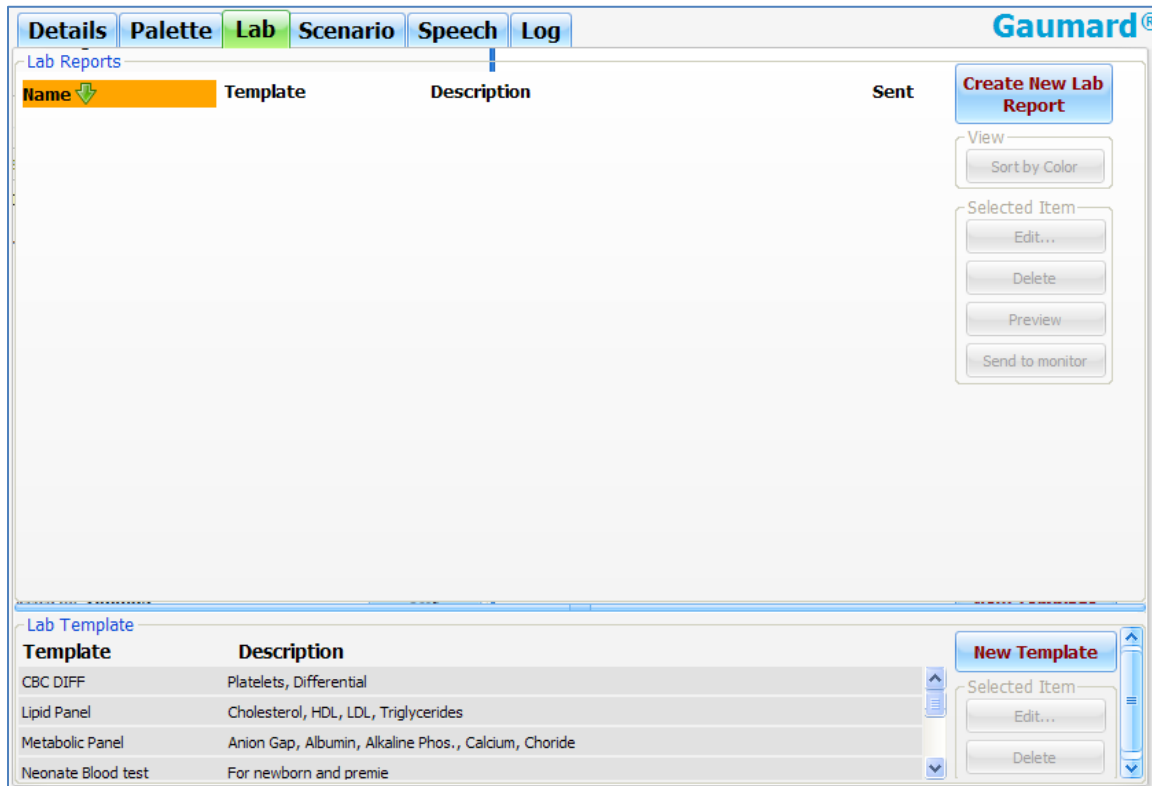
Palette Items can be sorted with the "View" buttons found on the right side of the page.

Editing existing Palette Items is simply a matter of selecting the item you wish to modify and clicking the Edit button. You will be automatically be taken to the Details page, and the settings that comprise the selected Palette Item will be displayed. Change them as desired, and click the "Save as Palette Item" button.

Many of the functions related to Palette Items are also available by clicking the second mouse button (usually the right button) while the pointer is positioned over an Item.

4. Lab

Laboratory tests are helpful tools for evaluating the health of a patient. To simulate this process, the Lab Tab allows the facilitator to create laboratory reports to aid providers during simulation. Once a laboratory test is created, the facilitator can display the results on the Virtual Monitor window for the provider to utilize.



The Gaumard Virtual monitors must be connected before using the file sharing feature. To verify the connection navigate to [IV.C.3.d\)](#)

a) Creating a Lab Template

To begin, navigate to the bottom of the tab and click on the **New Template** button on the right panel.

Template	Description
CBC DIFF	Platelets, Differential
Lipid Panel	Cholesterol, HDL, LDL, Triglycerides
Metabolic Panel	Anion Gap, Albumin, Alkaline Phos., Calcium, Chloride
Neonate Blood test	For newborn and preemie

The **Edit Lab Results Template** window is used to create templates that will be later used to create lab reports. Enter a **name** for the lab template followed by a **description**.

Categories are used to group a series of tests in a lab report. From the **Category** box, click **Add** to name and create a category. Then, click **OK** to save the new category.

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Use the **Single Entry** menu to add a test under the category previously created.



Use the **Add/Edit Entry** menu to customize the different parameters on a specific test. Begin by providing the name of the test, unit and decimal precision. The **Normal Range** will be displayed on the lab report for the provider to use as guide while reading the results. Meanwhile, the **Allowed Range** restricts the minimum and maximum value a facilitator can input as a test result. Once the test entry is configured, click **OK** to add the test.



Repeat the process to add more tests and categories using the Category and Single Entry menu. Please note that individual items can be moved, deleted or modified after they are created. Navigate to the bottom of the page to **Save** the new category.

Name: Lipid Panel

Description: Cholesterol, HDL, LDL, Triglycerides

Category
Add Remove Rename Insert ▲ ▼

Single Entry
Add Delete Edit Insert ▲ ▼

Lipid Panel - Female

Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	35.00--85.00		
Cholesterol/HDL(Ratio)	0.00--4.40		

Lipid Panel - Male

Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	29.00--71.00		
Cholesterol/HDL Ratio(Ratio)	0.00--4.90		

Lipid Panel - Both

Variable	Normal Range	Value	Comment
Cholesterol(mg/dL)	0.00--199.00		
LDL Cholesterol(mg/dL)	0.00--129.00		
Triglycerides(mg/dL)	30.00--200.00		

*Allowed value range is displayed in Value column. It won't be visible when entering data.

Save Cancel

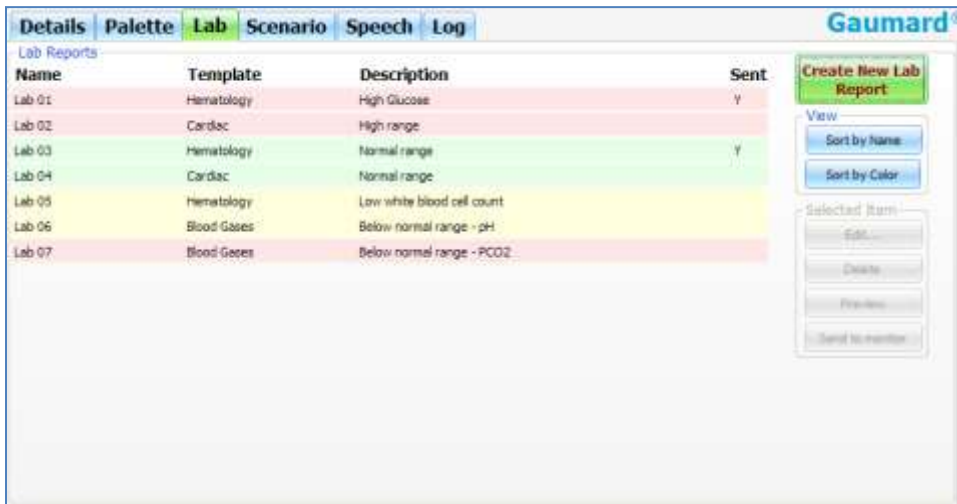
Once a new template is created, it will be listed on the Lab Format section at the bottom of the Lab tab. Use the buttons on the left panel to edit or delete lab formats.

Template	Description
CBC DIFF	Platelets, Differential
Lipid Panel	Cholesterol, HDL, LDL, Triglycerides
Metabolic Panel	Anion Gap, Albumin, Alkaline Phos., Calcium, Chloride
Neonate Blood test	For newborn and zebrae

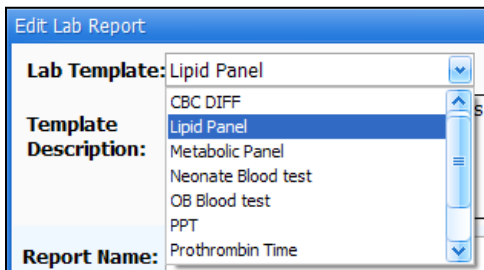
New Template
Selected Item
Edit...
Delete

b) Creating a Lab Report

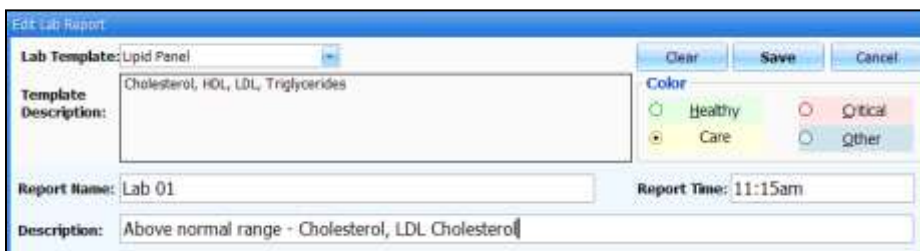
To begin, click on **Create a New Lab Report** from the right panel.



The **Edit Lab Report** window is used to prepare new lab report. First, select a **Lab Template** from the drop down menu.



Provide a **Report Name**, **Report Time** and **Description**. In addition, select a condition color tag for the lab report on the right panel. Color tags aid the sorting of lab reports on the report list window.



Input the results of the tests on the **Value** column. Values above the normal range specified will be displayed in bold. Include any comments associated with the test performed. Finally, click **Save** from the top right menu to create the lab report.

Description: Above normal range - Cholesterol, LDL Cholesterol

Lipid Panel - Female			
Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	35.00--85.00		
Cholesterol/HDL Ratio	0.00--4.40		

Lipid Panel - Male			
Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	29.00--71.00	85.00	
Cholesterol/HDL Ratio(Ratio)	0.00--4.90	5.10	Care required

Lipid Panel - Both			
Variable	Normal Range	Value	Comment
Cholesterol(mg/dL)	0.00--199.00	190.00	
LDL Cholesterol(mg/dL)	0.00--129.00	135	
Triglycerides(mg/dL)	30.00--200.00	100	

The newly created lab report will be listed on the Lab Reports list and can be sorted by name, template, description, status or color tag.

Name	Template	Description	Sent
Healthy 2	OB Blood test	Healthy Levels	
Healthy	Neonate Blood test	Healthy Levels	
James	Metabolic Panel	Session 1	
Susan	Lipid Panel	Session 4	
Lab 01	Lipid Panel	Above normal range - Cholesterol, LDL Cholesterol	
Lab 04	CBC DPP	Simulation 1	
Lab 02	CBC DPP	High levels	
Lab 03	Neonate Blood test	High levels	
Lab 05	OB Blood test	Session 2	
Lab 06	PPT	Session 2	

Select a lab report and click the **Preview** button on the right panel to view the report on the facilitator's screen. From the Lab Preview window, the facilitator can print as well as send the report to the virtual monitor computer. To make changes, click **Close** and then **edit**.

Lab Preview

Send to VM Print Close

Lab 01

Report Time: 11:36am
Description: Above normal range - Cholesterol, LDL Cholesterol

Lipid Panel - Male			
Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	29.00--71.00	85.00	
Cholesterol/HDL Ratio(Ratio)	0.00--4.90	5.10	Care required

Lipid Panel - Both			
Variable	Normal Range	Value	Comment
Cholesterol(mg/dL)	0.00--199.00	190.00	
LDL Cholesterol(mg/dL)	0.00--129.00	135.00	
Triglycerides(mg/dL)	30.00--200.00	100.00	

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c) Send to Monitor

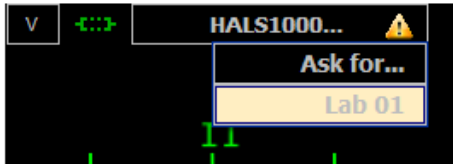
Begin by selecting the report from the lab reports list.



Click the **Send to Monitor** button to transfer the lab report to the Virtual Monitors.



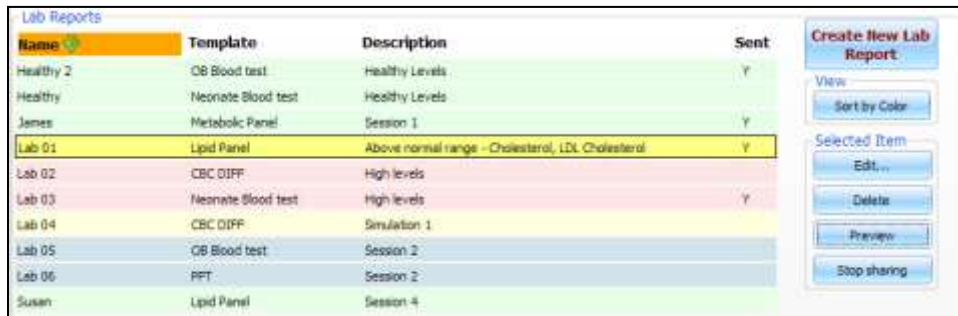
On the Virtual Monitor's window, an exclamation icon notifies the provider a file is ready for access. Click the HAL drop down menu to select the available lab report.



The lab report will open using the system's default application.



Once the report is sent, the letter Y will be present on the Sent column. Use the Stop Sharing button on the right panel to remove any items on the virtual monitors file list.



The screenshot shows a 'Lab Reports' interface. On the left is a table with columns: Name, Template, Description, and Sent. On the right is a control panel with buttons for 'Create New Lab Report', 'View', 'Sort by Color', 'Selected Item', 'Edit...', 'Delete', 'Preview', and 'Stop sharing'.

Name	Template	Description	Sent
Healthy 2	OB Blood test	Healthy Levels	Y
Healthy	Neonate Blood test	Healthy Levels	
James	Metabolic Panel	Session 1	Y
Lab 01	Lipid Panel	Above normal range - Cholesterol, LDL Cholesterol	Y
Lab 02	CBC DIFF	High levels	
Lab 03	Neonate Blood test	High levels	Y
Lab 04	CBC DIFF	Simulation 1	
Lab 05	OB Blood test	Session 2	
Lab 06	PFT	Session 2	
Susan	Lipid Panel	Session 4	

An editable copy of the lab report is also copied onto the Gaumard_UI folder on the tablet's home screen

For information on how to access other files from the Gaumard Monitor screen, navigate to [Section IV.C.3.b\)](#)

5. Scenario

The most advanced method of controlling the HAL system is to build a Scenario, a sequence of Palette Items and delay periods. This is done on the third tab-page in the GUI window.

The best way to think of a scenario is like a "playlist" of palette items. Consistent with this analogy, scenario controls at the bottom of the page look and behave just like traditional and software-based media players.

Scenarios let the facilitator automate most of the changes to HAL's condition, so that their attention can remain on the providers' actions. The scenario system can also provide standardization of the patient's presentation of symptoms. For fair assessment of providers and any research application, such standardization is key.

Scenarios can be linear or branching. The sections that follow explain in detail the difference between the two.

a) Linear Scenarios

Linear scenarios consist of palette items added in sequence with specific transition times as shown in the figure below.

Details **Palette** **Lab** **Scenario** **Speech** **Log** Gaumard®

Clear Load Scenario... Save Scenario... Scenario Auto-Responses... Go to Branching Scenario

Brent 55-year old male complains of substernal chest pain radiating to the jaw. Patient is diaphoretic, trembling, and has a waxing and waning mental

Name	Transition	Description
Brent	00:00	V. Tach. 180bpm, BP 70/40
BP -30%	03:00	30% reduction in blood pressure
Wait Indefinitely	...	electrical therapy expected
SVT	00:00	160 bpm, BP 100/60
Wait	00:15	No changes are made to HAL
V Tach, stable	00:15	RR 16/min, HR 140bpm, BP 120/80
Wait Indefinitely	...	drug therapy expected
Healthy Resting	00:25	normal vitals

Selected Item

Move

Edit Transition

Insert...

Remove

Duplicate

Properties

Edit Palette

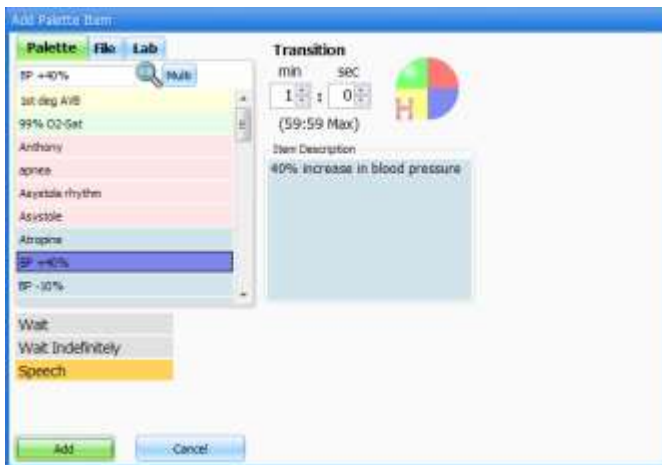
Print Scenario

Stopped

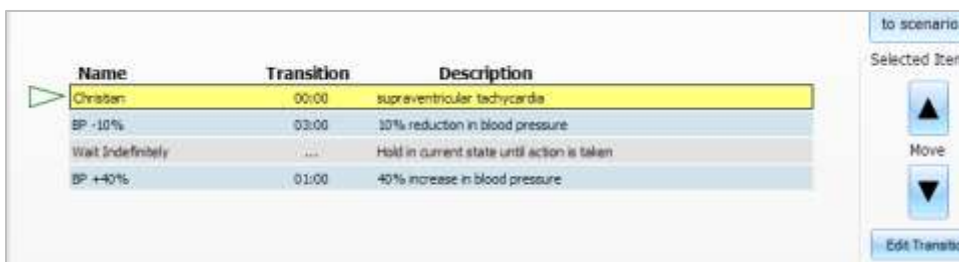
To add palettes to the Scenario, click on the "Add to scenario" button located on the right.



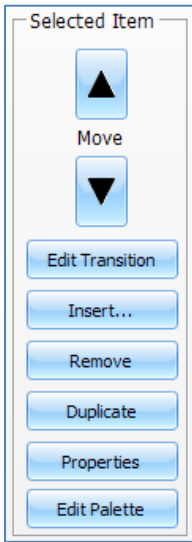
Use the add palette item window to add Palettes, files and labs. Choose the desired palette and specify a transition time. If the list of palettes is long, you may search a desired palette using the search bar next to the search icon. To select multiple palettes at one time, enable the Multi control button. The palettes selected will be shown on the right panel.



Repeat the process to add more palettes to the scenario.

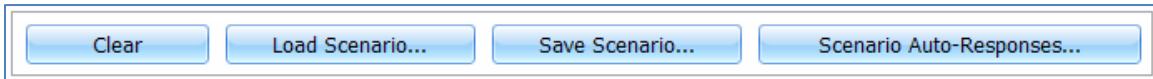


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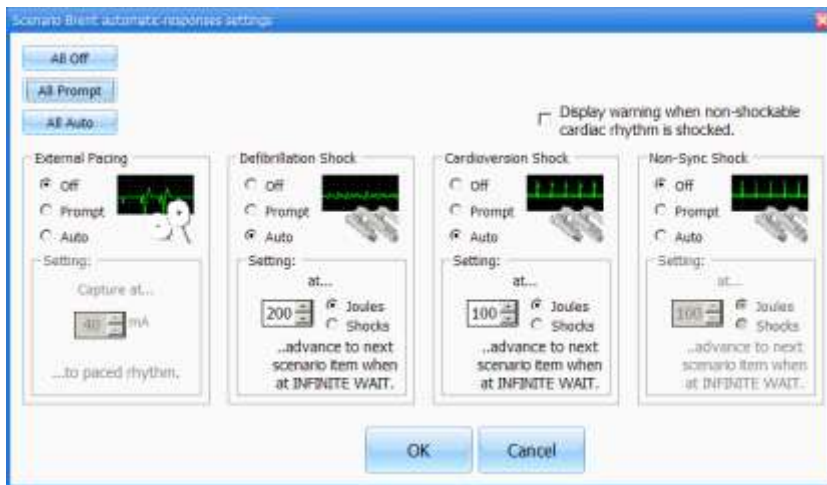


After a palette is added, you may select it to move it up and down from the list using the arrows. You may also edit the transition time, insert a new palette, remove or duplicate the palette, or check the properties using the buttons on the "Select Item" panel shown in the figure below.

The buttons found on the top panel can be used to clear any palettes listed on the scenario page, load or save a scenario, program settings for electrical therapy, and switch from linear to branching scenarios.



Note: Unlike the Non-Scenario Auto Responses dialog box described in [IV.C.2.c](#)), setting shock therapy to "Auto" does not convert the vital signs to a pre-selected palette, rather, it advances the scenario to the next palette item. Please note that it will **only** advance to the next palette if the shock is applied while a "wait indefinitely" palette is being played.



(1) Scenario Controls

Scenarios are controlled from the buttons at the bottom of the Scenario page. The same way a music player plays songs, the Scenario plays palette items. Intuitively, the facilitator can play, stop, pause, skip, or repeat items as appropriate. The Scenario Position Indicator points to the current item and shows the current status of the scenario. The following paragraphs describe in detail the behavior of each button and indicator.

The Scenario Position Indicator



An unfilled triangle means that the scenario is stopped. When the Play button is clicked, the item pointed to by the indicator is be played.



A rapidly blinking triangle means that the scenario is playing the item to which the indicator is pointing.



A slowly blinking triangle means that the scenario is paused at the item to which the indicator is pointing.

The Scenario Buttons



Plays the item to which the scenario position indicator is pointing. This button has to states: play or pause.



Pauses the scenario. This state of the play button is only active when the scenario is playing. It is disabled when a 'Wait indefinitely' item is playing because in such case the scenario is already paused.



The Stop button has 2 behaviors depending on when it is clicked. When clicked once, the Stop button halts the scenario at the end of the currently playing item. When clicked a second time, the scenario is stopped immediately. For example, if the currently playing item has a transition of 1:00 minute and the Stop button is pressed when it has 0:10 seconds left, the scenario will be halted at the end the transition (i.e., in 10 seconds). If the Stop button is clicked again within those remaining 10 seconds, the scenario stops immediately.



The Next button advances the indicator to the next item on the scenario regardless if the scenario is playing, paused, or stopped. It can also be used to move the indicator to select an item before playing it.



Similar to the Next button, the Previous button returns the indicator to the previous item in the scenario.



The Reset button stops the scenario immediately and returns the indicator to the first item in the scenario.

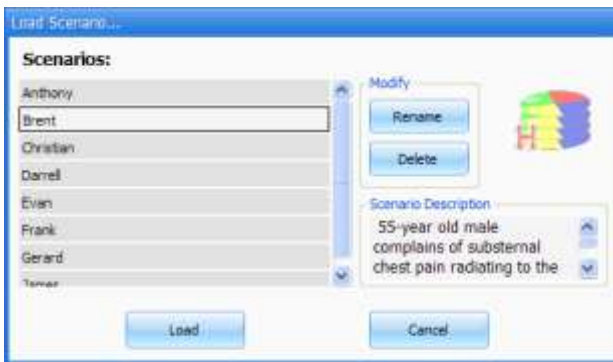
(2) Using Factory Preset Scenarios

A powerful way to teach Emergency Care is to use the factory preset scenarios. To locate and load any of them, follow these three easy steps:

1. Go to the Scenario page.



2. Click on Load Scenario. The Load Scenario dialog box appears.



3. Select the desired scenario and click on load.

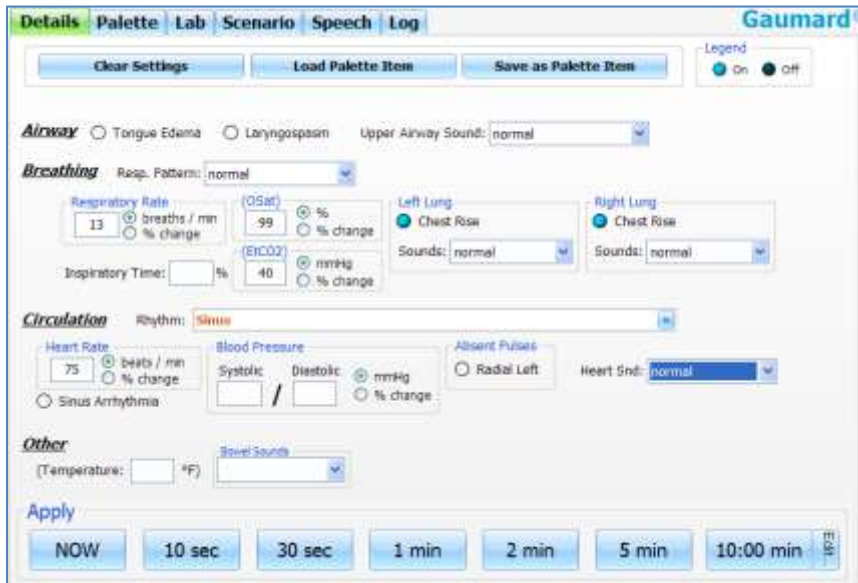


After loading the desired scenario, click on play and watch the vital signs adjust according to the specifications of each palette.

