Premie HAL®

Premature Neonatal Simulator

S3009

Gaumard®
Simulators for Health Care Education

Premie 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 and not intended for clinical decision making.

User Guide 14.5.1

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Contents

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Care and Cautions

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. Additional warnings are found throughout the documentation

If the simulator will not be used for an extended period, re-charge the battery at least once every 60 days to prevent damage.

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

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

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

Premie 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 simulator.

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

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

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

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. Refer to the Consumables and Replacement Parts section of this guide, and contact customer service for more information.

Do not inject fluids into the intramuscular sites. Intramuscular sites are for placement exercises only.

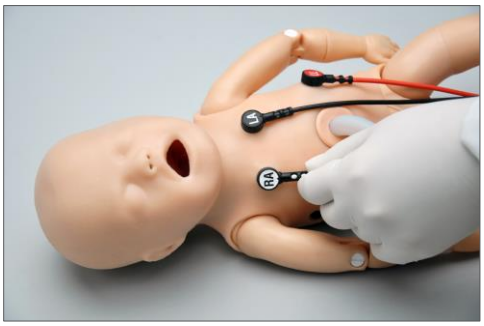
Do not remove or replace the umbilical cord while Premie HAL is in operation. Doing so will cause damage to the system.

Do not pull or carry the simulator by the limbs. Handle Premie HAL with the same care as a human patient.

Conductive Sites

Premie HAL's conductive skin sites allow the attachment of real EKG electrodes. This feature permits the user to track cardiac rhythms with their own equipment just like with a human patient. A few special concerns are described below.

Premie HAL does not accept real electrical therapy. **Do not pace or defibrillate Premie HAL with real electrical equipment.**



The Gaumard User Interface features a virtual electrical therapy function to simulate defibrillation or pacing.

Getting Started

Overview

GENERAL

- Tetherless and fully responsive even while being transported
- Powered from an internal rechargeable battery or wall outlet using power adapter
- Battery capable of 300 recharges and
- Simulator receives commands from a wireless tablet PC and operate at distances up to 150 feet
- Option to operate automatically using Automatic mode or manually by the Instructor
- Training Guide with both basic and advanced interactive scenarios
- Use pre-programmed scenarios, modify them or create your own quickly and easily
- Installation and training worldwide
- Simulation Made Easy ™

AIRWAY

- Oral and nasal intubation
- Use an ET tube or LMA
- Unilateral chest rise with right main stem intubation
- Multiple upper airway sounds synchronized with breathing

APPEARANCE

- Color responds to hypoxic events and interventions (healthy, mild cyanosis, severe cyanosis)

BREATHING

- Control rate and depth of respiration and observe chest rise
- Ventilation is measured and logged
- Select independent left and right lung sounds
- Chest rise and lung sounds are synchronized with selectable breathing patterns
- Accommodates assisted ventilation, including BVM and mechanical support
- Unilateral chest rise

CIRCULATION

- Conductive skin regions allow for ECG monitoring with real equipment
- Multiple heart rhythms, rates and complications
- Heart sounds include a normal heart as well as atrial and ventricular septal defects
- Chest compressions are measured and logged
- Palpable fontanelle, brachial, femoral, and umbilical pulse sites
- Pulse strengths vary with blood pressure and pulses are synchronized with ECG

SIMULATOR

- Internal rechargeable NiMH battery
- Venous access
- Bilateral IV training arms
- Patent umbilicus
- Intraosseous access at tibia

CONTROL

- Wireless tablet PC with stylus control
- Communication modules are FCC and CE Compliant
- Communications module can be used simultaneously with the tablet computer's integrated wireless (IEEE 802.11b) networking device

ACCESSORIES

- 100-240 VAC Charger
- Power supply adapter
- Battery Charger
- Instructions
- Carrying case

OTHER

- One year limited warranty, extended warranty to three years option
- Installation and training services available

Terminology

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

Automatic Mode - In this mode, vital signs respond automatically to caregiver participation, instructor specifications, and pharmacologic intervention. The model used in this operating mode was developed based on physiologic principles. Features unique to this mode include: a comprehensive list of drugs for easy administration, a drug profile editor for adding new drugs or editing existing ones, among other things.

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

GUI - the Gaumard User Interface - is the software application, used to control the simulator and evaluate care providers.

Palette - a collection of Palette Items. Each profile has its own palette.

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

Profile - a unique Premie HAL software 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").

Stylus - a special pointing device for the tablet computer. The stylus is the fastest and easiest means of controlling the Premie HAL software. See the Equipment Set-up section of this guide for more information on working with the stylus.