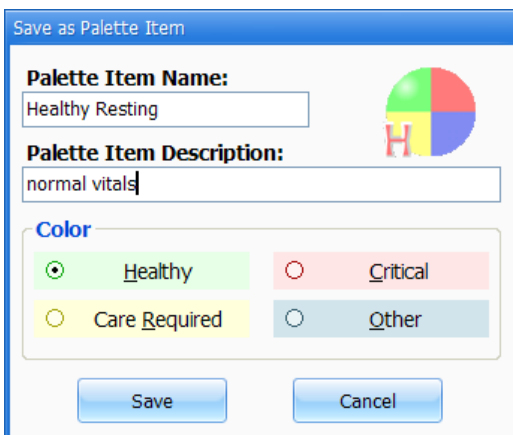
(3) Creating your own Scenarios

Follow the simple steps below to create a custom scenario

1. First, create the palette items that you will use in your scenario. To do so, go to the Details tab and change the controls that best describe the condition you are trying to simulate. Not every field has to be populated in order to save a palette item.



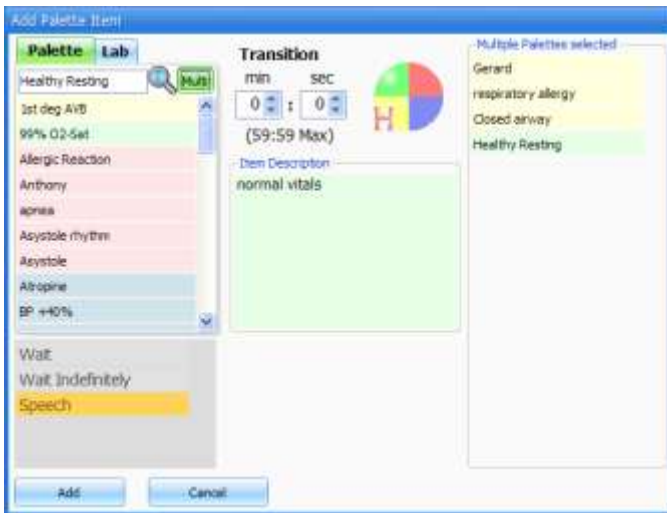
2. Save your palette(s) by clicking on the **"Save as Palette Item"** button on the upper right side of the page. The "Save as Palette Item" dialog box is now displayed. Assign a name to the Palette Item and specify a brief description. Also, select a color that represents the palette's condition: green for healthy, red for critical, yellow for care required, and blue for other. Click Save.



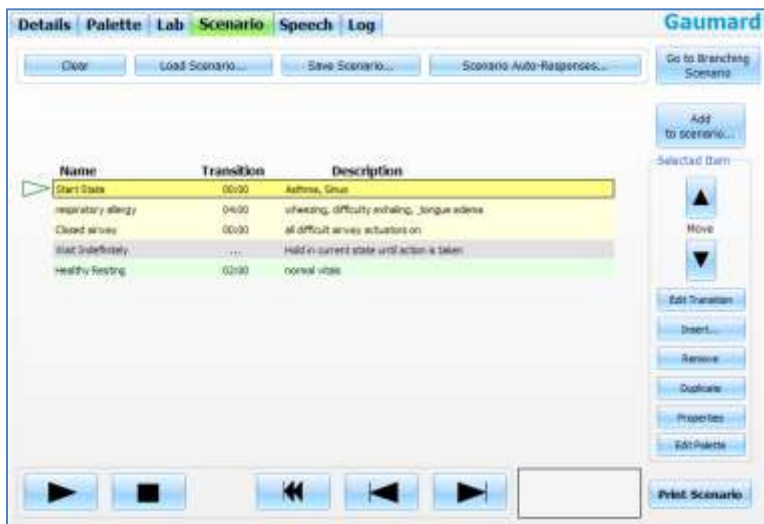
- After creating all your palettes, go to the Scenario tab.



- Click on the "Add to Scenario" button. Select a single palette or enable **Multi** to select multiple palettes at the same time. Specify a transition time for the palette and click "Add".



- Repeat step 4 to add more palettes, wait times, speech and labs.



- Select the palette and edit transition time using the **Edit Transition** button on the right panel.
- Begin the scenario by pressing play. Watch the vital signs adjust according to the specifications of each palette item.

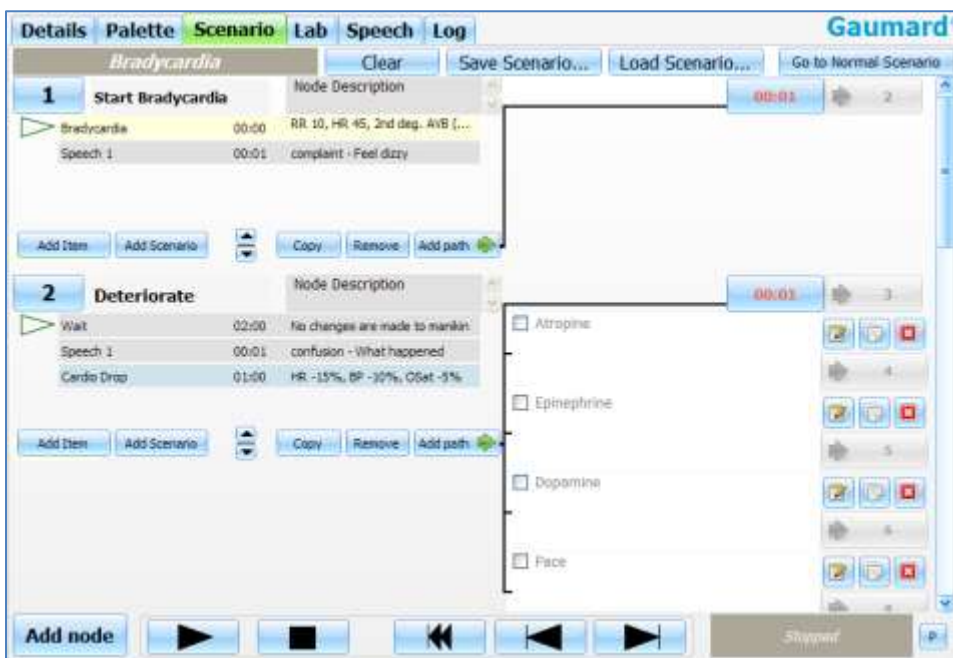
b) Branching Scenarios

To access the Branching window, click on the **Go to Branching Scenario** button on the Scenario tab. Similar to the linear scenario page, the buttons on the top panel can be used to clear, load and save a scenario, or to switch from branching to linear scenarios.



Branching Scenario screen

The branching scenario is an advanced linear scenario editor. It allows the facilitator to branch towards different scenarios/palettes in response to the provider's actions.



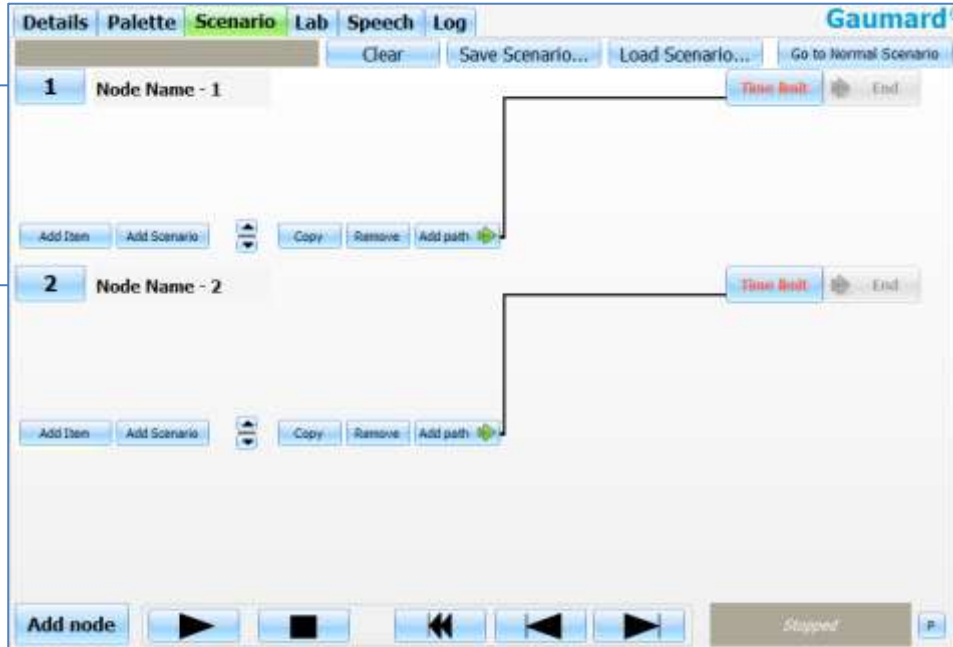
Go to the linear scenario page by clicking on the "Go to Normal Scenario" button.

Adding Nodes

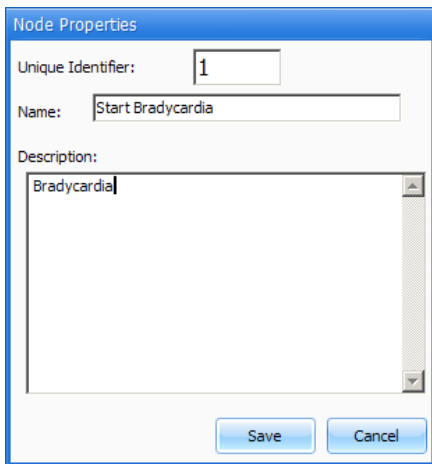
A branching scenario will consist of several "Nodes" each with preconfigured paths.

To add a node, click **Add node** near the bottom of the page.

Node identifier number



To edit the node name and description, click the node's identifier number button. Click **Save** to apply changes



In this example, the following nodes will be created: [1] Start Bradycardia, [2] Deteriorate, [3] Interventions, and [4] Atropine, [5] Epinephrine, [6] Dopamine and [8] Pace as possible responses.

Adding Palettes or Scenarios

Each node is configured with a set of palettes or scenarios.



Click **Add Item** to add specific palette items or **Add Scenario** to add full scenarios to this node.



Repeat the process and add palettes to the rest of the nodes.

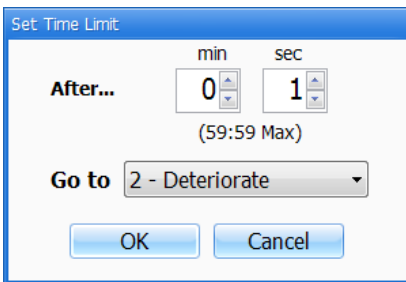
In this example, the following nodes will be created: [1] Start Bradycardia, [2] Deteriorate, [3] Interventions, [4] Atropine, [5] Epinephrine, [6] Dopamine and [8] Pace. Nodes 4,5,6,8 have been programmed with specific palettes to reflect the effects of the medication administered.

Adding Paths

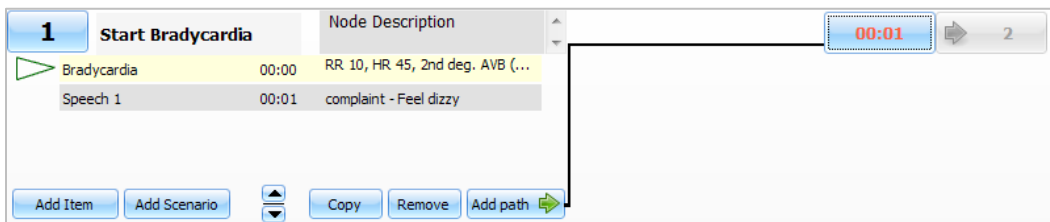
A path refers to the trajectory from one node to another after the last palette in a node expires. Click on the time limit icon to modify the “go to” point for the default path.



Configure the countdown timer and the “go to” point for the default path. Click **OK** to save.

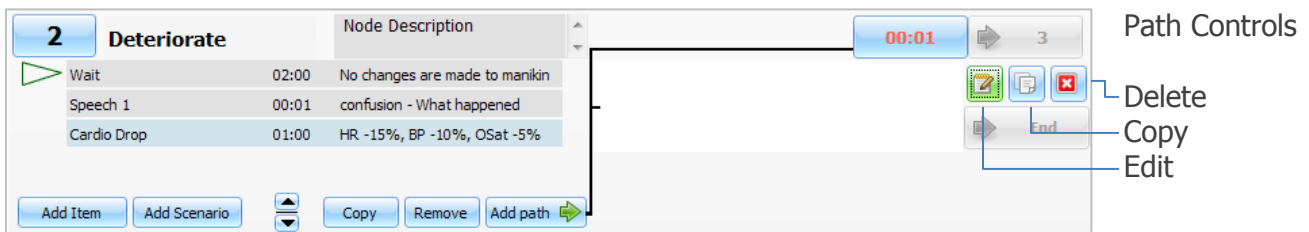


Node 1 is now configured to continue to Node 2 as indicated by the path’s “go to” point.



Key Events

Key events allow the facilitator to alter the trajectory of a branched scenario. This is done by assigning multiple paths to a single node, then selecting one of the paths when the provider completes a desired task. To **add a key** event to a node, first click the Add path button, then the edit button located on the right.



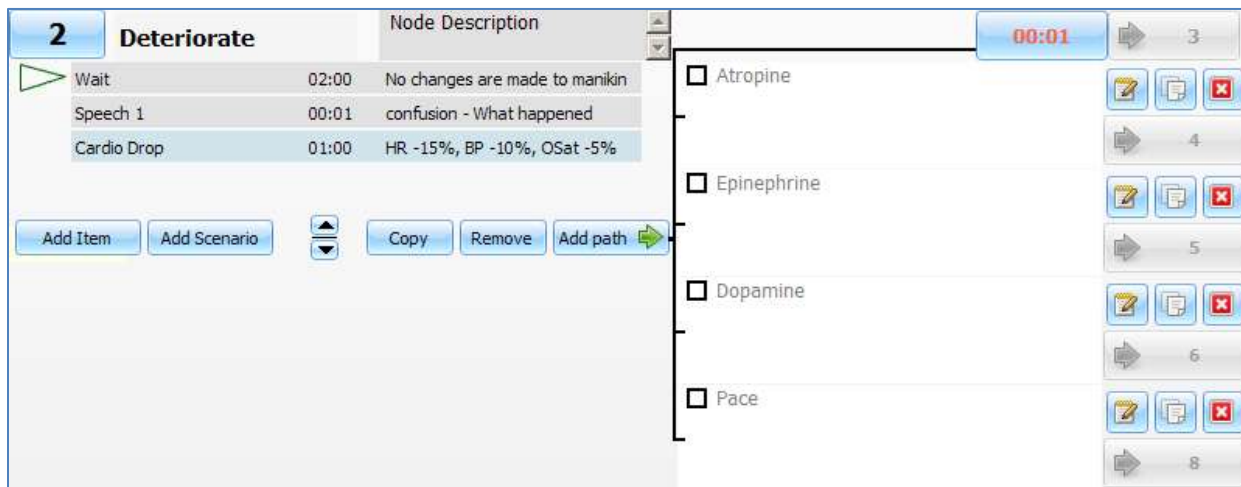
Use the **Edit Path** window to name, rename, sort and create **key events**.

Name the **key event** and then select the **Go to** node from drop-down menu. Click **OK** to save.



In this example, the provider will have the option to administer Atropine.

*The facilitator added a total of four paths to **Node 2 Deteriorate**: Atropine, Epinephrine, Dopamine and Pace. Once the provider performs an action such as the administration of Atropine or epinephrine, the facilitator clicks the key event to alter the path of the scenario.*



c) Factory Preset Scenarios

Pre-built scenarios are found under the **Quick Start HAL profile**. Seven of these scenarios are linear and three are branching.

Scenario Name	Patient Age	Scenario Type	Scenario Description
Linear Scenarios			
Anthony	77	Cardiac	He is found pulseless and apneic
Brent	55	Cardiac	Brent complains of substernal chest pain radiating to the jaw. Patient is diaphoretic, trembling, and has a waxing and waning mental status.
Christian	18	Cardiac	College freshman calls EMS after taking a caffeine preparation prior to exams. He is short of breath and says that his heart is "beating fast and funny."
Darrell	65	Cardiac	Darrell complains of dizziness and shortness of breath. He has a history of emphysema and does not know how much "breathing medicine" he has taken. During the interview, his eyes roll back and he slumps in his seat, unresponsive. (No peripheral IV sites are available.)
Evan	72	Cardiac	Evan is found tachycardic and tachypneic. He is disoriented and barely responsive. Patient's wife says that he has both heart and lung trouble and that they have been unable to afford his medicine in the past month. (After "apnea" item, facilitator should set scenario auto-response to pacing to "none" to simulate loss of capture.)
Frank	50	Trauma	Frank found at home complains of weakness and fatigue. He is conscious and alert but slightly short of breath. An empty bottle of digoxin sits on his bedside table. (He will claim not to have taken any in several days. Pharmacological rate control will only be effective briefly.)
Gerard	35	Respiratory	Gerard calls for help at local restaurant after onset of alarming respiratory symptoms. (Patient experiencing allergic reaction to food, asthma attack, or exposure to inhaled toxin.)
Branching Scenarios			
Bradycardia	n/a	Adult ALS	An in-hospital patient is diagnosed with Bradycardia and requires immediate attention. Note: for this scenario to function as intended the instructor should enable automatic pacing capture in the 'Setup -> Auto-Responses' menu.
Pulseless Arrest	n/a	Adult ALS	A young male was found unconscious.
Tachycardia with Pulse	n/a	Adult ALS	SVT with pulses. Note: this scenario can progress directly to the Pulseless Arrest scenario. To do so, load "Pulseless Arrest" after stopping this scenario while on Node 2.

Flowcharts for these scenarios can be found in [section VI.A](#) of the instruction manual.

6. Speech

a) Prerecorded Sounds

HAL has over 80 pre-recorded expressions that can be initiated with a single click on the Speech page. The collection of speech and other sounds was chosen to cover a wide range of simulated emergencies.

The screenshot shows the Gaumard® HAL S1000 Speech interface. It features a top navigation bar with tabs for 'Details', 'Palette', 'Scenario', 'Lab', 'Speech' (highlighted), and 'Log'. The main content area is organized into several columns and sections:

- Complaint:** A grid of 27 buttons for various symptoms like 'Ankle broken', 'Feel nauseous', 'Leg is broken', etc.
- Confusion:** A vertical list of 4 buttons: 'Are you a doctor', 'I don't remember', 'What happened', 'Who are you'.
- Description:** A vertical list of 7 buttons: 'A little bit', 'A lot', 'I can't move it', 'It's dull', 'It's sharp', 'Not pain... pressure', 'Pain in center chest', 'Sharp tearing pain'.
- Reply:** Two buttons: 'Yes', 'No'.
- Occurrence:** A vertical list of 7 buttons: 'Once', 'Twice', 'Three times', 'Four times', 'Since last night', 'Since this afternoon', 'Since this morning'.
- Num:** A vertical list of 10 buttons numbered 1 to 10.
- Location:** A vertical list of 6 buttons: 'In my arm', 'In my chest', 'In my leg', 'In my shoulder', 'Left side', 'Right side'.
- History:** A vertical list of 4 buttons: 'Asthma', 'Diabetes', 'Emphysema', 'Had heart attack', 'High blood pressure'.
- Urgency:** A grid of 3 buttons: 'Don't touch me', 'I'm gonna puke', 'Don't touch that', 'OUCH!!!', 'I don't like needles', 'That hurts!'.
- Effect:** A vertical list of 4 buttons: 'cough', 'COUGH!', 'gag', 'GAG!'.

At the bottom right, there are radio buttons for 'En' (selected) and 'Sp', and a 'More...' button.

One benefit of prerecorded sounds are that they are consistent, so that providers' interpretation of HAL's speech is not colored by the variable quality of an actor's performance. Further, the facilitator need not spend time and resources casting and directing an actor.

For ease of use, HAL's expressions are divided into natural categories and laid out on a single page, all visible at once. The following list shows the exact phrase spoken by HAL after each button is clicked.

Complaints

Ankle broken: "I think my ankle is broken!"
Arm broken: "I think my arm is broken!"
Blood in toilet: "There's blood in the toilet."
Can't catch breath: "I can't catch my breath."
Can't move legs: "I can't move my legs."
Chest hurts: "My chest hurts."
Coughing up blood: "I'm coughing up blood!"
Elephant on chest: "It's like there's an elephant standing on my chest."
Feel dizzy: "I feel dizzy."
Feel nauseous: "I feel really nauseous."
Feel weak: "I feel weak."
Heart beating fast: "My heart is beating really fast."
Heart pounding: "My heart is pounding."
Heart trying to jump: "My heart is trying to jump out of my chest."
Hurt all over: "I hurt all over."
Hurts when breathing: "It hurts when I breathe."
I've been cut: "I've been cut."
Jaw hurts: "My jaw hurts."
Left arm hurts: "My left arm hurts."
Leg is broken: "I think my leg is broken."
Passing blood: "I'm passing blood."
Peeing blood: "I'm peeing blood!"
Pooping blood: "I'm pooping blood!"
Puking blood: "I'm puking blood!"
Short of breath: "I'm short of breath."
Shoulder hurts: "My shoulder hurts."
Somebody shot me: "Somebody shot me!"
Stomach hurts: "My stomach hurts."
Worst headache: "This is the worst headache I've ever had."

Confusion

Are you a doctor?: "Are you a doctor?"
I don't remember: "I don't remember."
What happened: "What happened?"
Who are you: "Who are you?"

Location

In my arm: "in my arm"
In my chest: "in my chest"
In my leg: "in my leg"
In my shoulder: "in my shoulder"
Left side: "the left side"
Right side: "the right side"

Description

A little bit: "a little bit"

A lot: "a lot"

I can't move it: "I can't move it."

It's dull: "It's dull."

It's sharp: "It's sharp."

Not pain... pressure: "It's not pain, it's pressure."

Pain in center chest: "The pain is in the center of my chest."

Sharp tearing pain: "It's a sharp, tearing pain."

Evasion

I feel fine: "I feel fine."

Take me to hospital: "Can't you just take me to the hospital?"

Reply

Yes: "yes"

No: "no"

History

Asthma: "asthma"

Diabetes: "diabetes"

Emphysema: "emphysema"

Had heart attack: "I had a heart attack last year."

High blood pressure: "high blood pressure"

Urgency

Don't touch me: "Don't touch me."

Don't touch that: "Don't touch that!"

I don't like needles: "I don't like needles."

I'm gonna puke: "I'm gonna puke!"

OUCH!!!: "OUCH!"

That hurts!: "That hurts!"

Occurrence

Once: "once"

Twice: "twice"

Three times: "three times"

Four times: "four times"

Since last night: "since last night"

Since this afternoon: "since this afternoon"

Since this morning: "since this morning"

Numbers

- 10: "ten"
- 9: "nine"
- 8: "eight"
- 7: "seven"
- 6: "six"
- 5: "five"
- 4: "four"
- 3: "three"
- 2: "two"
- 1: "one"

Effect

cough: [quick cough]

COUGH: [extended cough]

gag: [quick gag]

GAG: [extended gag]

b) Streaming Audio

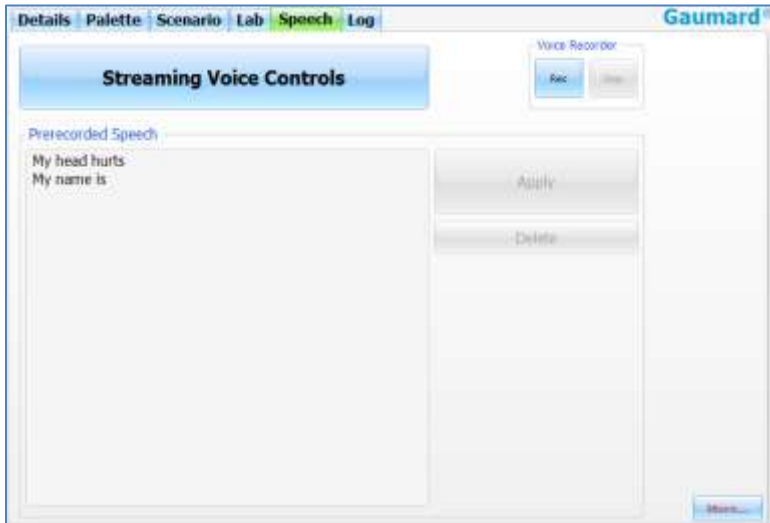
The GUI environment must be set to multiple with the simulator's serial number specified. To do so, go to Setup, Options and click on the Environment tab.

Streaming audio makes simulation even more realistic. It allows the facilitator to hear everything the providers are discussing around the simulator. At the same time, the facilitator can interact as the patients voice for the provider t. The instructor will also be able to record his own speech phrases that can be used at any given time or within a scenario.

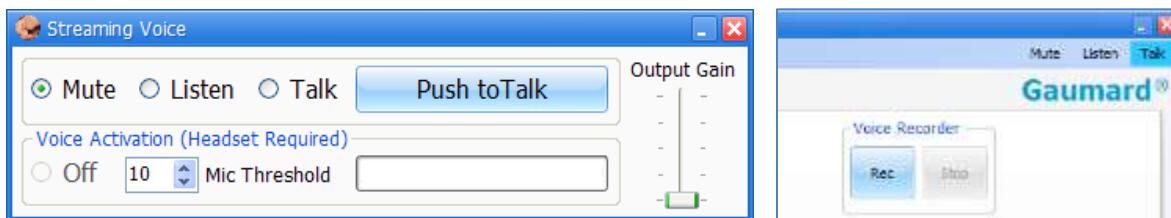


The streaming audio controls can be accessed by clicking on the "More" button in the lower right corner of the "Speech" tab.

Streaming Voice Control window



Streaming Voice Controls: This button opens a new dialog box that is available to the user at all times. Selections on that dialog box include “Mute,” “Listen,” and “Talk”. Select “Mute” to stop the communication; “Listen” to hear what providers are saying, or “Talk” to speak to the providers as the manikin’s voice. Mute, Listen and Talk controls are always available on the top right corner of the user interface.



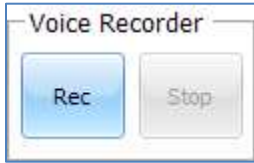
It is recommended that the instructor uses a headset to improve sound quality. The headset also allows the user to use the “Voice Activation” so that at any time the instructor wishes to speak, it is sent directly to the manikin without user intervention.

The voice activation threshold can be adjusted. The “Mic Threshold” is used to adjust how sensitive the microphone is to the user’s voice. The higher the threshold, the less sensitive the microphone is; and vice versa. For instance, if the threshold is set to high, users must speak loudly for the microphone to detect the audio.

Voice Clarity

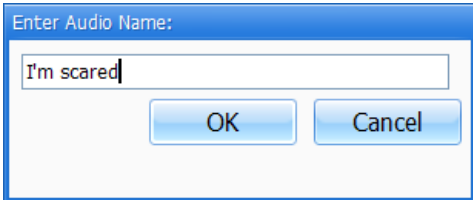
To achieve better clarity:

- Verify that the physical MIC control on your headset is set to high.
- Enable “Microphone boost” from the Windows setting in [section VI.C.2](#)
- Use the “Output Gain” to increase the microphone volume as a last resource. To raise the output gain in increments, tap and hold the control, then slide to the desired level.



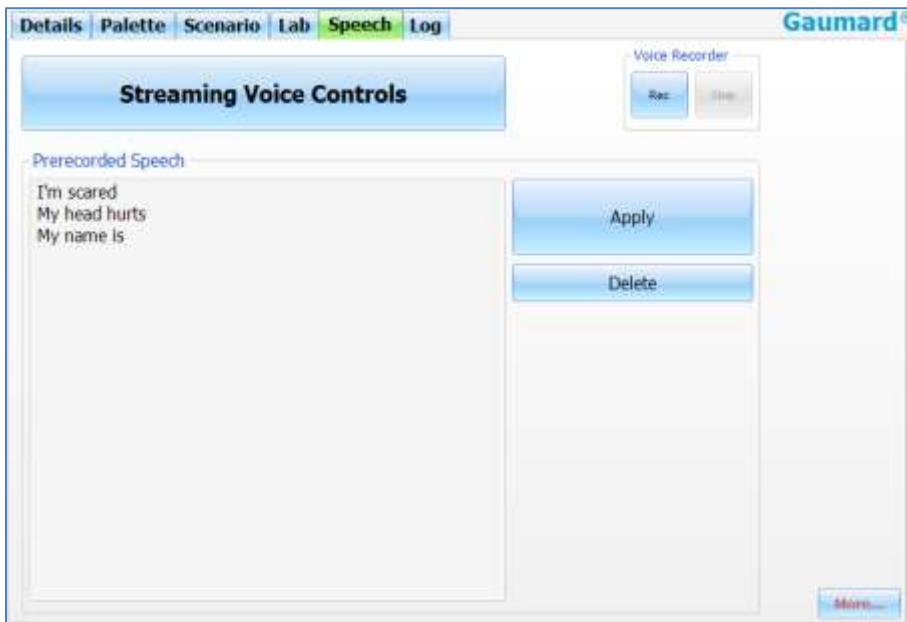
Voice Recorder: The instructor is able to record his/her own speech phrases at any time. Once the instructor clicks on the "Rec" button the software automatically starts capturing everything that is said into the microphone.

Press "Stop" to finish recording. Use the Enter Audio Name window to name the speech phrase.



Enter a name and click "OK." The phrase will now be accessible under the "Prerecorded Speech" menu.

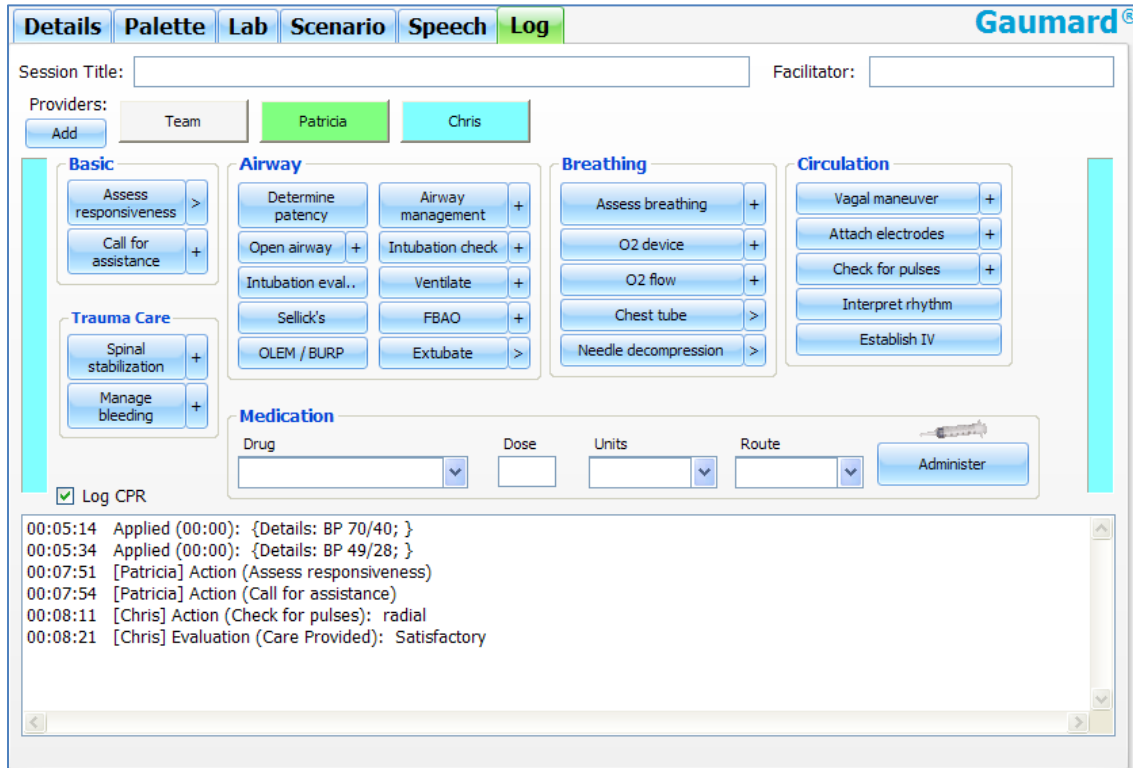
Prerecorded Speech: On this section the instructor is able to play any of the custom phrases by either typing on the text box or clicking on the menu option. Once a phrase is selected, it can be played as the manikin's voice or deleted.



More...: If the instructor wishes to play any of the Simulator's prerecorded speech phrases, he will need to click on the "More..." button located on the bottom right corner of the Speech page.

7. Log

The Log page allows the facilitator to keep track of every event during a session. It automatically creates an entry whenever a detected event occurs as well as every time there is a change on the patient condition. Also, the facilitator can log observed provider actions with a simple click.



The Log page consists of four different areas (from bottom to top): the text log, provider action buttons, team logging buttons, and session info.

a) Text Log

This is the large panel at the bottom of the Log Page, containing all the time-stamped text entries. Every event in a session is recorded as an entry in the Text Log. The different types of entries are: Actions, Applied Changes, Detected Events, Evaluations, Speech, and Notes.

Actions

Actions refers to those performed by one of the providers in the session. The facilitator can quickly log actions from the Provider Actions section and make the entry more specific using the Team Logging feature. The following is an example of an Action entry:

"00:07:24 Action (Assess responsiveness)"

Applied Changes

An 'Applied' log entry occurs automatically every time there is a change to the physiological condition of the manikin. In other words, every time changes are made from the Details page, Palette page, or from a Scenario a log entry like the following is created:

"00:04:01 Applied (00:30): Details: Rhythm Sinus; Cardiac event 0; HR 80;"

Detected Events

Every time one of the various sensors in the manikin detects a provider action, it is automatically logged as a 'Detected' entry. These actions include intubation, BP cuff placement, artificial ventilations, chest compressions, and electrical therapy (pacing, defibrillation, cardioversion, inappropriate shock). The following example shows an entry after a provider attempts to defibrillate:

"00:03:26 Detected (defibrillation): Shock # 2 - 300 Joules."

Evaluations

Evaluations are added by the facilitator by clicking on the 'Satisfactory' or 'Unsatisfactory' buttons on the Evaluation panel. Team Logging allows the facilitator to evaluate individual providers with a single click. For example, if provider Patricia did a correct procedure, the Evaluation entry would be:

"00:07:43 [Patricia] Evaluation (Care Provided): SATISFACTORY"

Speech

When the facilitator makes HAL® speak from the Speech page, an entry in the text log is automatically generated:

"00:18:10 Speech (Urgency): "Don't touch me"

Notes

Notes can be entered directly from the Evaluation panel or by right-clicking on the text log and adding a note. The following is an example of a Note entry:

"00:10:10 Note: provider took too long to assess patient."

b) Provider Actions

The Provider Actions section refers to the collection of buttons in the middle of the page. It allows the facilitator to accurately keep track of provider actions. The buttons are grouped into 6 groups: Basic, Trauma Care, Airway, Breathing, Circulation, and Medication. Anytime the facilitator clicks one of the buttons, a time-stamped log entry is generated with that particular action. For example, if the 'Assess responsiveness' button is clicked when the session clock reads 00:07:24, the following entry is automatically generated:

"00:07:24 Action (Assess Responsiveness)"

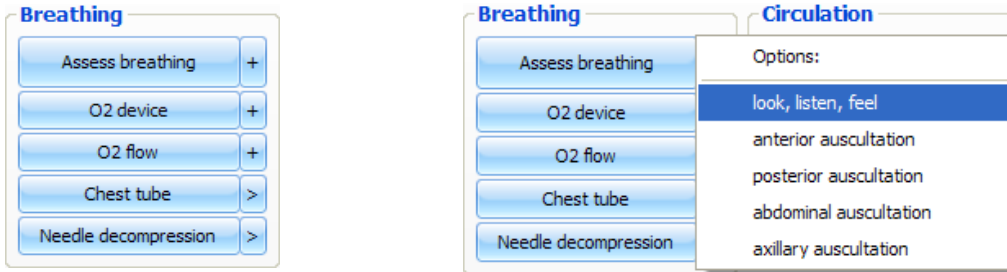
Special Buttons

Some provider-action buttons are accompanied by a special option button.

The first special button, " + ", lets the facilitator be a log actions in more detail. For example, if the button "Assess breathing" is clicked, the following entry is created:

"00:01:28 Action (Assess breathing)"

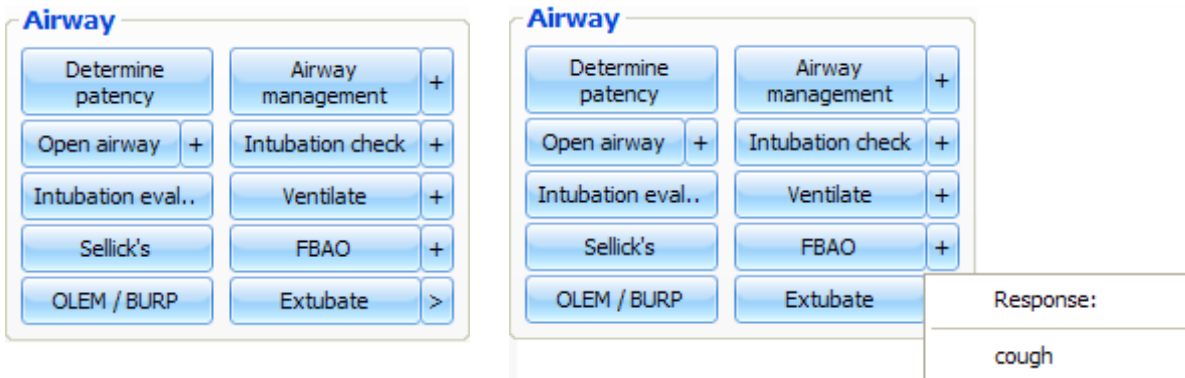
On the other hand, if the " + " button next to "Assess breathing" is clicked, a list of additional options appears. The facilitator can be more specific and choose, for example, "look, listen, feel":



...and the following entry is added:

"00:01:28 Action (Ventilate): look, listen, feel"

The second special button, " > ", allows pre-programming common responses to specific actions. For example, the facilitator can pre-program normal respiratory sounds and re-enable the lungs when the provider performs a needle decompression.

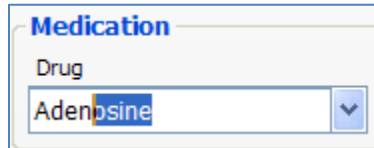


When the "extubate" button is clicked the following entry is created:

"00:01:28 Action (Extubate): cough"

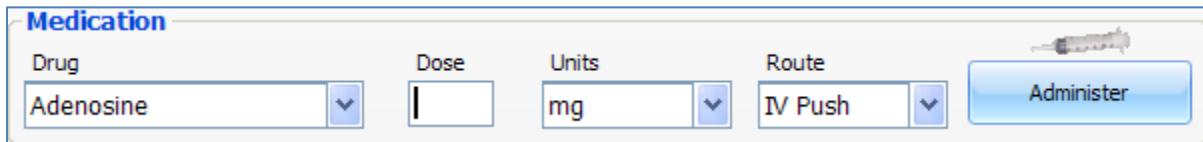
Medications

The Medications section allows for easy and fast logging of drugs administration, including dose and route. The software comes preloaded with a set of commonly used drugs. Each of these drugs has a default dose unit and a default route for administration (which can be overwritten by just typing over). For example, for Adenosine the default dose unit is "mg" and the default route is "IVP" (intravenous push). In order to enter, for example, that a provider administered 6 mg of adenosine via IVP, the facilitator just has to enter the text "ad" and the software automatically searches the drug list and displays the best match (if any).



A screenshot of a software window titled "Medication". It features a "Drug" label above a dropdown menu. The dropdown menu is open, showing "Adenosine" as the selected option. A small downward arrow is visible on the right side of the dropdown.

After a drug has been selected, just clicking on the 'dose' text field automatically fills the units and route fields with the default values for that particular drug.



A screenshot of the "Medication" form. It contains four input fields: "Drug" (dropdown menu with "Adenosine" selected), "Dose" (empty text field), "Units" (dropdown menu with "mg" selected), and "Route" (dropdown menu with "IV Push" selected). To the right of these fields is a blue button labeled "Administer" with a syringe icon above it.

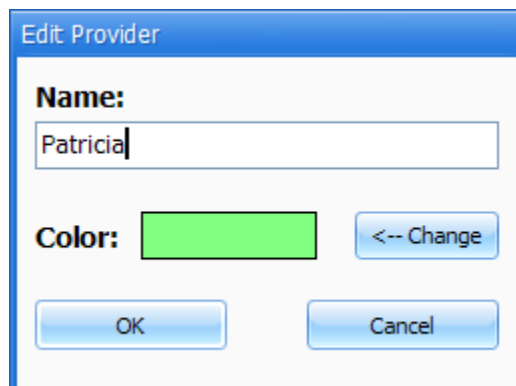
The facilitator then enters the dose and clicks on the "Administered" button and a log entry is created (let's say the dose entered was "6"):

"00:05:43 Action (Medication Administered): Adenosine, 6 mg, IVP"

c) Team Logging

The Team Logging feature allows the facilitator to designate which member of the team performed a particular action. The Team Logging section is right above the Provider Actions section on the Log page.

First, the facilitator should add all providers in the team, one by one, by clicking on the *Add* button and filling the "Add Provider" dialog box.



A screenshot of a dialog box titled "Edit Provider". It has a "Name:" label followed by a text input field containing "Patricia". Below that is a "Color:" label followed by a green color swatch and a "<-- Change" button. At the bottom are "OK" and "Cancel" buttons.

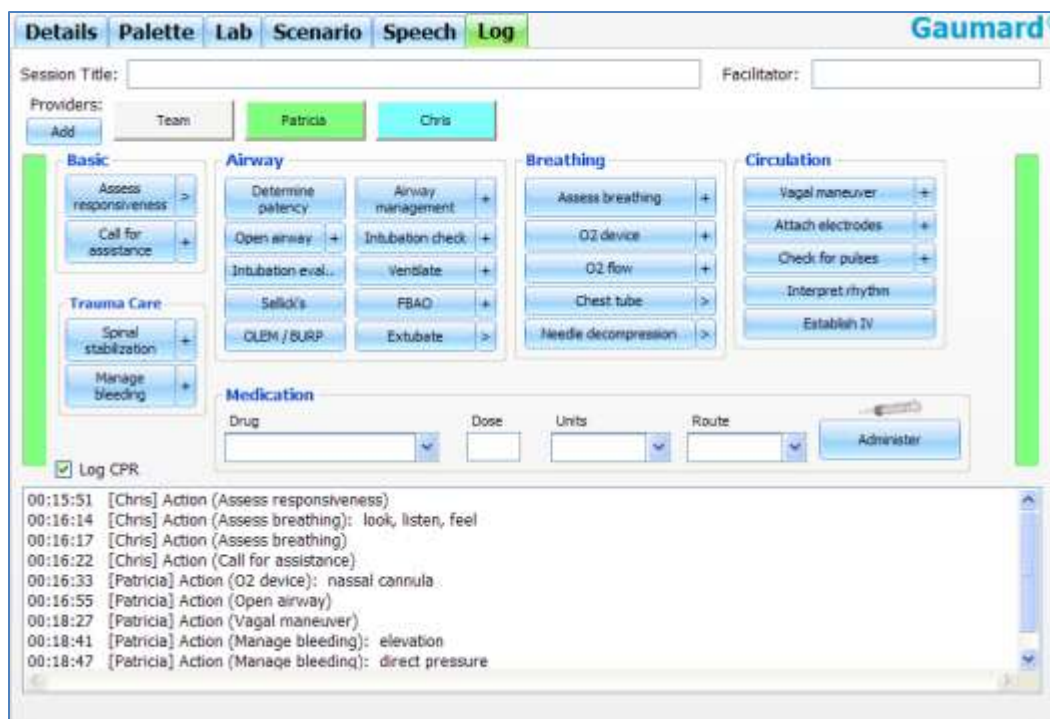
As shown in the Log Page image (at the beginning of this section), a colored button is inserted on the Team Logging region for the provider just added. There can be up to six different providers, each with a corresponding button. Every time one of the provider buttons is clicked, that person becomes the active provider. To indicate the active provider, the vertical bars on each side of the Log page will match the color chosen for that person. On the Log Page image, for example, the provider "Patricia" is the active provider, so the vertical bars are green colored. While there is an active provider, every time a Provider Action or Evaluation log entry is created it will have the name of the provider prepended to it as follows:

"00:07:41 [Patricia] Action (Check for pulses): radial"

To deactivate/deselect the active provider and return to general logging, click the "Team" button and the vertical bars will return to neutral color. All provider buttons can be edited or deleted by right-clicking them and selecting an option from the menu.

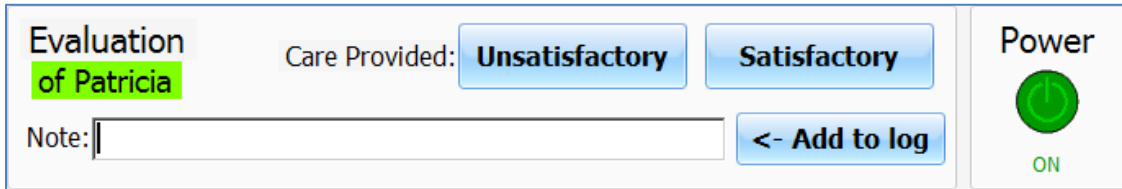
d) Session Information

The session info area contains the "Session Title" and "Facilitator" fields at the top of the page. These fields are included when a report is saved or printed.

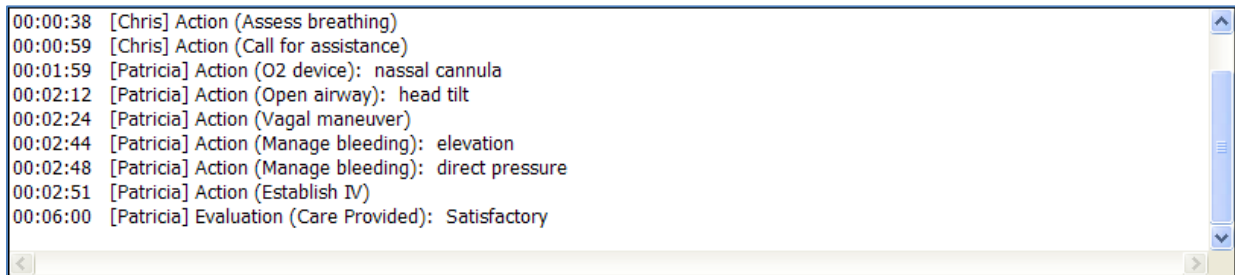


8. Evaluation

The Evaluation panel, always visible at the bottom of the HALUI window, allows the facilitator to insert standard evaluations or arbitrary notes into the log. The stylus device and hand-writing recognition technology makes annotating in real-time very fast and convenient.