Equipment Set-up

Control Tablet Computer

The touchscreen tablet computer serves as the simulator's control center. Startup and control commands are sent from the Gaumard control software (UNI) to the simulator wirelessly using the RF communication module shown in the next section.

Please refer to the computer's documentation for important user and safety information before powering on the tablet computer for the first time.

USING THE STYLUS

The stylus operates very much like a mouse. You will notice that the pointer moves when the stylus is held near, but without touching the screen. Tapping the screen with the stylus tip is like clicking the primary (usually left) mouse button. Holding the stylus button while tapping the screen is like clicking the secondary (usually right) mouse button.

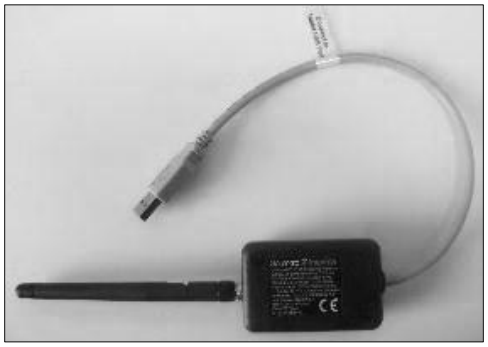
CALIBRATING THE STYLUS

For working with the Gaumard control software and many other applications, the stylus input is far superior to a mouse in both speed and comfort. An additional advantage is it can be easily calibrated for your personal comfort.

The calibration utility found in the control panel will present the user with crosshair targets at each of the four corners of the screen. Position yourself and the tablet as if you are working, and carefully touch the exact center of each of the targets. After calibration, the pointer should be displayed directly beneath the stylus tip. Significant changes to viewing angle should be followed by calibration for best performance.

Communication Module

Connect the RF communication module to an available USB port on the tablet's/PRO+ left side.



Secure the RF communication module to the tablet or PRO+ computer using the Velcro patch.

The tablet is now ready to communicate with simulator.

Warning: Never disconnect the communications module while the

Premie HAL software is running. Doing so can seriously damage the module.

Premie HAL Battery

Premie HAL (S/N p6009067 or higher) includes two separate power adapters labeled “Premie HAL Charger” and “Premie HAL Power Supply”. Before using the simulator for the first time, reference the use for each adapter below.

CHARGING THE BATTERY

To charge the battery, connect the adapter labeled “Premie HAL Charger” to the battery port and charge Premie HAL for 2-3 hours (or until the charger displays a green light). The charger indicator light will show red during the charge period and green once the process is complete.

The simulator’s battery charges only when the control software is disabled.

Avoid using the simulator while the battery charger is connected. If the simulator is in use while the charger is connected, the battery will not charge. To charge the battery you must:

1. If connected, unplug the charger adapter from the simulator and the wall outlet.
2. Turn off the simulator by closing the UNI control software.
3. Re-connect the charger adapter to the wall outlet and the simulator’s battery port.
4. Leave the simulator charging for 2-3 hours with the UNI control software disabled.

BATTERY LIFE

Premie HAL has a maximum battery runtime of approximately 2 hrs. Total runtime is dependent on factors such as breathing rate and sounds.

The battery status is displayed on the software status panel after the connection with the simulator is established. For more information about the battery indicator, refer to “Working with UNI” section.

Warning: If the simulator will not be used for an extended period, re-charge the battery at least once every 60 days to prevent damage to the internal battery.

USING THE POWER SUPPLY (SYSTEM S/N p6009067 OR HIGHER)

The power supply adapter allows the simulator to operate through long simulations sessions by drawing

power from the wall outlet and not battery reserve. Use the power supply for simulation sessions lasting 2 hours or more. If simulation sessions are shorter than 2 hours, use the simulator's battery reserve.

The power supply adapter will NOT re-charge the battery. Avoid using the power supply adapter when the simulator's battery is completely depleted.

To use the power supply adapter:

1. Fully charge the simulator's battery using the "Charger" adapter.
2. Disconnect the "Charger" and connect the "Power Supply" adapter.
3. Activate the UNI software.
4. The UNI battery icon will display a lightning icon when the power supply is connected.

Please contact Gaumard for information on the power supply upgrade for earlier Premie HAL models.

Virtual Monitor

The optional virtual patient vital sign monitor system works with UNI to receive and display the simulator's vital sign information. The system includes an all-in-one touchscreen computer and the Gaumard Virtual Monitor software.

EQUIPMENT SETUP

Please refer to the documentation included with the all-in one computer for important safety, installation, and start-up information. Secure all the system's connection and power on the touchscreen computer as indicated by the product's documentation.