Standard evaluations are given context by their position in the log relative to detected and observed provider actions. The following example illustrates this idea.

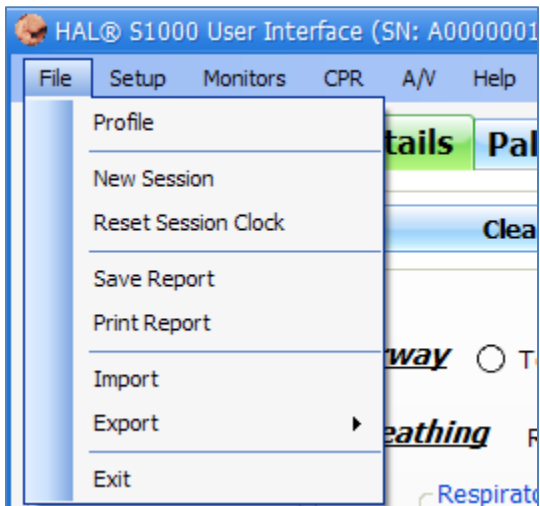


Note above that the provider "Patricia" checked the patient's radial pulse and was then evaluated on that action.

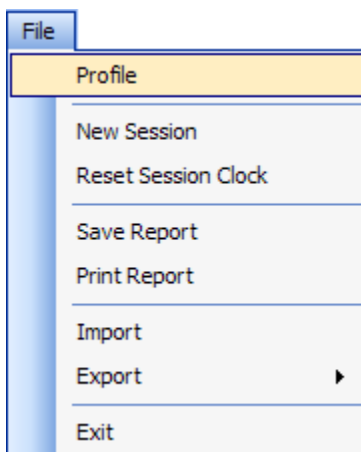
The evaluation panel is part of the team-logging system, described previously. When a particular provider is selected, log entries generated via the Evaluation panel will be prepended with the provider's name. For more information on Team Logging, see the previous section of this guide on Logging.

C. Menus

1. File



a) Profile

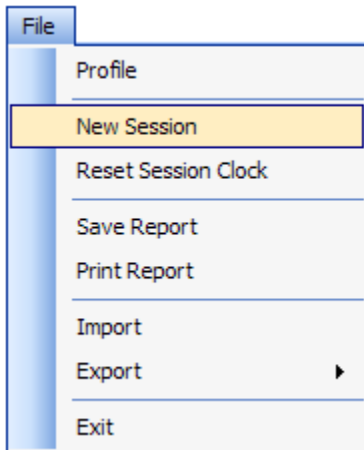


This option allows you to change your current profile.
The profile dialog box is displayed:



The profiles dialog box displays the available profiles. A software restart is not necessary to switch between profiles.

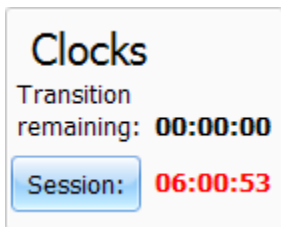
b) New Session



Clicking New Session in the file menu will:

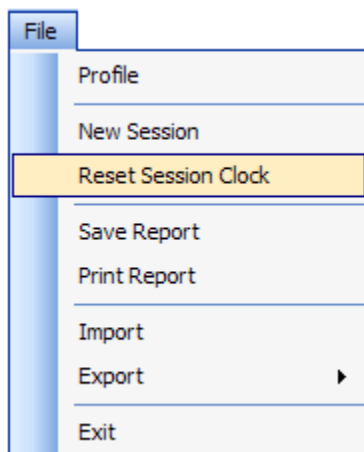
- Clear any loaded/playing scenario
- Clear any loaded/playing palette
- Reset vital signs to normal values
- Clear out log page
- Restart the session clock.

The session clock is located at the bottom of the dialog box.

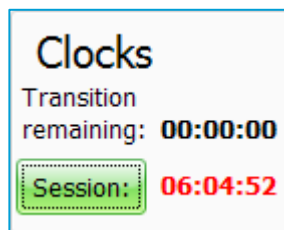


The shortcut key for starting a new session is: **Ctrl + N**

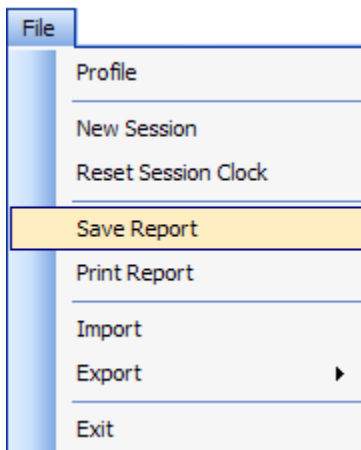
c) Reset Session Clock



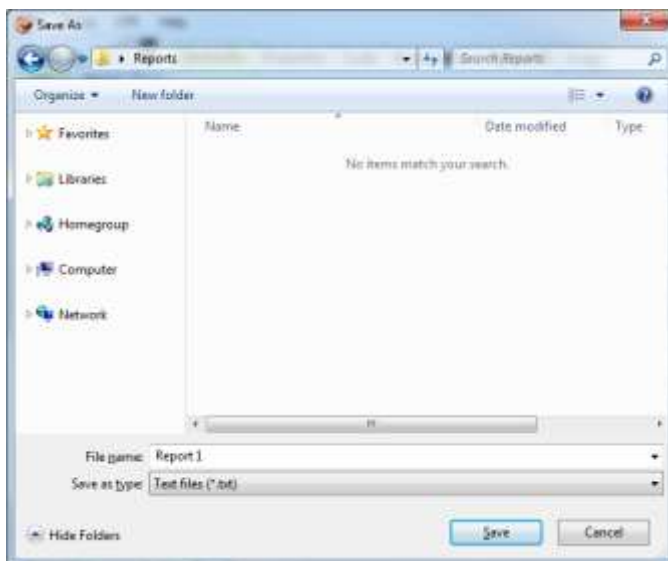
Clicking on Reset Session Clock resets the clock back to zero. It does not have any effect on the transition time remaining on a scenario; it does not reset the vital signs, or clear out loaded scenarios. The facilitator can also reset the session clock by clicking on the Session button next to the session time.



d) Save Report



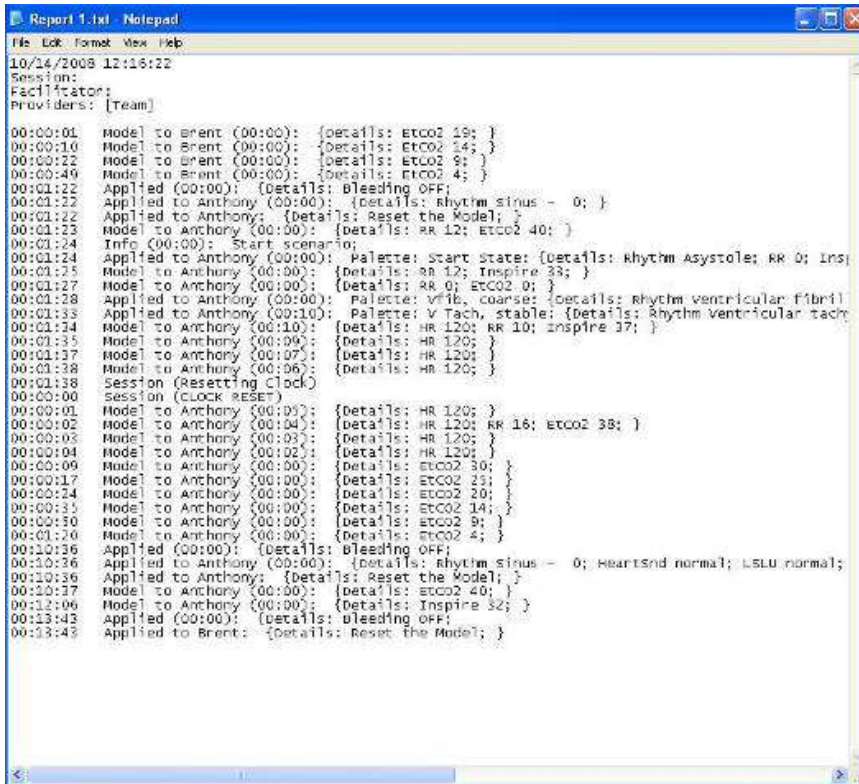
This option allows you to save all the information recorded in the log page as a text file. Clicking on it brings up the "Save As" dialog box:



Select the desired name and path, and click "Save".

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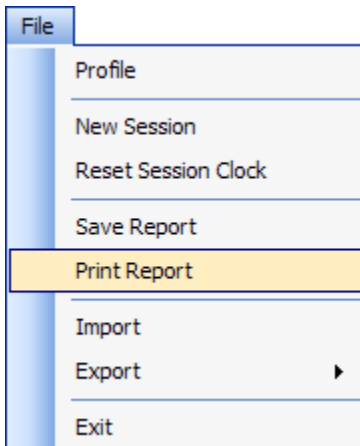
The shortcut key for saving a report is Ctrl + S. For a sample report, look at the figure below:



```
Report 1.txt Notepad
File Edit Format View Help
10/14/2008 12:16:22
Session:
Facilitator:
Providers: [Team]

00:00:01 Model to Brent (00:00): {details: EtCO2 19; }
00:00:10 Model to Brent (00:00): {details: EtCO2 14; }
00:00:22 Model to Brent (00:00): {details: EtCO2 9; }
00:00:49 Model to Brent (00:00): {details: EtCO2 4; }
00:01:22 Applied (00:00): {details: Bleeding OFF; }
00:01:22 Applied to Anthony (00:00): {details: Rhythm sinus - 0; }
00:01:22 Applied to Anthony: {details: Reset the Model; }
00:01:23 Model to Anthony (00:00): {details: RR 12; EtCO2 40; }
00:01:24 Info (00:00): Start scenario;
00:01:24 Applied to Anthony (00:00): Palette: Start State: {details: Rhythm Asystole; RR 0; Insp
00:01:25 Model to Anthony (00:00): {details: RR 12; Inspire 33; }
00:01:27 Model to Anthony (00:00): {details: RR 0; EtCO2 0; }
00:01:28 Applied to Anthony (00:00): Palette: Vfib, coarse: {details: rhythm ventricular fibril
00:01:33 Applied to Anthony (00:10): Palette: V Tach, stable: {details: Rhythm ventricular tach
00:01:34 Model to Anthony (00:10): {details: HR 120; RR 10; inspire 17; }
00:01:35 Model to Anthony (00:09): {details: HR 120; }
00:01:37 Model to Anthony (00:07): {details: HR 120; }
00:01:38 Model to Anthony (00:06): {details: HR 120; }
00:01:38 Session (Resetting Clock)
00:00:00 Session (CLOCK RESET)
00:00:01 Model to Anthony (00:00): {details: HR 120; }
00:00:02 Model to Anthony (00:04): {details: HR 120; RR 16; etco2 38; }
00:00:03 Model to Anthony (00:03): {details: HR 120; }
00:00:04 Model to Anthony (00:02): {details: HR 120; }
00:00:09 Model to Anthony (00:00): {details: EtCO2 30; }
00:00:17 Model to Anthony (00:00): {details: EtCO2 23; }
00:00:24 Model to Anthony (00:00): {details: EtCO2 20; }
00:00:33 Model to Anthony (00:00): {details: EtCO2 14; }
00:00:50 Model to Anthony (00:00): {details: EtCO2 9; }
00:01:10 Model to Anthony (00:00): {details: EtCO2 4; }
00:10:36 Applied (00:00): {details: Bleeding OFF; }
00:10:36 Applied to Anthony (00:00): {details: Rhythm sinus - 0; HeartSnd normal; WSLU normal; }
00:10:36 Applied to Anthony: {details: Reset the Model; }
00:10:37 Model to Anthony (00:00): {details: EtCO2 40; }
00:12:06 Model to Anthony (00:00): {details: Inspire 32; }
00:13:43 Applied (00:00): {details: Bleeding OFF; }
00:13:43 Applied to Brent: {details: Reset the Model; }
```

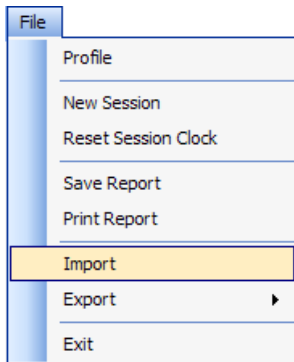
e) Print Report



This option allows you to print a text file containing all the information in the log for the latest session. Clicking on "Print Report" brings up the Print dialog box.

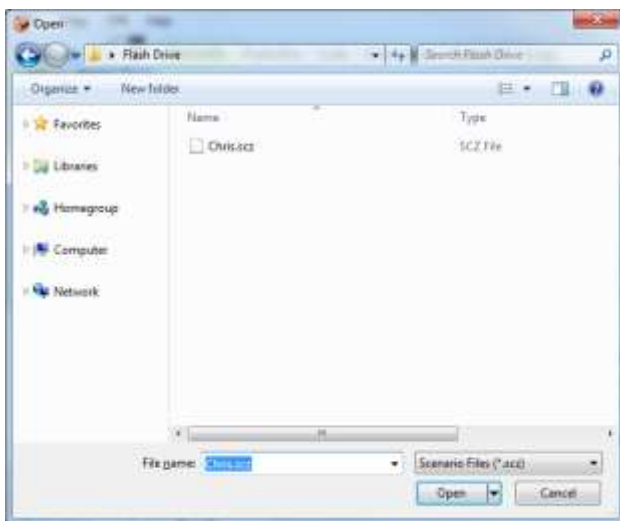
The shortcut key for this option is **Ctrl + P**.

f) Import



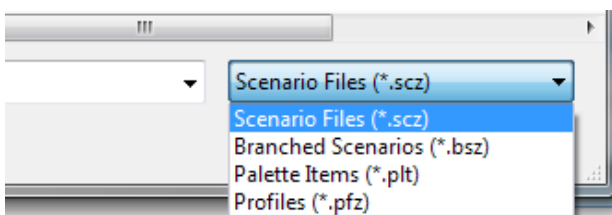
This tool allows the import of palettes, scenarios or modeling patients that may have been created on another tablet PC.

When Import is clicked, the "Open" dialog box is displayed:

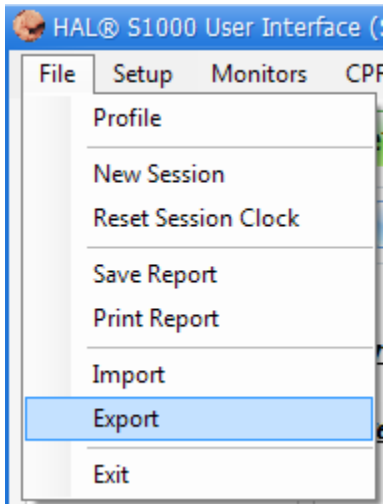


Browse to the location where the palette, scenario, or patient files have been saved and open it. They are automatically brought into the GaumardUI.

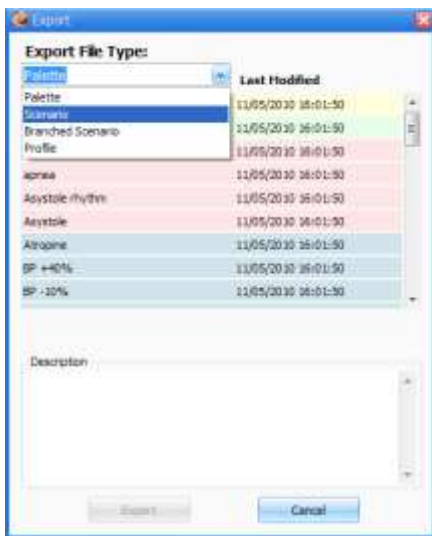
Make sure the correct file type is selected:



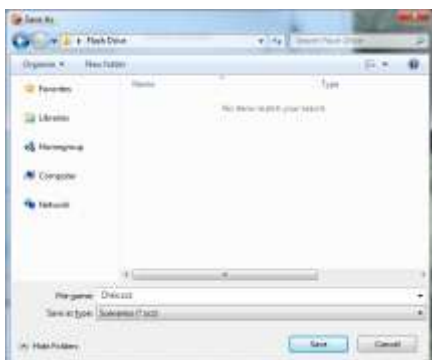
g) Export



You can export palettes and scenarios (branched or linear).

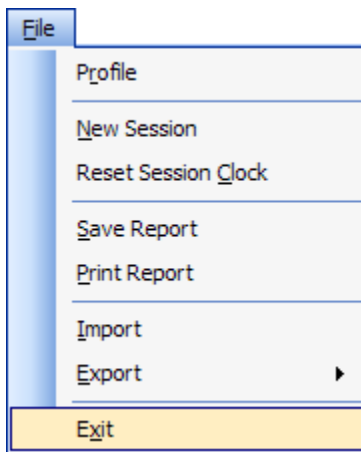


To transfer palettes or scenarios to the Gaumard Laptop, export the files to a flash drive. Then follow the import steps to copy the new files to your Gaumard Tablet.



Use this feature to back up custom scenarios and palette items.

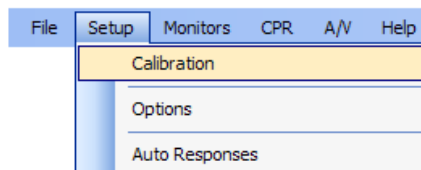
h) Exit



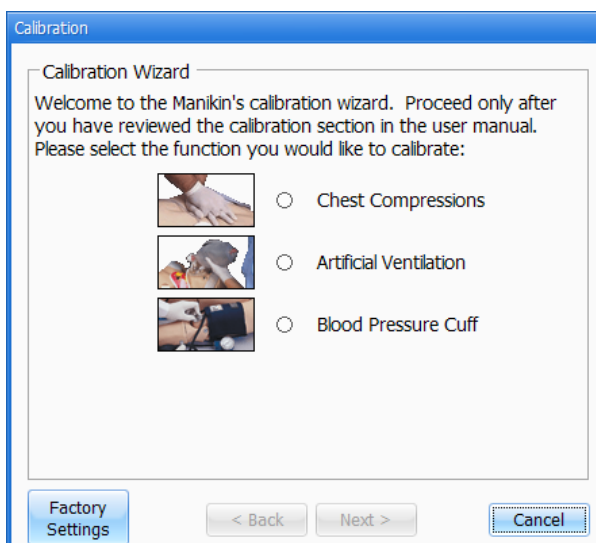
You can exit the software at any time by going to File, Exit or by clicking on the "x" button at the top right corner of the user interface.

2. Set-up

a) Calibration



This tool allows you to easily calibrate the sensors inside the manikin. First choose which function you would like to calibrate: chest compressions, artificial ventilations, or blood pressure cuff.



The procedures for each specific calibration are described in the sections below.

(1) Chest Compressions/Artificial Ventilations

This tool helps you calibrate the chest compressions and the artificial ventilations to your specific criteria. That is, you will be telling the system what a correct chest compression is and/or what a correct artificial ventilation is. Providers will be evaluated by the system based on this criteria.

The chest compressions and ventilations are calibrated the same way. After making a selection, this dialog box is displayed:



Click next to proceed with the calibration.

The software will now ask you to perform a number of "correct" chest compressions or artificial ventilations, depending on what you are calibrating. Follow the text cue on the screen to perform just ONE compression or ventilation at a time, until prompted for the next one.

For example, if calibrating chest compressions:

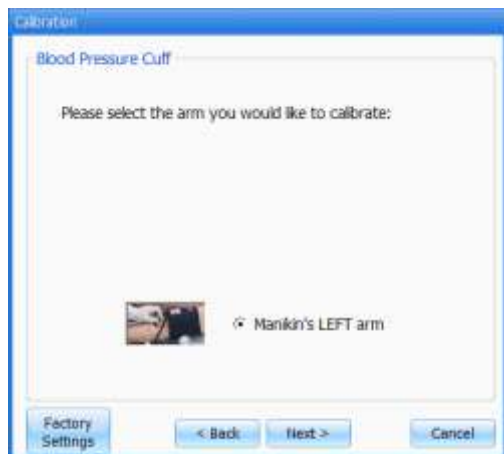


- ▶ The wizard prompts you with a "#1".
- ▶ Perform one correct chest compression.
- ▶ A green filled oval indicates that the chest compression was successfully recorded.
- ▶ The wizard prompts you with a "#2".
- ▶ Perform a second correct chest compression.
- ▶ A green filled oval indicates that the chest compression was successfully recorded.
- ▶ ...and so on.

At the end of the calibrating session, the wizard shows the average peak, depth, and duration values for the procedure. If you feel you performed the procedures correctly, click the "Save" button. Otherwise, press the "Back" button to repeat the calibration.

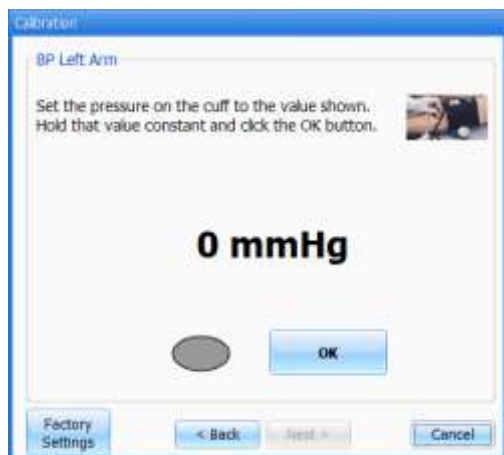
(2) Blood Pressure Cuff

Blood pressure cuff calibration should be performed only when the Korotkoff sounds do not match the systolic and diastolic values set from the computer. To calibrate, place the blood pressure cuff on the left arm.



Click next to begin calibration.

You will then be prompted to set the BP cuff to a certain pressure, hold that pressure constant, and press the "OK" button. Follow the text cue on the screen and repeat the procedure for each pressure level until "Done" is displayed.



For example, calibrating the left arm:

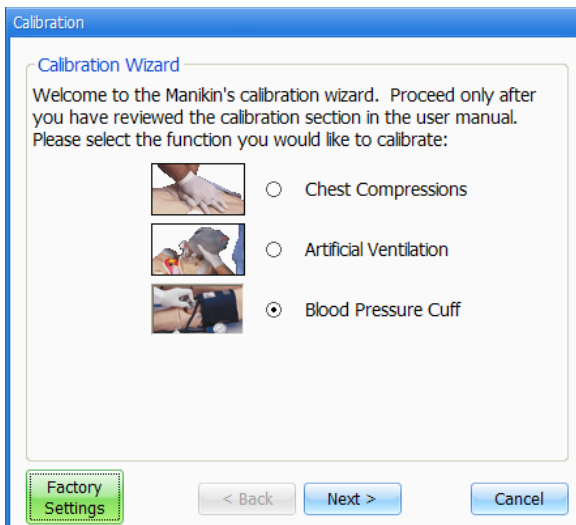


- ▶ The wizard prompts you with "0 mmHg."
- ▶ Set the pressure on the BP cuff to 0 (i.e. cuff valve open).
- ▶ Click the "OK" button.
- ▶ A green filled oval indicates that the value was successfully set.
- ▶ The wizard then prompts you with "20 mmHg".
- ▶ Set the pressure on the BP cuff to 20 mmHg.
- ▶ Click the "OK" button.
- ▶ A green filled oval indicates the value was successfully set.
- ▶ ...and so on.

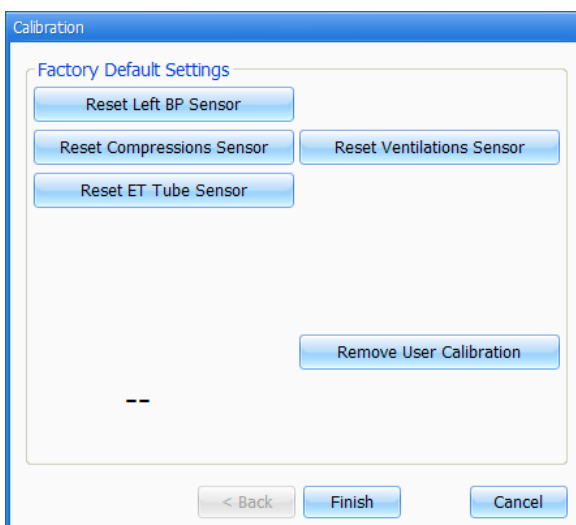
Once the prompt reads "Done", go back and calibrate another function or click the "Finish" button to close the calibration wizard.

(3) Factory Settings

Factory Settings is a very useful tool to consider when recalibrating. It restores the sensors to factory settings over-riding any calibrations performed by users.



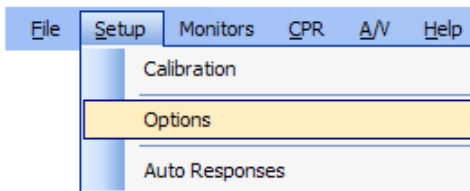
Make sure that when you are restoring the sensors to the factory settings that no one is practicing chest compressions, ventilations or reading a blood pressure. Any of these actions may interfere with the reset. Each time that one of these sensors is clicked a message will appear at the bottom left of the screen notifying the user of the status of the reset (OK, or TRY AGAIN). Should the Sensor not respond, please refer to the troubleshooting guide or contact Technical Support.



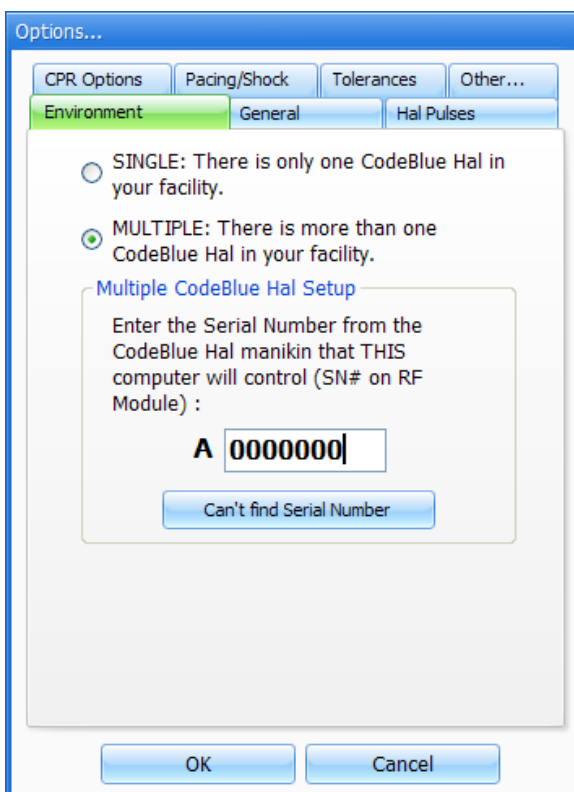
At the end of calibrating a function, the Calibration Wizard resets the manikin for the changes to take effect and displays the message "Done". If the wizard displays the message "Can't reset", it simply means that the new calibration values will take effect next time you start the software. If the changes need to take immediate effect, simply close the GaumardUI software, wait about one minute (for the manikin to turn off), and then start the GaumardUI software again.

b) Options

The GaumardUI has several options that can be preset by the instructor.

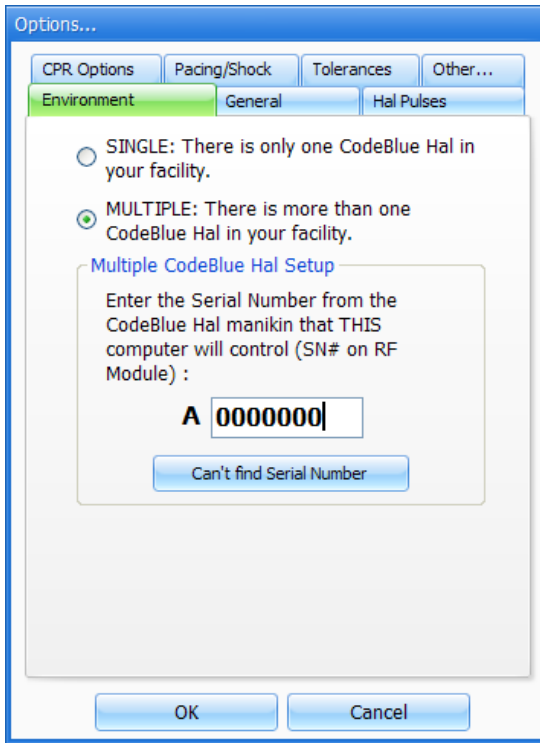


The "Options..." dialog box contains eight tabs: Environment, Tolerances, General, Hal Pulses, Pacing, CPR Options, and Other.



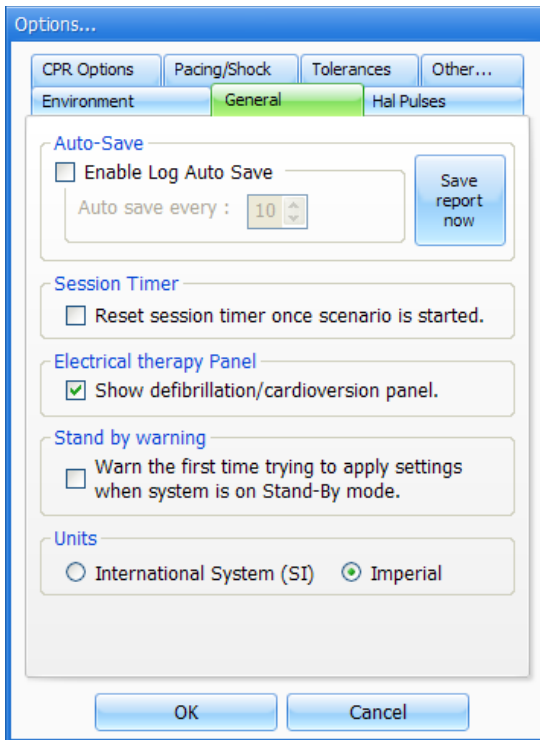
Each of these sections is further explained below.

(1) Environment



This tab allows you to choose how many HAL's you have in your facility. Notice that if the "MULTIPLE" button is selected, you must enter the correct manikin's serial number in the text box. If you cannot find the serial number try connecting to the HAL using "SINGLE" and then press on the button that says "Can't find Serial Number" and follow the instructions.

(2) General



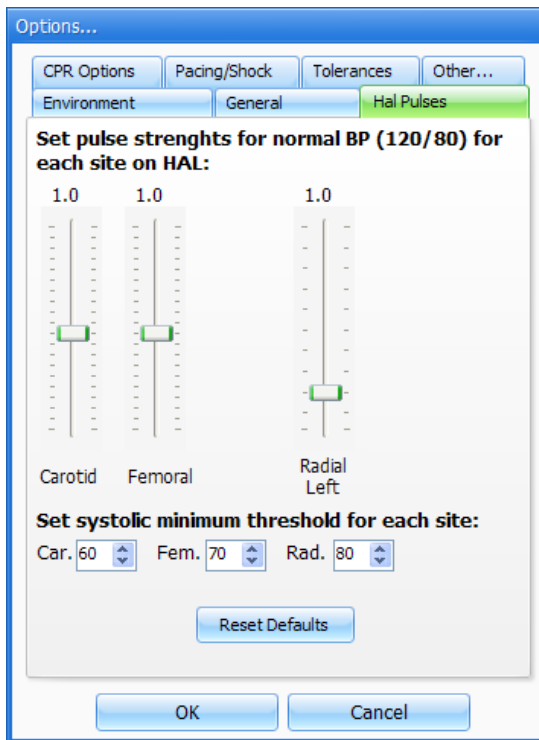
This tab allows the facilitator to:

- Enable auto saving of the log.
- Save your current log report.
- Enable stand-by warning.
- Select units (SI or English).
- Enable electrical therapy shock panel

The shock panel is a floating window used for simulating electrical therapy. It can also be used in conjunction with "auto-responses". For more information, navigate to [Section III.C.2.C](#)

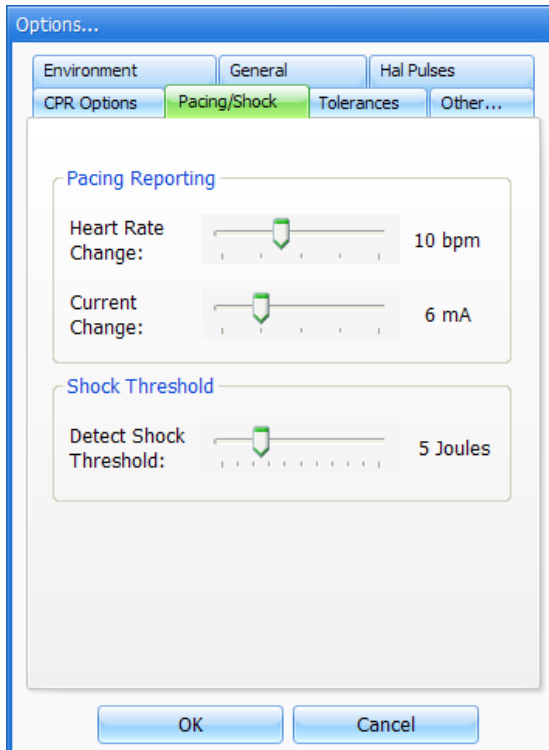


(3) Hal Pulses



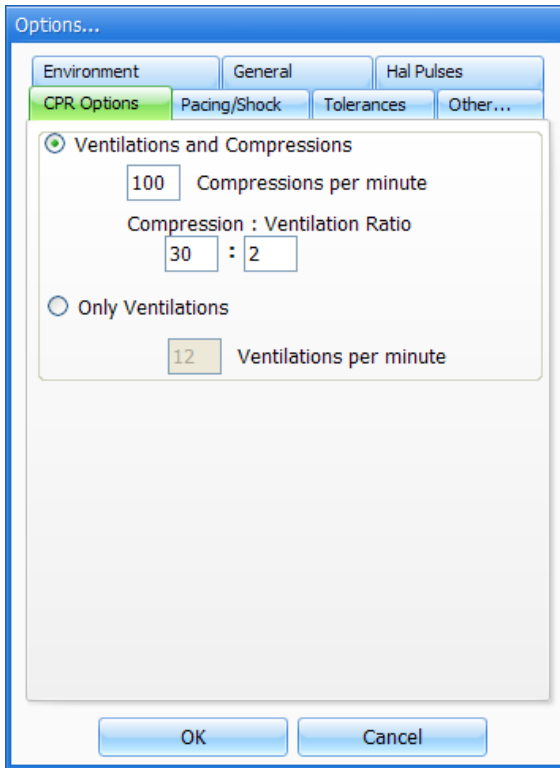
In this tab you can fine tune the pulse intensity for each desired pulse. The systolic minimum threshold represents the lowest value where the user can feel the pulse at each site.

(4) Pacing



When HAL is being paced; the pacers oscillate by a minimum fraction both on the heart rate and the current. This oscillation can make the software fire an event each time these small changes are captured. In this tab you can set a threshold for each parameter so that only changes greater than these settings will be taken into account by the software.

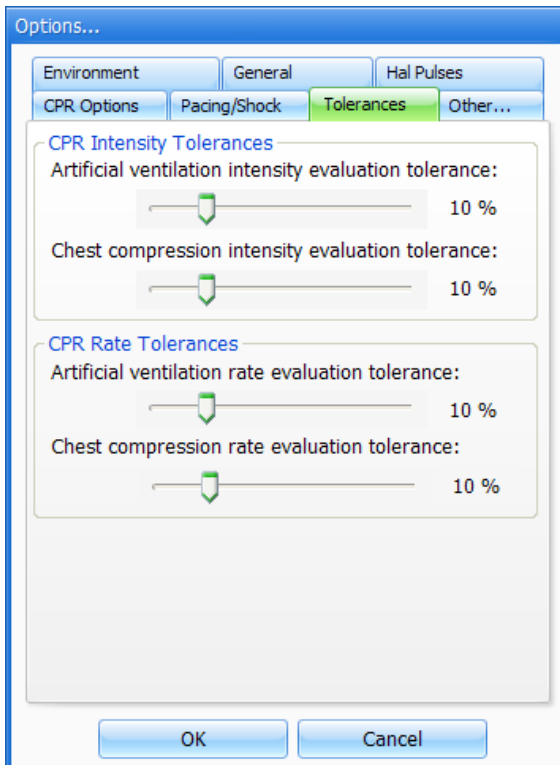
(5) CPR Options



In this tab you can:

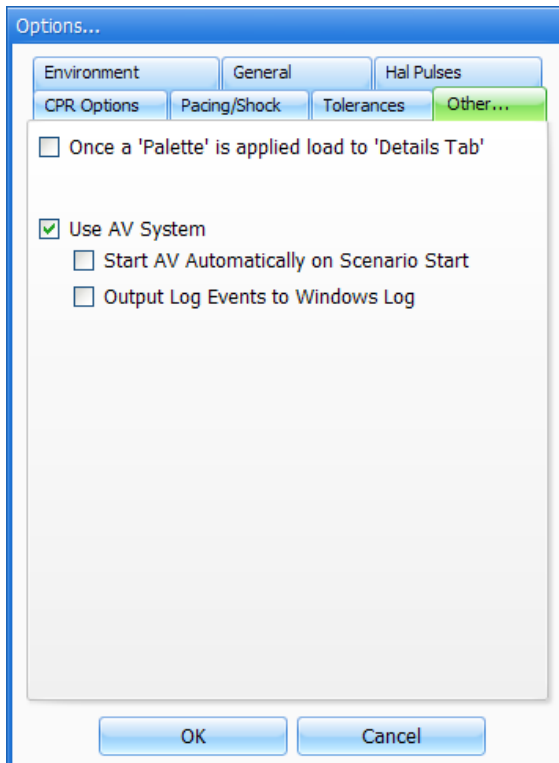
- Select the number of desired compressions per minute.
- Specify the compression/ventilation ratio
- Select number of ventilations per minute (if the 'Only Ventilations' button is selected).

(6) Tolerances



This tab is used to adjust the tolerance and intensity of both chest compressions and ventilations. The default values are 10%.

(7) Other



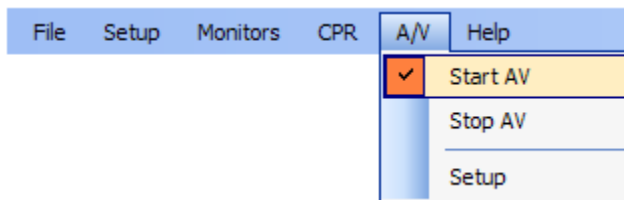
This tab gives you additional control over the simulation. The first option "Once a 'Palette' is applied load to 'Details Tab'" is useful for people that want to keep track of the latest parameter that were updated using the Details Tab.

The second option, "Use AV System" is used to enable the A/V Link.

NOTE: Please consult with your A/V System's manufacturer for compatibility with Gaumard's Simulators prior to setting up the A/V Link Interface.

GaumardUI is capable of interfacing with a number of third-party A/V recording systems that enable the capture of Audio and Video interlaced with the events recorded in the software log.

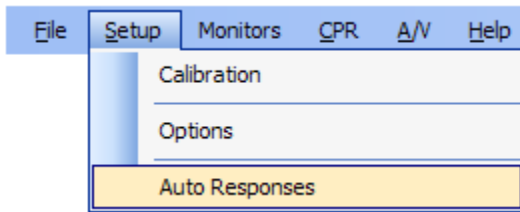
Enabling the AV Link displays the following A/V menu:



To configure the A/V feature, navigate to [Section IV.C.5](#)

c) Auto Responses

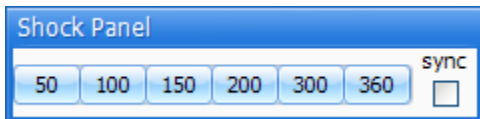
The software can be configured to respond to electrical therapy by automatically loading a palette when a shock is detected.



Auto responses configured from the set-up menu respond to shocks only when a scenario is not in progress. This type of auto response is referred to as a Non-Scenario Automatic Responses. To configure auto responses for scenarios, navigate to [section IV.B.5.a\)\(1\)](#)



Auto-responses will respond to electrical therapy equipment or to the provider's input through the Shock Panel.

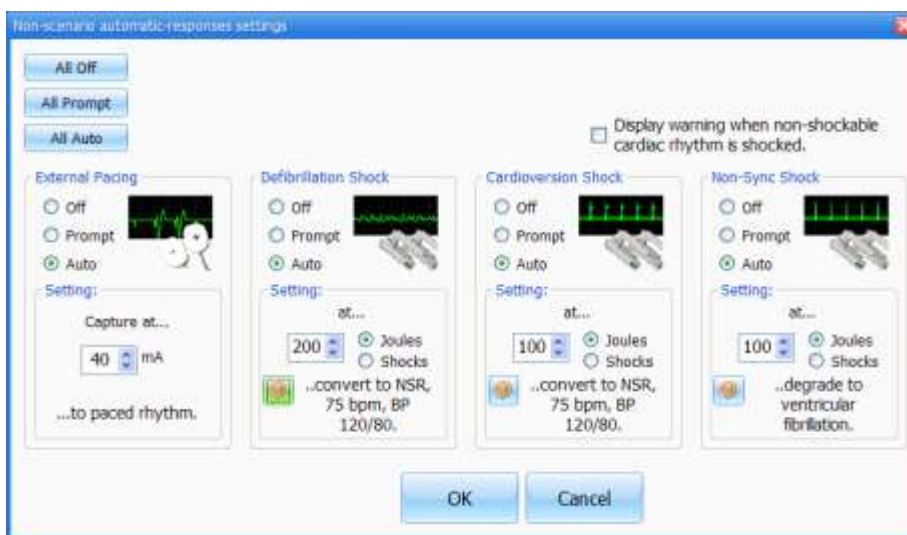


To enable the floating shock panel menu in the software, navigate to [Section IV.C.2.b\)\(2\)](#)

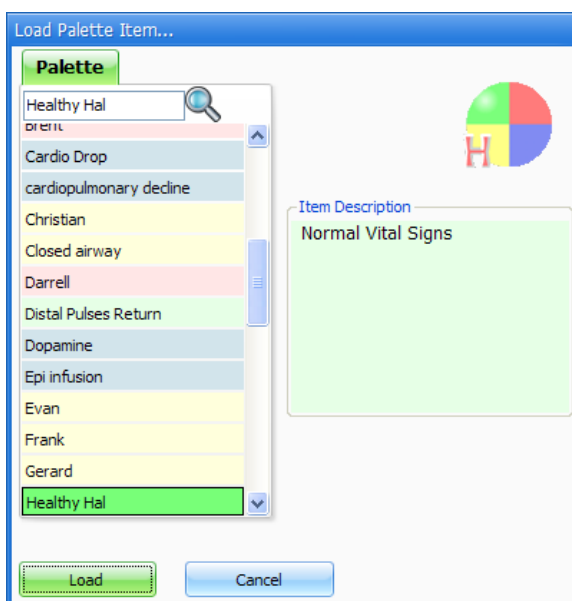
These three states are defined below:

- Off - The software **does not** respond to the electric therapy.
- Prompt - The software detects the electrical therapy and prompts the user if they would want to change the manikin's vitals to some preset healthy vitals.
- Auto - The software automatically detects the electrical therapy and compares it to a threshold selected by the provider, and once this threshold is accomplished the vitals automatically change to a healthy vital state.

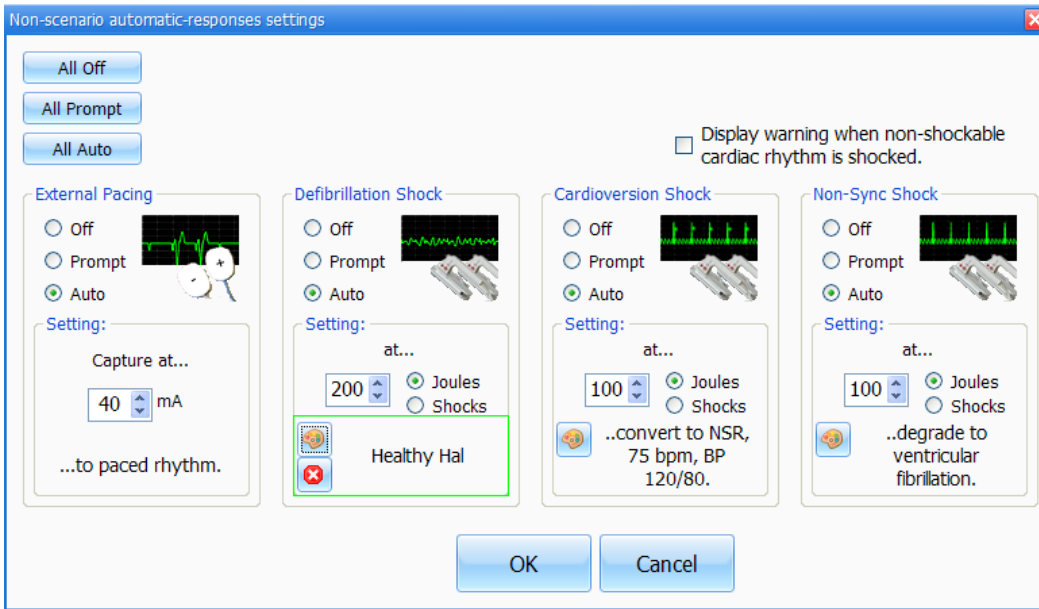
Click on the palette button to program a specific palette to be applied after the electrical therapy.



The "Load Palette Item" dialog box is displayed. Highlight the desired palette and click "Load".



The desired palette is now displayed in the "Setting" section.

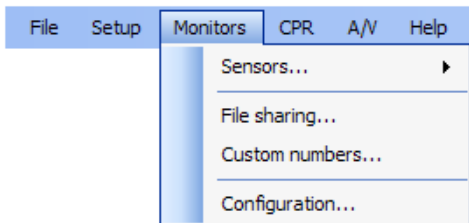


You can delete the palette by clicking the "X" button. Deleting the palette defaults the electrical therapy to NSR, 75 bpm, BP 120/80.

3. Monitor

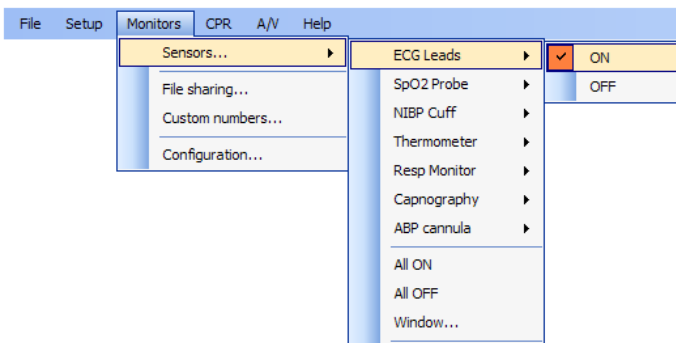
The Virtual Signs Monitor simulates a vital signs monitor attached to the simulated patient. The vital signs are synchronized between the facilitator's laptop and the secondary monitor. Virtual Signs Monitor allows the user to customize each trace independently of each other, users can set alarms, time scales, boundaries and grid options.

The “monitors” drop-down menu has the following options.



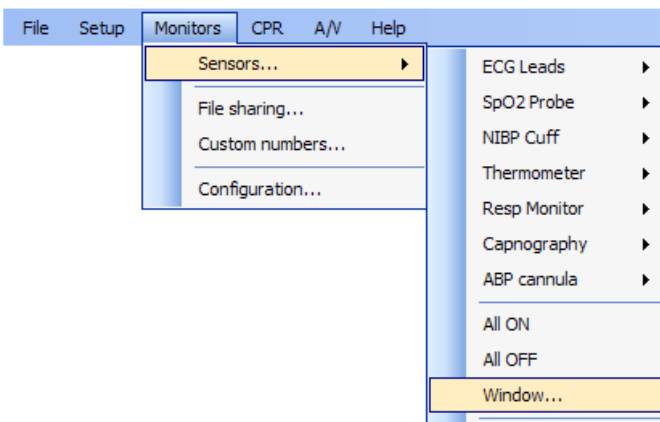
a) Sensors

This tool allows the facilitator to disable any of the wave forms present in the Virtual Signs monitor.



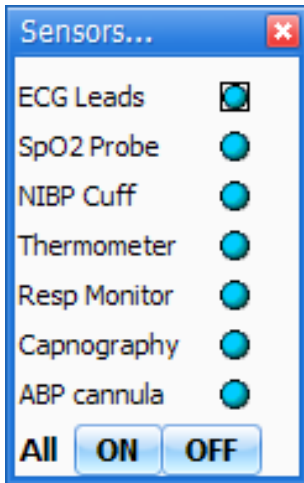
To disable any of the sensors, click All OFF. The virtual signs monitor sensors default to “All On.”

Another way to control the sensors is to go to Monitors → Sensors → Window.



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This option brings up a floating dialog box that can be viewed from any of the tabs in GUI. It can also remain opened as the users work in different scenarios. The "Sensors..." dialog box is displayed below:



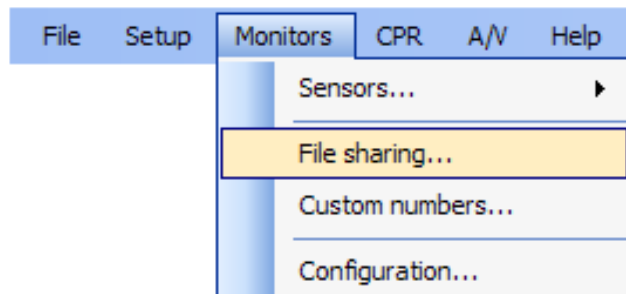
Light blue icons show active sensors and dark blue icons indicate disabled sensors. In the example above, all the sensors are turned on. This window can be used to quickly toggle sensors on and off.

b) File Sharing

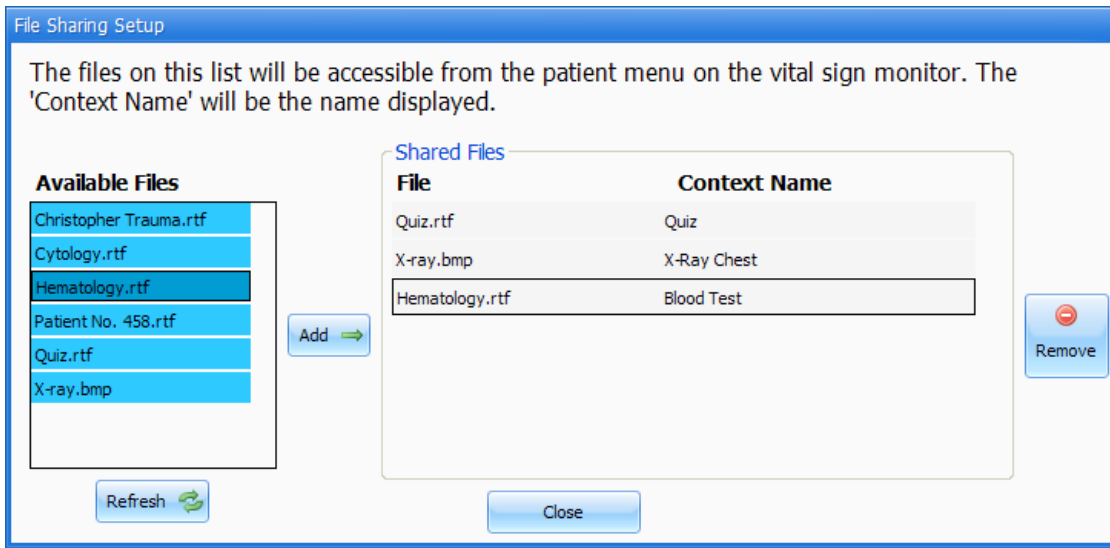
File sharing is only available when using the Gaumard Vital Signs monitor. To use this tool you must first locate the "GaumardUI" folder on the desktop (of the tablet). The folder must be shared for access by the monitor software. This can be done by right-clicking over the folder, selecting "Properties" and then "Enable Sharing". A shared folder will be marked as seen below.



Add to this folder any kind of files that you wish to share with students or providers. Then access the File Sharing Setup window from the GaumardUI Monitors menu.



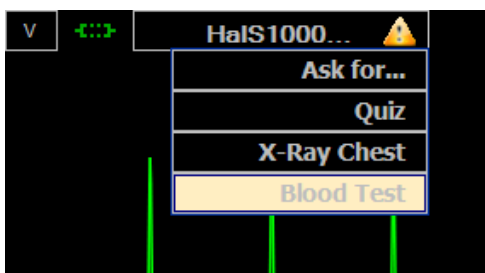
The File Sharing Setup menu is used to transfer and display files on the Virtual Monitor screen.



Files in the Gaumard_UI folder will be listed on the **Available Files** panel located on the left. To share a file, click on the **Add** button in the middle of the screen. Enter a context name on the pop-up menu and click OK. The shared file will appear on the right list box. You may remove individual files by using the remove button on the right.



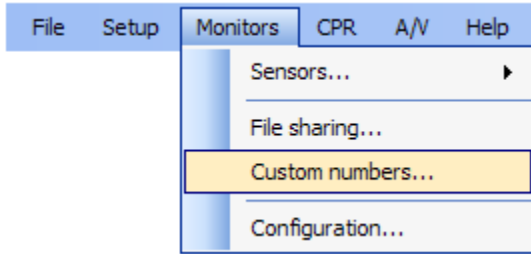
A yellow icon will be shown on the top left of the Virtual Monitor screen once a file is shared. This will inform the provider that a file is available for viewing.



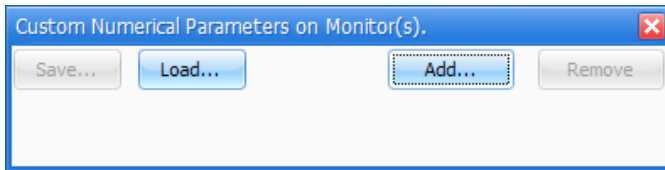
Click on the **HAL** S1000 button to bring down the selection of available files. Once a file is selected, it will automatically open on the Gaumard Monitor screen.

c) Custom Numbers

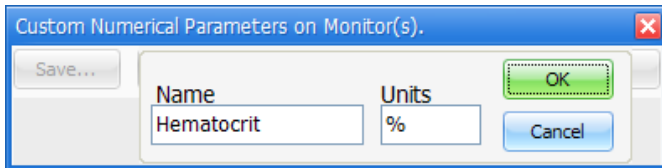
Use the custom numbers tool to add a new parameter, such as glucose level or platelet count, to HAL's virtual monitor.



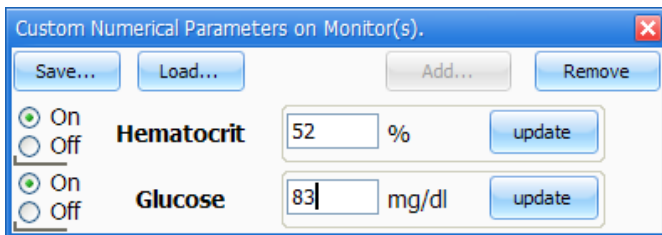
On clicking the "Custom numbers" option, the following window is displayed:



Click Add to enter a new parameter for display in the virtual monitor. This dialog box is displayed:

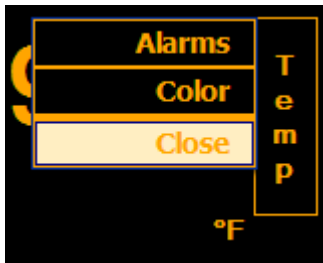


Enter the name and units of the new parameter and click "OK". The new parameter is displayed. Several custom numbers may be entered at a time.



Enter the amount to be displayed in the virtual monitors and click "update".

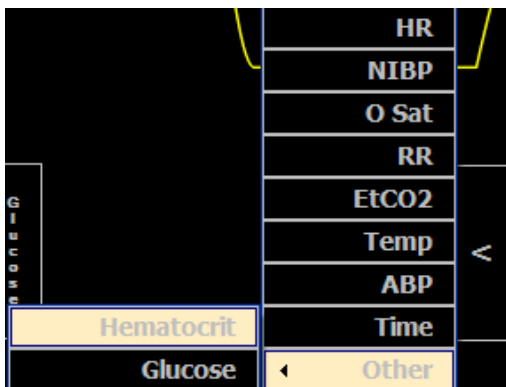
Have the student or provider close one of the parameters currently displayed by the virtual monitor by clicking on the button of the value to be removed, and selecting "Close".



Now the new custom number has a display slot.



Click on the button and select "Other". Choose the value to display.

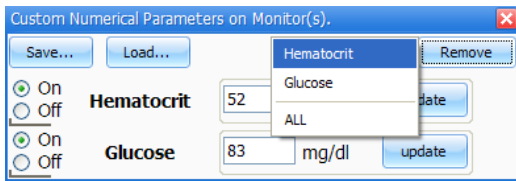


Do the same for as many new values as preferred for display. The figure below shows two new values: Glucose level and hematocrit levels along the bottom of the display.

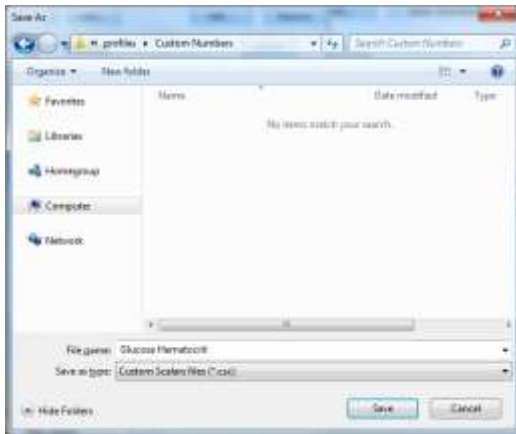


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Delete any parameter by clicking "Remove".

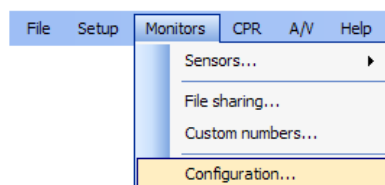


Save any list of added custom numbers by clicking on the "Save..." button. After clicking this button, the "Save As" window is displayed:

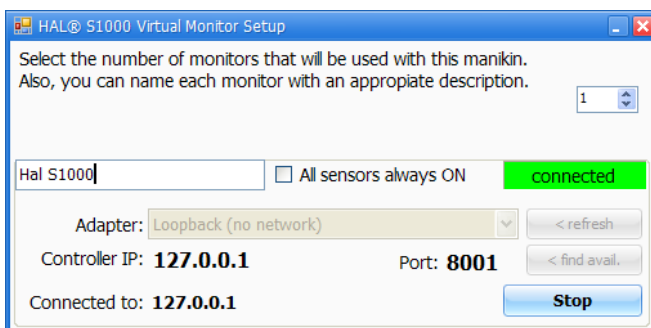


Type a file name, and click "Save". You can load any of the pre-saved combination of custom numbers by clicking on the "Load" button.

d) Configuration



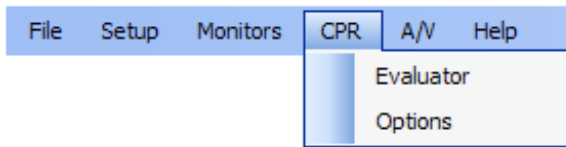
The configuration menu is used to verify the connection between the virtual monitor and the laptop. Clicking on the option displays the following dialog box:



The HAL software automatically loads the Virtual Monitor Software. Use this window to verify the connection between screens.

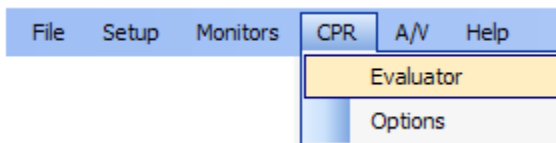
4. CPR

HAL can also be used as a teaching aid for CPR. There are a couple of features that allow the instructor to get some feedback on how well the providers are doing the CPR. Click on the CPR menu for those options.

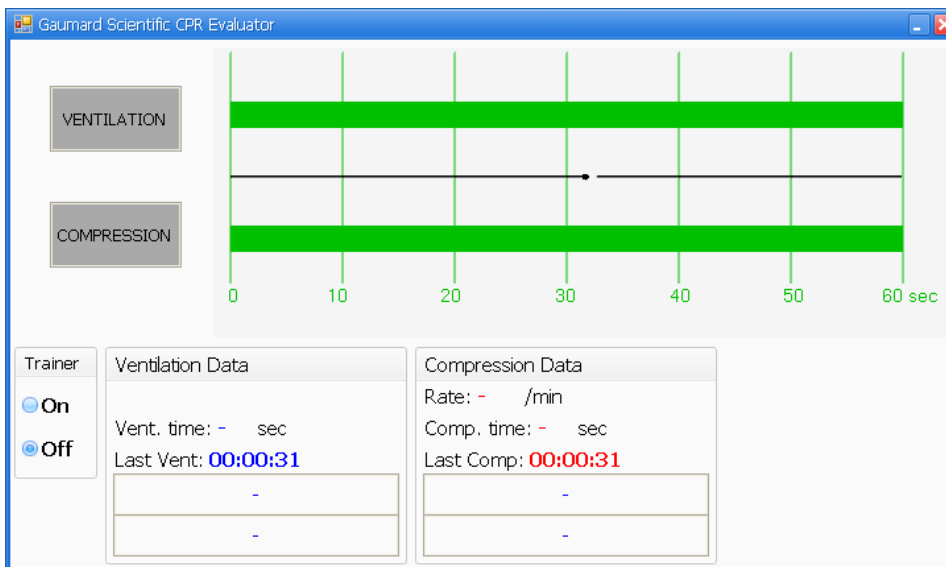


It is important to know that the chest compressions will only give feedback to the instructor if the heart rate is not set to a healthy state, and ventilations will only be reported if the respiration rate is set to **zero**.

a) Evaluator



This feature allows the instructor to get real-time feedback on the current compressions and ventilations being done by the providers.

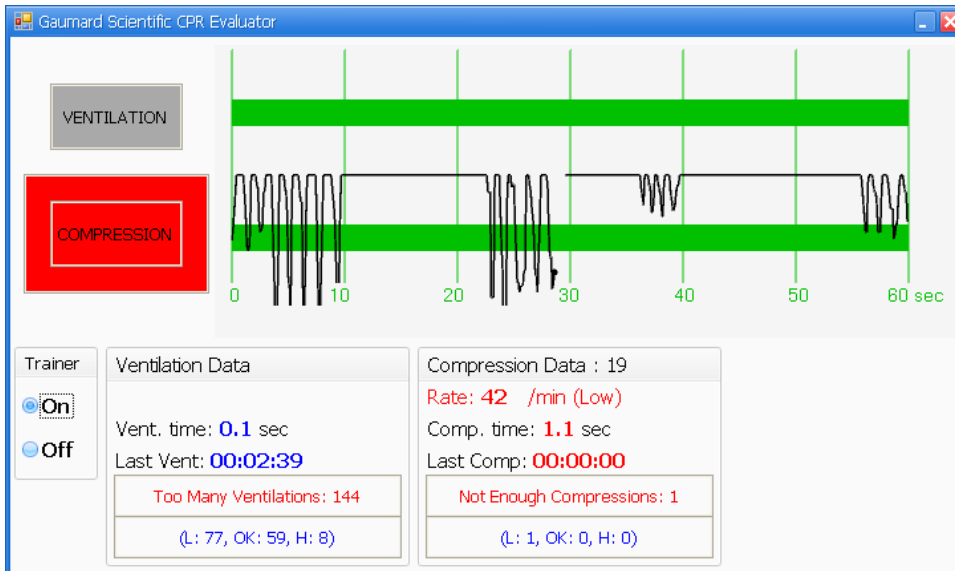
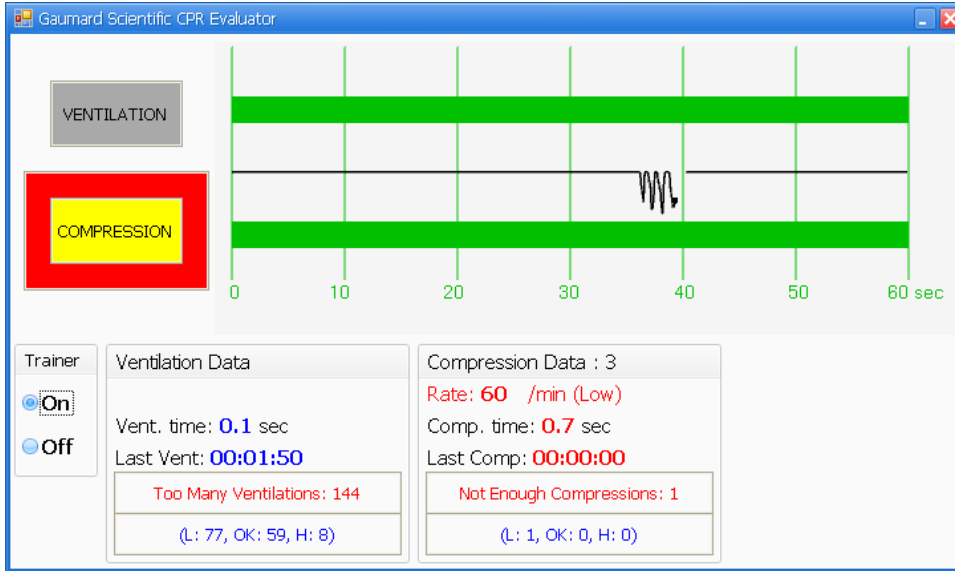


Open this window when your students or providers are ready to start performing compressions and/or ventilations. Click the Trainer to "On" as appropriate.

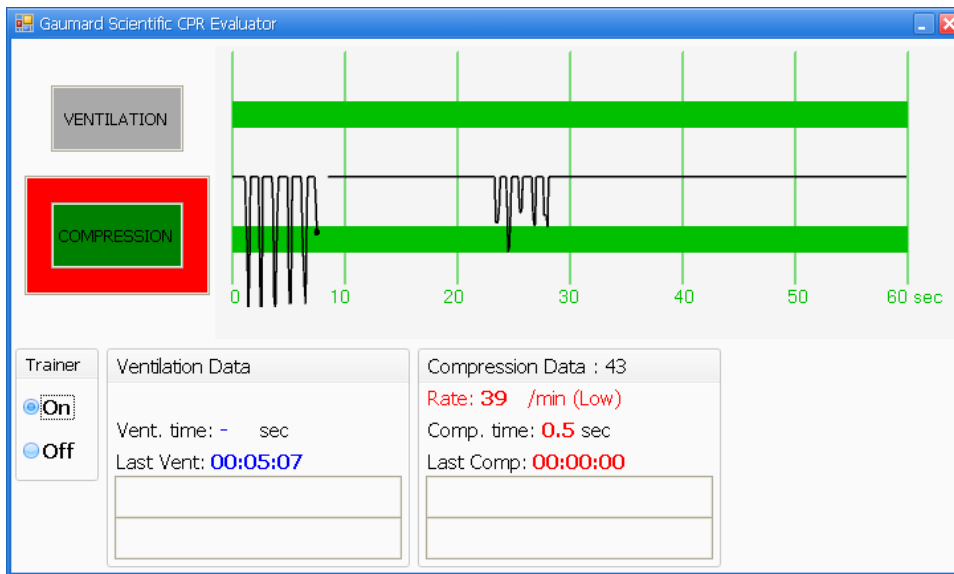
**Instruction Manual
HAL S1000**

When a ventilation or compression is detected, the label "ventilation" or "compression" will blink one of three colors: green, yellow, or red. Green represents a correctly-performed procedure, yellow means that it was too shallow or ineffectual, and red refers to an overly-forceful compression or ventilation.

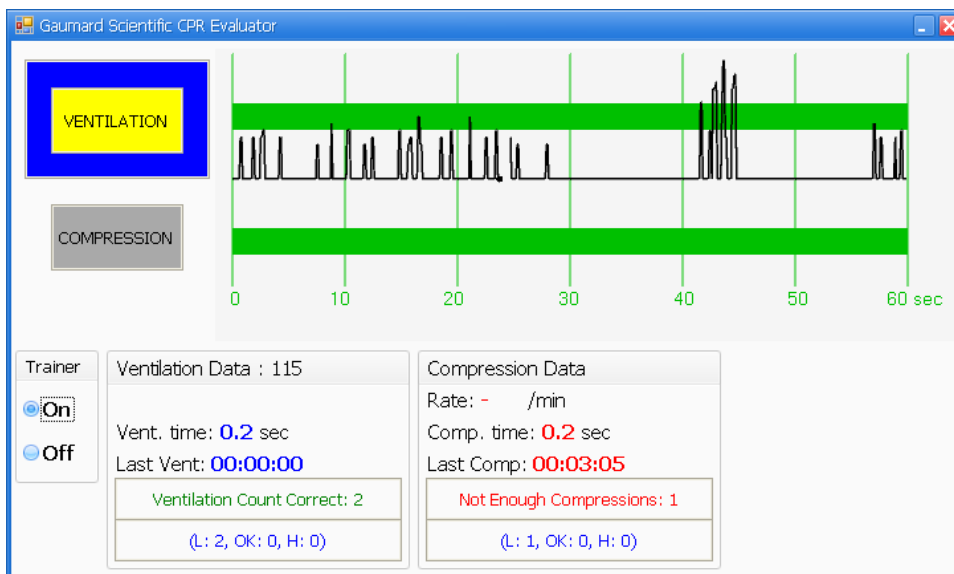
The examples below show the range of performance with the trainer frame-prompts on:



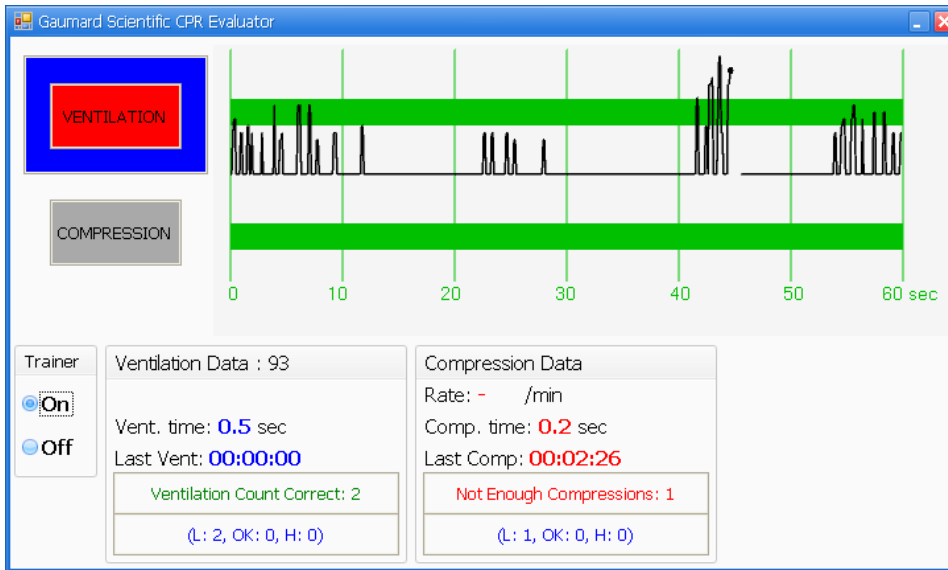
The waveform peaks either do not reach or exceed the green "Good" zone.



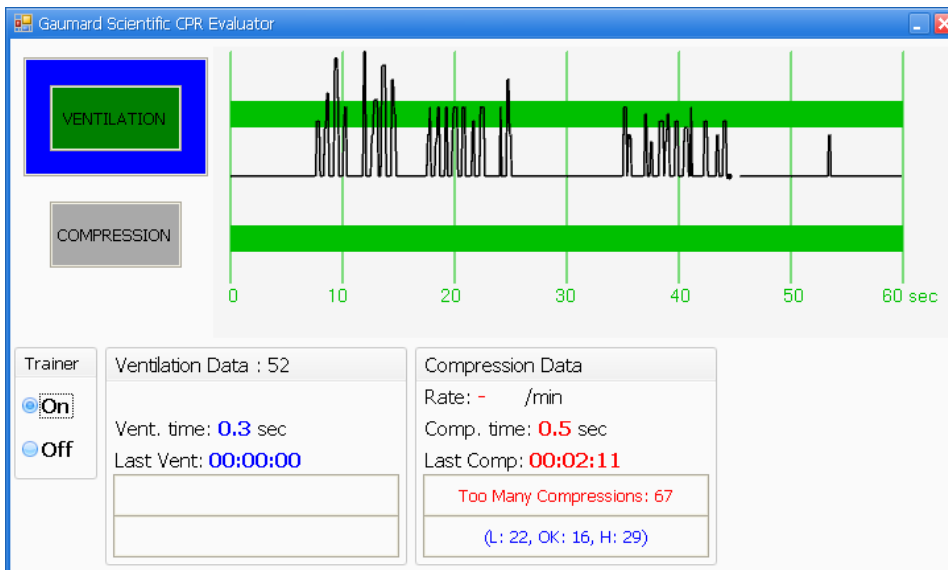
Here the waveform peak is entering the green "Good" zone. If the compression was as forceful as the preceding compressions, the green label will change to red.



Instruction Manual HAL S1000



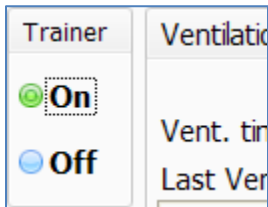
Again, the waveform peaks miss the green "Good" zone for ventilations.



Here, the ventilation peaks reach the green zone fairly consistently.

Trainer

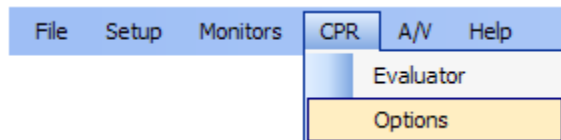
This feature can be used to help the students or providers create the correct rhythm of compressions to ventilation ratio.



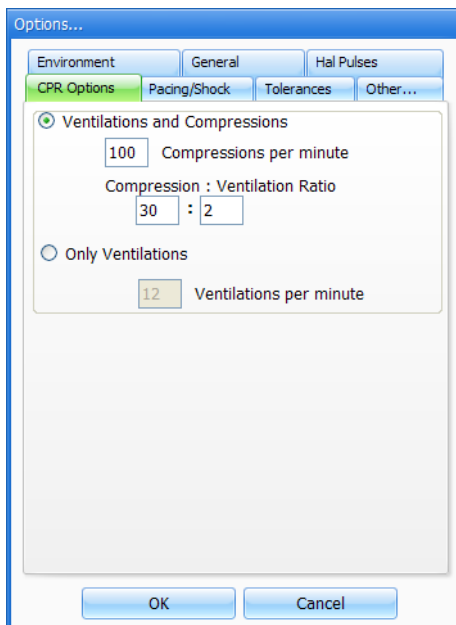
Turning the Trainer on will enable frames to flash around the Compression and Ventilation labels, prompting the provider to administer each procedure when the red or blue frame appears.

The instructor can change the CPR ratio on the trainer by going to CPR, Options.

b) Options



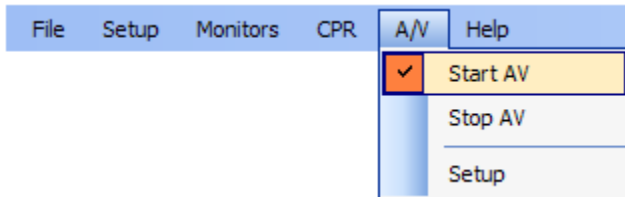
Clicking on Options under the CPR menu, will take to the CPR tab of the "Options..." window.



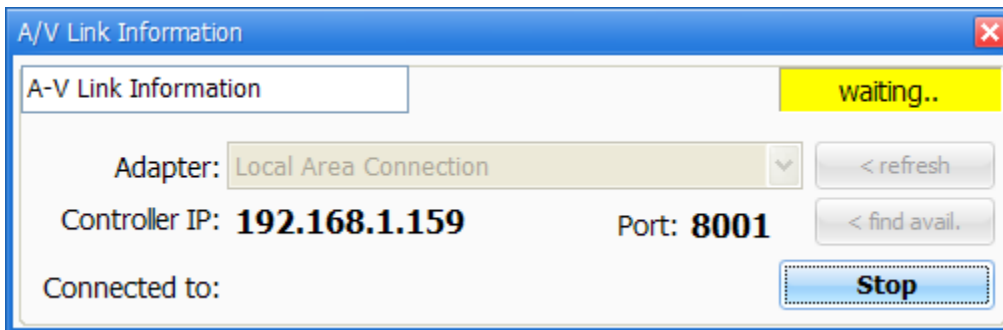
5. A/V

GaumardUI is capable of interfacing with a number of third-party A/V recording systems that enable the capture of Audio and Video interlaced with the events recorded in the software log.

Enabling the AV Link displays the following A/V menu:



Click "Start AV" to enable the Audio Video messages in the log system. Clicking on A/V, Setup displays the following dialog box:



This menu permits sending Start and Stop messages to the recorder, as well as displaying the connection status. In order to set up the connection on the A/V System side, please consult your A/V System's documentation.

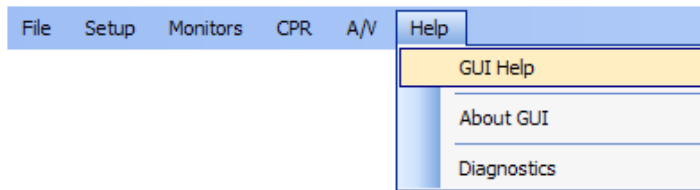
GaumardUI also permits automatic sending of a "Start Record" message to the A/V Unit.

NOTE: Because it is possible to extend a simulation session beyond the last step in a scenario, the "Stop Recording" message does not have an "automatically stop" option.

6. Help

The Help menu has three options: GUI Help, About GUI and Diagnostics.

a) GUI Help



"GUI Help" provides a soft copy of the entire HAL S1000 help manual. No internet connection is required to view the file.

b) About GUI

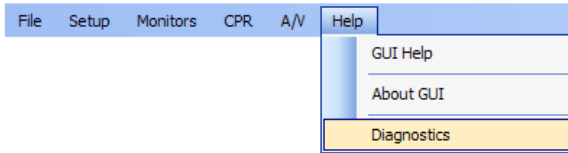
Clicking on "About GUI" displays the following dialog box:



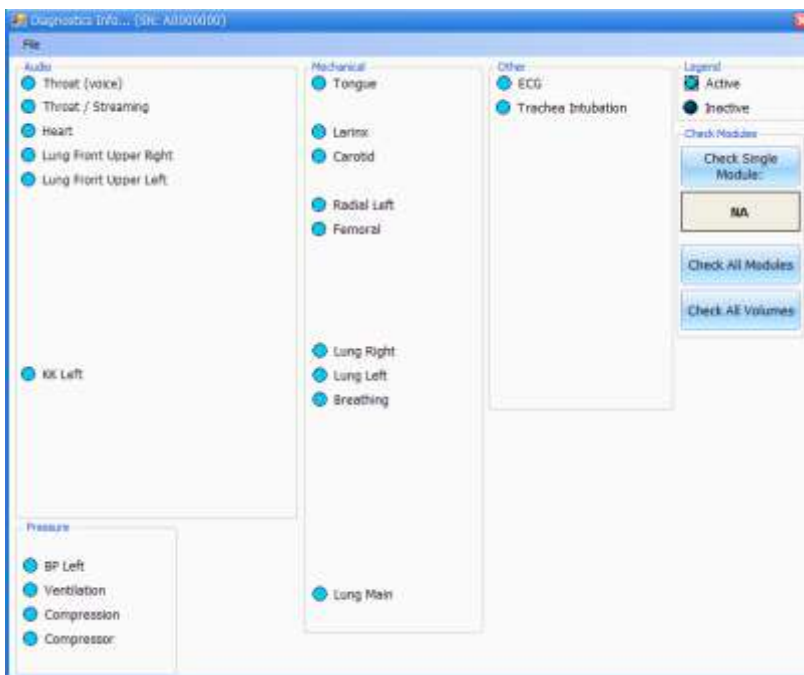
This dialog box gives you the version of the software you are currently using and also the firmware version.

c) Diagnostics

The Diagnostics dialog box can be accessed by going to the Help menu and selecting "Diagnostics". This dialog box is very useful for troubleshooting because it gives the user feedback on all of the working modules inside the manikin.

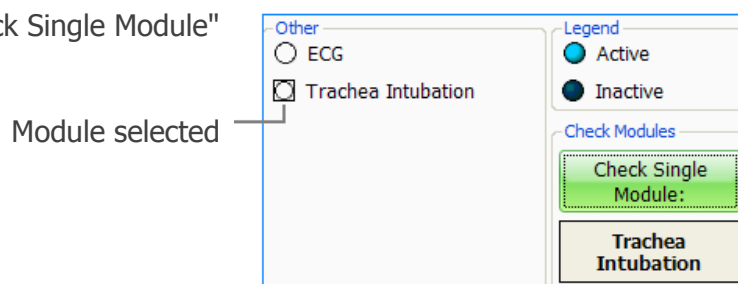


The user can click on the button that says "Check All Modules" and the software checks which modules are responding.



Also check individual modules by clicking on the module to test. Notice that the name of the module is displayed on the right column.

Now click on the "Check Single Module" button:



Active modules report light blue, and inactive modules report black. If there is a specific module that fails to respond please contact customer support (ensure that the module that is unresponsive is not specific to an Add-On feature that is not installed on your manikin).

V. Care and Cautions

A. Overall Warnings

Remember that damage caused by misuse is not covered by your warranty. It is critical to understand and comply with the following guidelines:

Procedures

Do not attempt to intubate without lubricating the airway adjunct with silicone oil lubricant (provided). Failure to do so will make intubation very difficult and is likely to result in damage.

When simulating drug administration **via endotracheal tube, providers must use an empty syringe**. Passing liquids into the trachea or esophagus may cause internal damage.

Talcum powder should be used sparingly on top of the lungs and ribs to eliminate any noise caused by rubbing of internal parts during breathing.

Mouth to mouth resuscitation without a barrier device is not recommended, as it will contaminate the airway. Treat HAL with the same precautions that would be used with a real patient.

IV arm

Only use Gaumard's provided simulated blood. Any other simulated blood containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

The use of needles larger than 22 gauge will reduce the lifetime of the lower arms' skin and veins.

When the arm veins require replacement, contact Gaumard to arrange for a lower arm exchange. For a small fee, we will deliver reconditioned and warranted lower arm assemblies to your facility. After receiving the replacement arms, use the same box and the enclosed shipping label to return the old arms to Gaumard. For international and express service, additional fees may be charged. Refer to the Consumables and Replacement Parts section of this guide, and contact customer service for more information.

Storage

Store HAL in a cool, dry place. Extended storage above 85 degrees Fahrenheit (29 Celsius) will cause the manikin to soften and slowly warp. It is acceptable to *operate* HAL[®] at an ambient temperature of 95 degrees Fahrenheit (35 Celsius).

Do not store the simulator with a discharged battery. It is good practice to re-charge the battery at the end of every simulation session. In addition, make sure the battery is re-charged at least once every 6 months even if the simulator is not being used; otherwise permanent loss of capacity might occur because of self-discharge.

Cleaning

HAL should be cleaned with a cloth dampened with diluted liquid dishwashing soap. If medical adhesives remain on the skin, clean with alcohol wipes. **DO NOT USE "GOO GONE"** as the citric acid in the formula will cause pitting of the various materials comprising your manikin.

HAL is "splash-proof" but not water-proof. Do not submerge or allow a large volume of fluid to enter the interior of the manikin. Do not expose the tablet computer to water or excessive dust unless it is protected by a rugged case (available separately).

Set Up

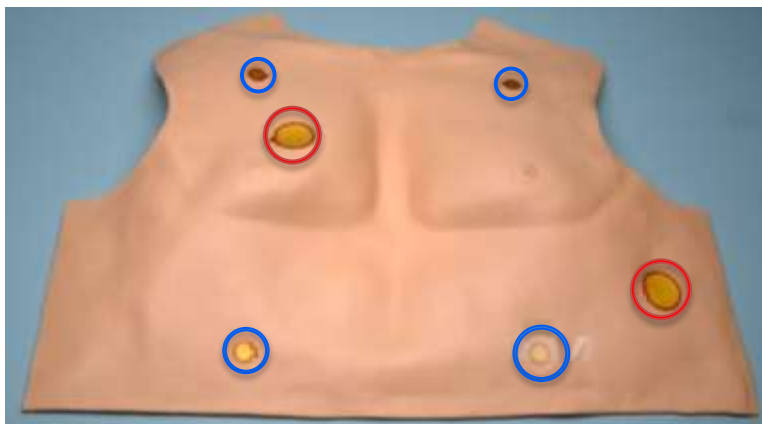
Replacing the battery should only be done while HAL® is in **STAND-BY** mode or when the software is not running. Refer to the Equipment Set-up section of this guide for more details on power modes.

When connecting the battery to the manikin, make sure to **match the two color-coded connectors to the corresponding color-coded battery terminals.**

NEVER disconnect the communications module while the HALUI software is running. The software will halt, and the module may be damaged.

B. Electrical Therapy

Defibrillation is only allowed on the large sternum and apex sites, circled in **RED** below. NEVER deliver a shock to ECG electrode targets on the shoulders or waist, marked **BLUE** below. Doing so will not create a fire hazard, nor is there risk of shock to the provider, but internal damage in HAL may result. This situation is considered improper use and is NOT covered by the HAL warranty. The system will require repair at our facility.



There are inherent dangers in the use of some medical devices. For simulations that incorporate electrical therapy of any kind, always know your equipment, and follow the device manufacturers' safety guidelines.

ECG and electrical therapy checklist and warnings:

- Only deliver electrical therapy when the simulator is fully assembled, dry, and undamaged.
- Make sure the defibrillation patches on the simulator are in good condition, including removing any and all gel residue on the defibrillation patches from previous use(s). It is a good practice to remove gel residues after every use. Failure to do so will leave behind a film of electrode gel that hardens causing arcing and pitting.
- Do not re-use the gel-adhesive pads. Do not leave them on for next day use.
- Use hard paddles or wet-gel pads preferably. Avoid using solid-gel pads since they present higher risk of burning the simulator's skin.
- Gel pads have a shelf life. Make sure they are not expired to avoid arcing.
- Make sure the simulator is not in contact with any electrically conductive surfaces.
- Use the simulator only in a well-ventilated area, free of all flammable gases.
- NEVER attempt to service or modify any of the electrical connections, especially those between conductive skin sites and the internal electronics. Discontinue use if any wires are found exposed with damaged insulation. Real medical products, especially electrodes, sometimes use powerful adhesives that can be difficult to remove. A gentle, degreasing cleanser may be needed. Refer to Care and Cautions for more information.
- Electrode gel on the skin between any two electrode targets can become a pathway for electrical current, just as in real life. If this occurs, HAL's skin can be burned.
- Do not allow defibrillation pads to overlap ECG sites. Doing so will may damage the simulator and cause arcing.


VI. Appendix

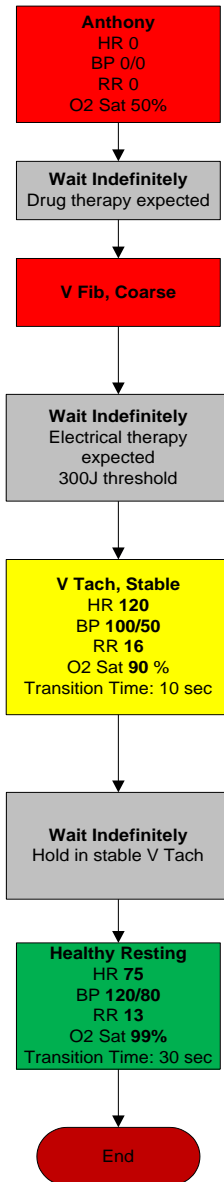
A. More about Scenarios


1. Factory Preset Scenarios Flowcharts

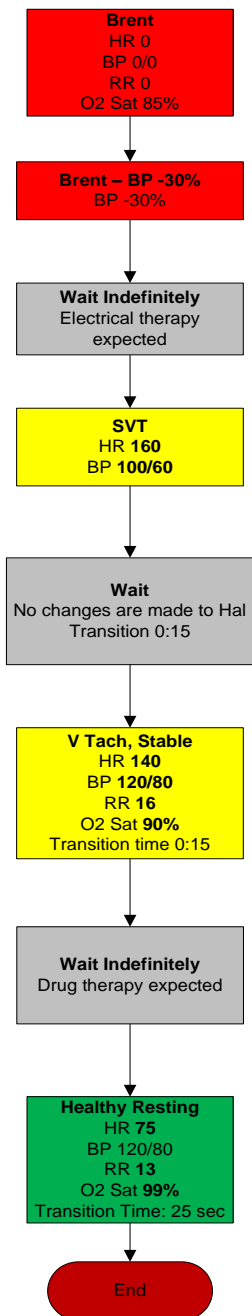
[Quick Start HAL](#)

	Scenario Name	Type
1	Anthony	Linear
2	Brent	Linear
3	Christian	Linear
4	Darrell	Linear
5	Evan	Linear
6	Frank	Linear
7	Gerard	Linear
8	Bradycardia	Branching
9	Pulseless Arrest	Branching
10	Tachycardia	Branching


 Gaumard® Simulators for Health Care Education	HAL® Anthony
77-yr old man is found pulseless and apneic.	

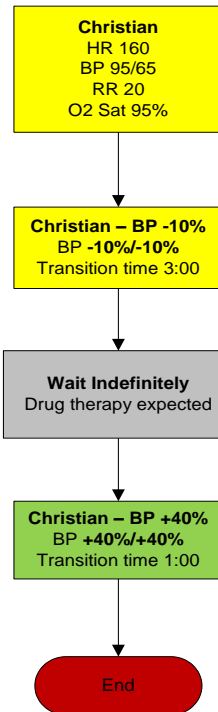


 <p>Gaumard® Simulators for Health Care Education</p>	<p>HAL® Brent</p>
<p>55-year old male complains of substernal chest pain radiating to the jaw . Patient is diaphoretic, trembling, and has a waxing and waning mental status.</p>	



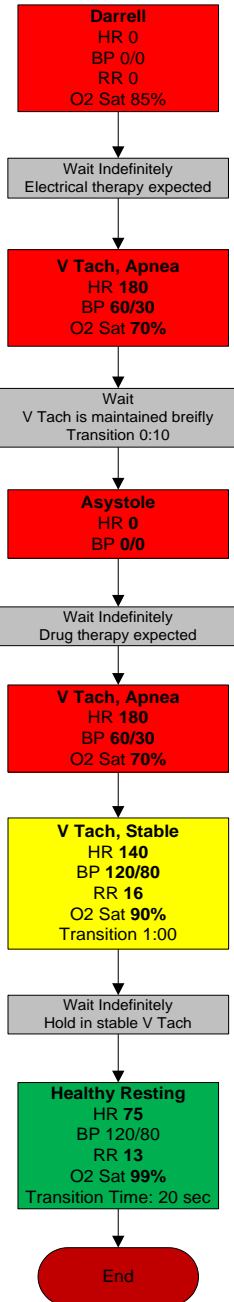
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	HAL® Christian
18-yr old college freshman calls EMS after taking a caffeine preparation prior to exams . He is short of breath and says that his heart is "beating fast and funny."	

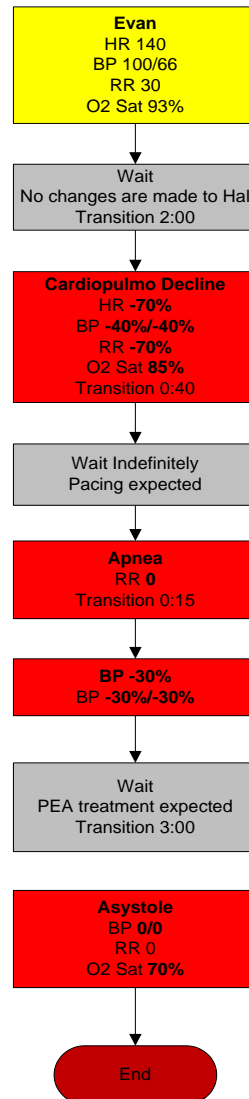




65 year-old complains of dizziness and shortness of breath. He has a history of emphysema and does not know how much "breathing medicine" he has taken. During the interview, his eyes roll back and he slumps in his seat, unresponsive. (No peripheral IV sites are available.)



	HAL® Evan
72 year-old is found tachycardic and tachypneic. He is disoriented and barely responsive. Patient's wife says that he has both heart and lung trouble and that they have been unable to afford his medicine in the past month. (After "apnea" item, facilitator should set scenario auto-response to pacing to "none" to simulate loss of capture.)	



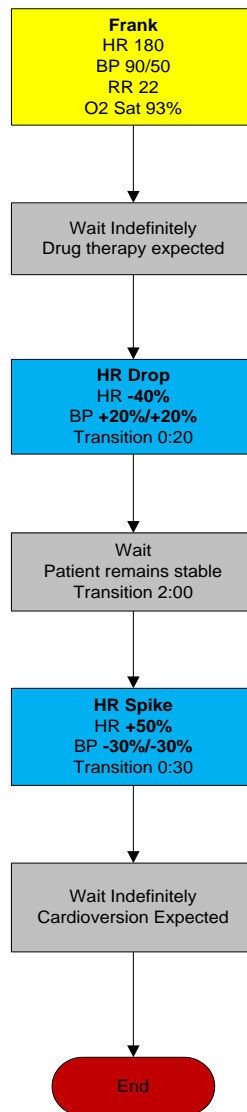
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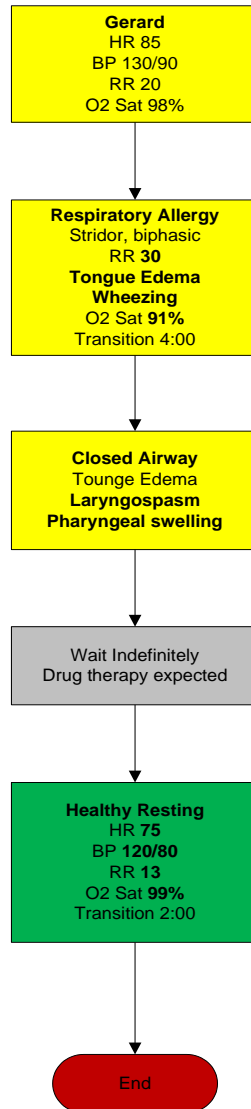
Gaumard®
Simulators for Health Care Education


HAL®
Frank

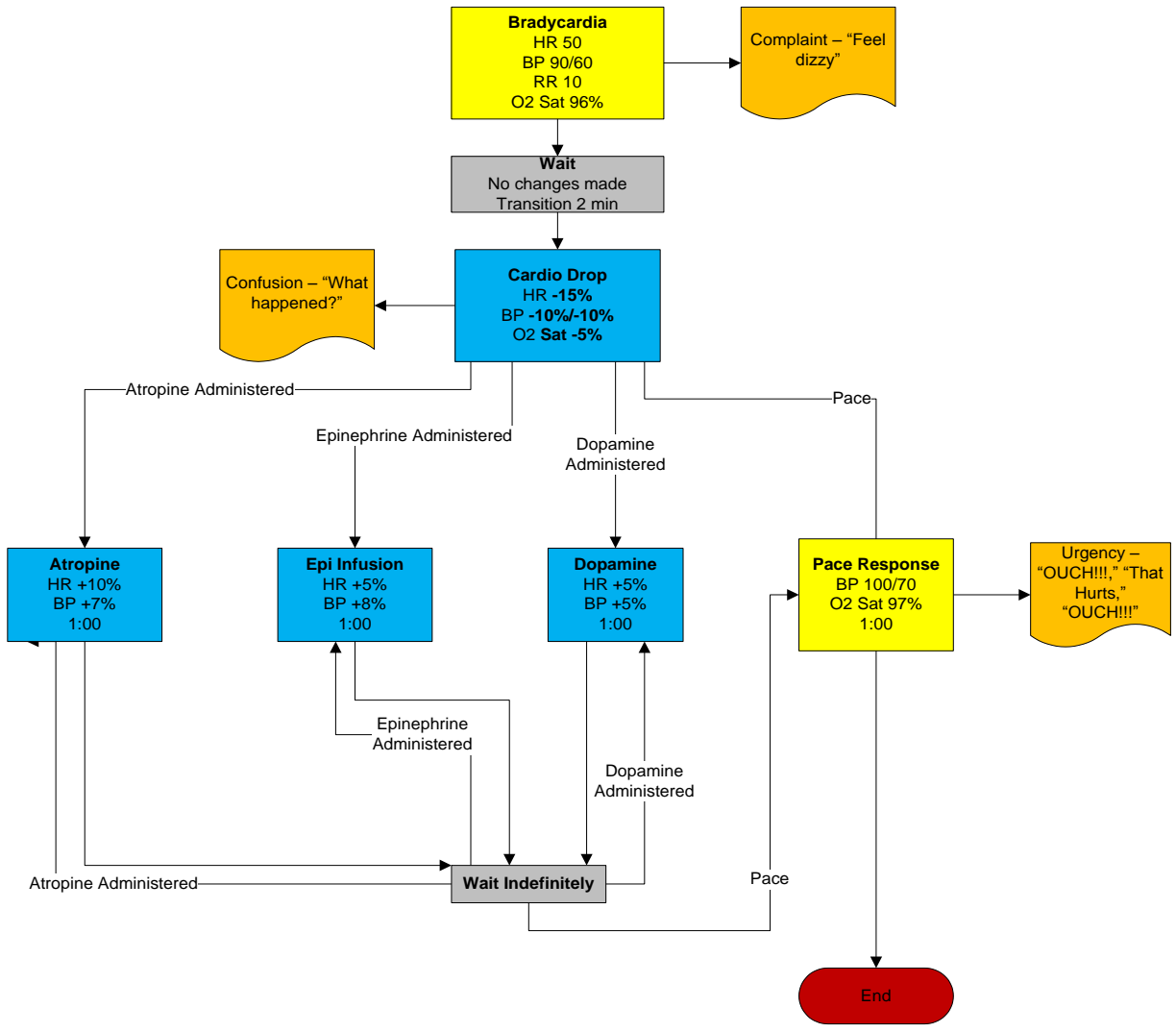
50 year-old found at home complains of weakness and fatigue. He is conscious and alert but slightly short of breath. An empty bottle of digoxin sits on his bedside table. (He will claim not to have taken any in several days. Pharmacological rate control will only be effective briefly.)




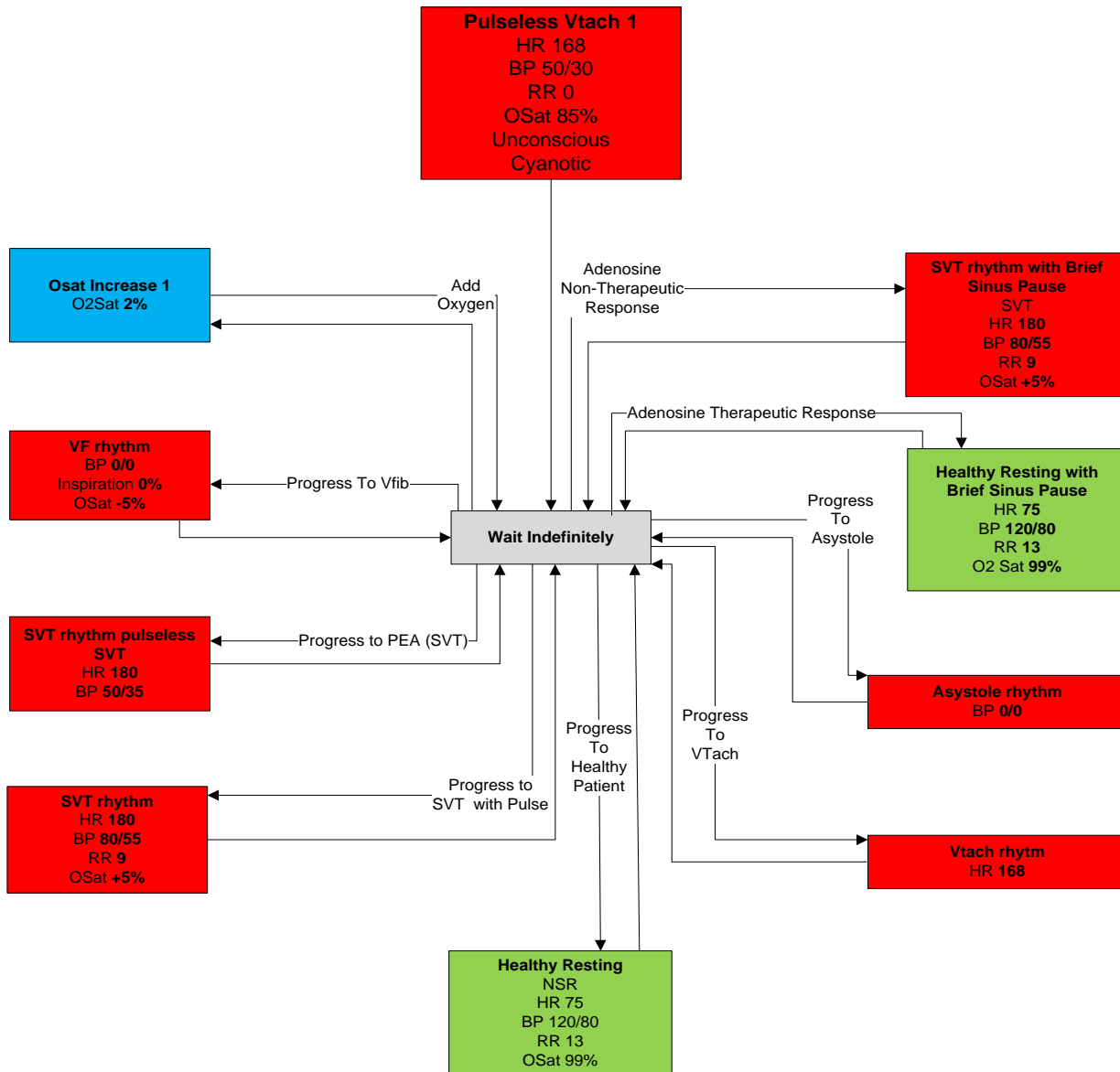
 <p>Gaumard® Simulators for Health Care Education</p>	<p>HAL® Gerard</p>
<p>35 year-old man calls for help at local restaurant after onset of alarming respiratory symptoms . (Patient experiencing allergic reaction to food , asthma attack, or exposure to inhaled toxin.)</p>	



	HAL® Bradycardia
An in-hospital patient is diagnosed with Bradycardia and requires immediate attention. Note: for this scenario to function as intended the instructor should enable automatic pacing capture in the 'Setup -> Auto-Responses' menu.	



	HAL® Pulseless Arrest
A young male was found unconscious.	



2. Tips on Creating Scenarios

Thinking in Terms of Palette Items

As described previously, Palette items represent complete or partial groups of settings that have been stored as a single item. We learned how applying partial states will hold constant all settings that are left unspecified.

Not only does it take time to customize the palette, but a very large palette becomes difficult to navigate. So, it is desirable to minimize the number of Palette Items in each Profile. To accomplish this, an experienced facilitator tries to create items that are as generally applicable as possible and can, thus, be applied to a wide range of scenarios. The key is to only include in your Palette Items the settings that are directly related to the physiological event represented by that Palette Item.

Smart Scenarios

After reading the Details, Palette, and Scenarios sections of this guide, it should be clear how to build a scenario. You may have already tried building your own or modifying some of the factory presets. The following four guidelines will refine your ability to build the best possible scenarios.

1. How will the scenario begin?

The first thing to consider is the initial condition of the patient. Create a Palette Item to describe this condition. Make sure that this first step in the scenario is a complete state. That is, indicate some selection for each and every available setting on the Details page. Remember that only the settings you specify will cause a change in HAL, and all other settings will remain constant. So, by starting with a complete state, HAL's condition will always be the same when the scenario starts, regardless of what he was doing previously.

Likewise, the "transition duration" of the first step in the scenario should be zero, indicating that changes are applied immediately.

There is one point that can cause confusion and warrants further explanation. It is an extension of the above discussion of partial states. The issue is best illustrated through the following example:

Suppose that you are creating a Palette Item to start your scenario. In this case, you have decided that the patient will be apneic. The question is, "How should the lung sounds be set?"

Most people's first inclination is to set the lung sounds to "none." This is incorrect, despite apnea. Obviously, no lung sounds should be heard during apnea, but since you have already set respiratory rate to zero, none will be. (Sounds are synchronized to the breathing cycle.)

What you are really setting here when you choose a lung sound is the condition of the lungs, given respiratory drive. That is, if the patient's respiratory rate were changed from zero, what sound would be heard? Assuming that the lungs themselves are normal in this scenario, you would choose "normal" for the lung sound setting.

Then, as the scenario progresses, if the patient starts breathing, there will be no need to set the lung sound again. It will already be set. The same principle applies to the heart sound and other settings.

2. Include notes to guide the facilitator during the simulation.

It is common for scenario designers, especially those who act as facilitators, to neglect the importance of notes in the scenario. They think that they will remember the learning objectives, patient history, and other details at the time they are ready to conduct the simulation. They usually don't, especially when revisiting a scenario months after creating it.

When you add "Wait" and "Wait Indefinitely" steps to a scenario, you have an opportunity to edit the item description. Use this description field to hold notes to the facilitator. Typically, scenario designers write notes in that space to indicate what the provider(s) or facilitator should be doing at that point.

Further, when saving the scenario, you may edit the scenario description. This is the best place to put patient history and any other longer notes and instructions.

3. Assume that providers will do the right thing.

Usually, you should create a scenario with the assumption that the providers will perform correctly. As long as they do, the scenario can simply be allowed to continue.

Naturally, you must be prepared for what might happen to HAL when providers deviate from expectations. The consequences of such deviations can sometimes be included in the scenario, punctuated by "Wait Indefinitely" items. In other cases, the simulation will require more direct control by the facilitator via either the Palette or Details page.

4. Choose auto-response settings based on the scenario content and the objectives.

As you've seen, auto-responses can be used to free the facilitators attention. They also enhance realism by presenting instant reactions to the care providers. On the other hand, sometimes it is not possible or desirable to determine the responses before the simulation begins. Different environments and applications call for different settings.

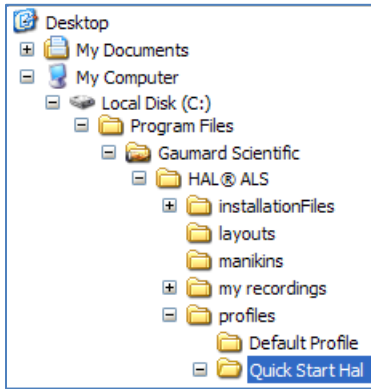
Some teaching practices are best done with the auto-response settings in Prompt mode. Responses must be triggered by a vigilant facilitator. Though it is slower and requires more attention, the benefit of Prompt over other modes is that the simulation can be allowed to go in any direction, and it will be possible to choose the response on a case-by-case basis.

Other learning exercises require a higher degree of automation. For such applications, most facilitators choose Auto mode for the auto-response settings. The key issue is standardized timing of symptom presentation. A consistent, repeatable simulation is essential for fair assessment of that care provider in relation to others and for the broader interpretation of results in the context of training validation studies.

When in doubt, it is best to choose *Prompt* mode, in which the facilitator will be given direct control of the responses as events are detected.

B. File Structure

Advanced users may find it helpful to understand the GaumardUI directory structure. With direct file manipulation, one can easily move palette items and scenarios between profiles, as well as move entire profiles from one computer to another.



Profiles

In the GUI program folder is the “profiles” sub-folder (e.g. “C:\Program Files\Gaumard Scientific\HAL ALS\profiles”). All user information is saved there, and it is the only folder that should be modified manually. In the example shown, notice that there are two profiles in this installation, “Default Profile”, and “Quick Start Scenarios”.




Palette Items

Saved as “*.plt” files, palette items in each profile are located at the top-level of each profile folder. To copy palette items from one profile to another, simply copy the .plt file found in the source profile folder.

Scenarios

Scenarios are stored as sub-folders within profile directories. Scenarios can also be transferred between profiles by copying the scenario folder and its contents.

NEVER...

-  modify files in the “resources” directory or those at the top-level of the “Gaumard User Interface” directory.
-  manipulate files or folders while the GaumardUI software is running.
-  modify or delete “*.dll”, “*.scn”, or “*.sys” files.

C. Troubleshooting

1. General Troubleshooting Guide

Use the following table to find causes and solutions to a number of possible problems.

Symptom	Possible Cause	Solution
Communication never gets established or is lost (blinking communication indicator is consistently red)	Data cable is not connected. USB Module is not connected.	Verify connection of the Ethernet cable and USB module to the computers USB port.
Chest compressions are not properly detected or not detected at all	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "blinking communication indicator is consistently yellow"
	Is the respiratory rate set to "0 / min"? Chest compressions are only detected when the respiratory rate is set to 0 per minute (0 / min). Otherwise they are ignored	Set respiration rate to zero
	All others	See "Calibration Wizard" section inside User's Manual
Artificial ventilations are not properly detected or not detected at all	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "blinking communication indicator is consistently yellow"
	All others	See "Calibration Wizard" section inside User's Manual
Simulator's chest does not rise with artificial ventilation (e.g. BVM)	Simulator not running	In some simulators, the trachea is disconnected from the lungs when they are not on.
	Disable lung/s	Enable the lungs from "Detail" page on the GaumardUI software
Low chest rise (or no chest rise at all) while breathing	Wrong settings or disabled lungs	Make sure lungs are enabled and both respiration rate and inspiration percent are different from "0". Try changing the respiration rate to a different value, and if still nothing happens, try turning the manikin off and restarting everything to make sure the internal air compressor gets its initial settings

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Symptom	Possible Cause	Solution
	Low air volume (HAL® only)	Set Respiration Rate to 13, and Inspiratory Time to 33%. Allow it to run at least 5 minutes and then using a small screwdriver, turn slowly clockwise a black screw located in HAL®'s lower back until desired chest rise
Loss of brachial pulse	Brachial pulses disabled	Make sure to enable brachial pulse on "Details" tab page
Pre-built scenarios don't show up		<p>Select "Quick Start Scenarios" when starting the software.</p> <p>Should user forget to do so, there's no need to shut down the software and open it again in order to load the pre-built scenarios. Go to "File/Profile" menu and then select "Modeled Scenarios"</p>
A sound is absent or is not heard at desired volume level	Volume not set to user's criterion.	Every sound has a volume control. Play with the volume control to get it to the desired level.

2. Microphone Boost for Streaming Audio

Use the instructions below to increase the streaming audio volume. The Headset must be connected to adjust the microphone volume properties. In addition, adjust the volume and recording control on the headset's physical control.

1. Right click on the speaker icon located on the bottom right corner of the laptop's taskbar.



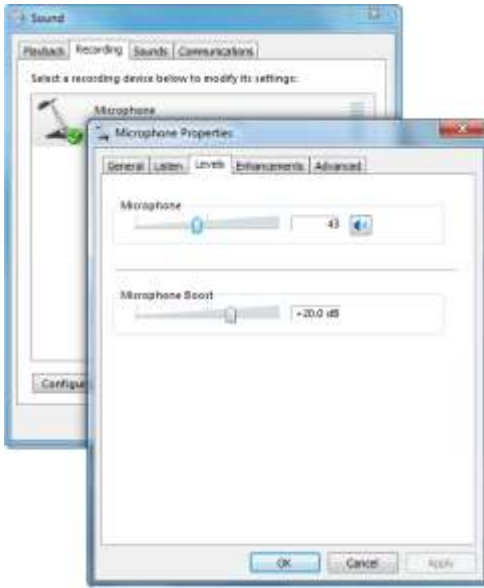
2. The speaker menu is displayed. Click on the recording devices option.



3. The sound properties window and recording tab are displayed. Right-click the microphone option and select properties.



4. From the microphone properties sub menu, select the Levels tab. Use the microphone control to decrease and increase the recording volume. For an additional increase in recording volume, use the microphone boost control.



Microphone boost increases volume and saturation which can decrease overall clarity.

5. Click OK to save the changes to the volumes on the microphone properties menu.
6. Click OK to close the Sound properties window.

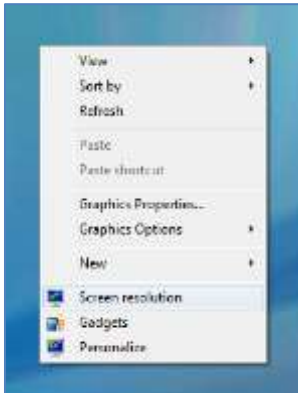


It might be necessary to re-adjust the microphone settings to accommodate environment noise.

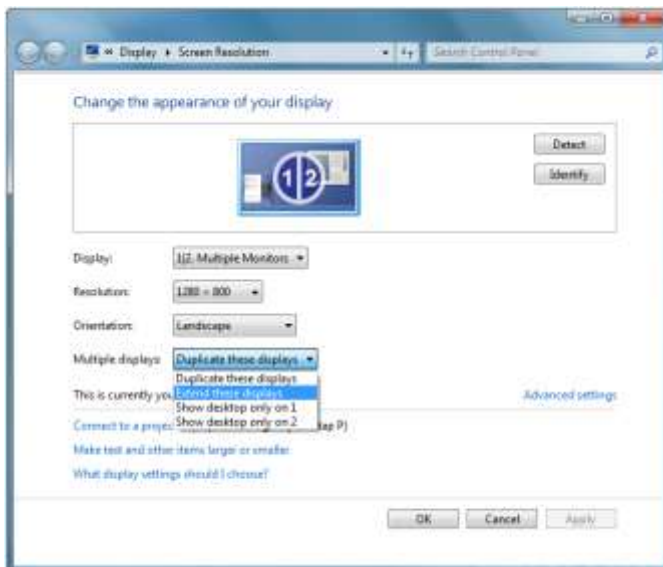
3. Enabling Dual Display

The HAL ALS system uses dual screens to display the GaumardUI and the Vitals monitors. Enable the extended displays using the instructions below. Prior to configuring the extended displays, the monitor must be connected and powered on. Navigate to section II.C.3 to verify the system's setup.

1. Right-click the desktop, then click **Screen resolution**.



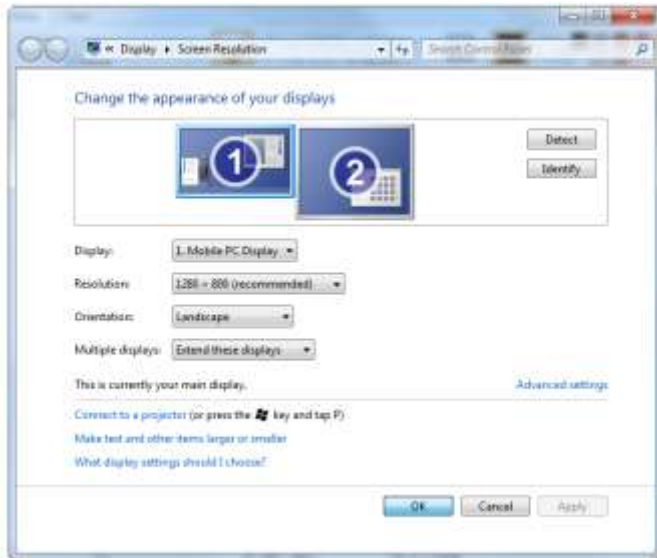
2. From the **Display Properties** window, navigate to the **Multiple displays** drop-down menu. Select **Extend these displays** from the list and click **OK**.



3. The Display Settings window prompts to accept the changes. Click **Keep changes** to continue.



4. The screens diagram will show that both screens are enabled.



5. Click OK to save changes.

D. Warranty

EXCLUSIVE ONE-YEAR LIMITED WARRANTY

Gaumard warrants that if the accompanying Gaumard product proves to be defective in material or workmanship within one year from the date on which the product is shipped from Gaumard to the customer, Gaumard will, at Gaumard's option, repair or replace the Gaumard product.

This limited warranty covers all defects in material and workmanship in the Gaumard product, except:

1. Damage resulting from accident, misuse, abuse, neglect, or unintended use of the Gaumard product;
2. Damage resulting from failure to properly maintain the Gaumard product in accordance with Gaumard product instructions, including failure to properly clean the Gaumard product; and
3. Damage resulting from a repair or attempted repair of the Gaumard product by anyone other than Gaumard or a Gaumard representative.

This one-year limited warranty is the sole and exclusive warranty provided by Gaumard for the accompanying Gaumard product, and Gaumard hereby explicitly disclaims the implied warranties of merchantability, satisfactory quality, and fitness for a particular purpose.

Except for the limited obligations specifically set forth in this one-year limited warranty, Gaumard will not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory regardless of whether Gaumard has been advised of the possibilities of such damages. Some jurisdictions do not allow disclaimers of implied warranties or the exclusion or limitation of consequential damages, so the above disclaimers and exclusions may not apply and the first purchaser may have other legal rights.

This limited warranty applies only to the first purchaser of the product and is not transferable. Any subsequent purchasers or users of the product acquire the product "as is" and this limited warranty does not apply.

This limited warranty applies only to the products manufactured and produced by Gaumard. This limited warranty does not apply to any products provided along with the Gaumard product that are manufactured by third-parties. For example, third-party products such as computers (desktop, laptop, tablet, or handheld) and monitors (standard or touch-screen) are not covered by this limited warranty. Gaumard does not provide any warranty, express or implied, with respect to any third-party products. Defects in third-party products are covered exclusively by the warranty, if any, provided by the third-party.

Any waiver or amendment of this warranty must be in writing and signed by an officer of Gaumard.

In the event of a perceived defect in material or workmanship of the Gaumard product, the first purchaser must:

1. Contact Gaumard and request authorization to return the Gaumard product. Do NOT return the Gaumard product to Gaumard without prior authorization.
2. Upon receiving authorization from Gaumard, send the Gaumard product along with copies of (1) the original bill of sale or receipt and (2) this limited warranty document to Gaumard at 14700 SW 136 Street, Miami, FL, 33196-5691 USA.

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3. If the necessary repairs to the Gaumard product are covered by this limited warranty, then the first purchaser will pay only the incidental expenses associated with the repair, including any shipping, handling, and related costs for sending the product to Gaumard and for sending the product back to the first purchaser. However, if the repairs are not covered by this limited warranty, then the first purchaser will be liable for all repair costs in addition to costs of shipping and handling.

Extended Warranty

In addition to the standard one year of coverage, the following support plans are available:

- Two-Year Extension (covers second and third years)
Call for pricing (USA only)

E. Contact Us

If you have read this user's guide and still require assistance, it's easy to reach us.

E-mail Technical Support: support@gaumard.com
E-mail Sales and Customer Service: sales@gaumard.com

Phone:

Toll-free in the USA: (800) 882-6655
Worldwide: 01 (305) 971-3790

Note: Before contacting Tech Support **you must:**

1. Have the manikin's Serial Number (located in the left leg under the IM site)
2. Be next to the simulator if troubleshooting is needed.

Fax: (305) 667-6085

Post:

Gaumard Scientific
14700 SW 136 Street
Miami, FL 33196-5691
USA

Office hours: Monday-Friday, 8:30am - 4:30pm EST (GMT-5, -4 Summer Time)

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