WIRELESS AD-HOC CONNECTIVITY

The tablet and virtual monitor computer automatically establish an **ad-hoc** (computer-to-computer) wireless connection at startup. The wireless connection between both systems allows UNI to update the vital signs information displayed on the Gaumard Monitors program.

To verify the connection between the computers, click on the wireless icon located on the task tray of both the tablet and virtual monitor. For troubleshooting information on the ad-hoc connectivity, navigate to the Appendix.

Gaumard Monitors

After the ad-hoc connection is established, double click or tap the Gaumard Virtual Monitors icon located on the virtual monitor's home screen.

The Gaumard Virtual Monitor software is now ready to receive vital sign information.

To learn more about the Gaumard Monitors features and functionality, click then V menu and select Help to open a digital copy of the Gaumard Virtual Monitor User Guide.

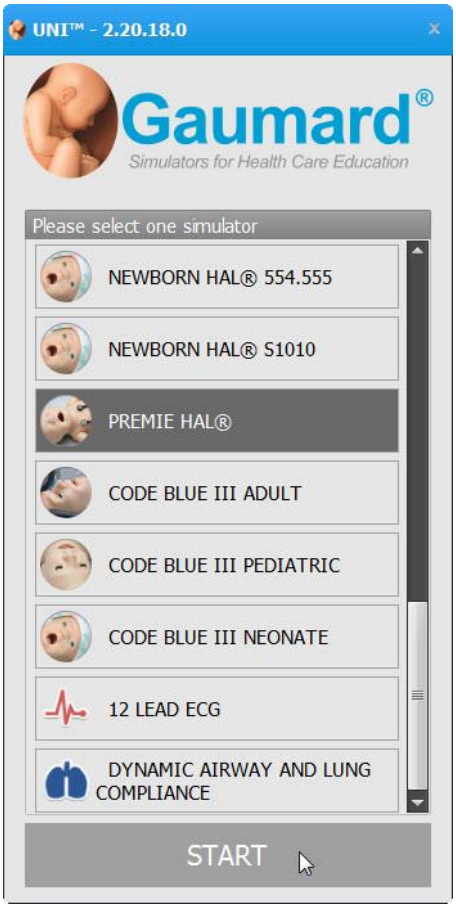
Working with UNI

Initializing the Simulator

After reading the manufacturer's care and caution information, press the power button to turn on the Tablet PC.

The UNI software initializes the simulator. Double click the UNI icon on the tablet's home screen to start.

The simulator selection menu is shown. Select Newborn HAL and click "Start".



The wireless link between UNI and the simulator is established within 1 minute.

PROFILES AND OPERATING MODES

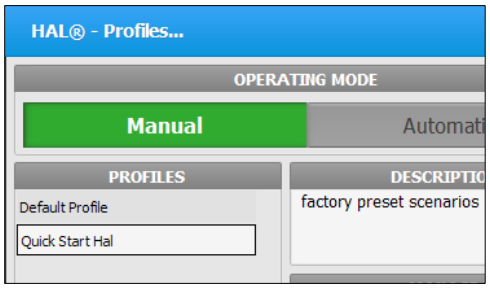
After the startup screen, the profile and operating mode selection menu is displayed.

The UNI control software has two modes of operation: Manual and Automatic. Each mode includes a Quick Start profile with preprogrammed scenarios exercises created in conjunction with experienced healthcare instructors and working medical professionals. Continue to the next section to learn more about the each operating mode and the profiles included.

After selecting an operating mode and profile, click “Load” to continue.

MANUAL MODE

In the “Manual” operating mode, the facilitator fully controls the vital signs and physiologic responses.



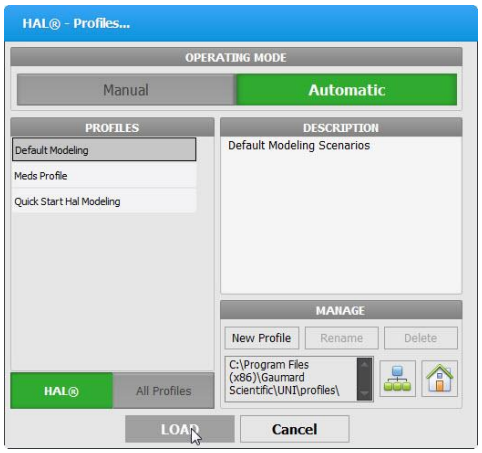
The Manual mode includes the following profiles:

Default Profile – includes one palette with healthy vital signs.

Quick Start Newborn HAL – includes basic preprogrammed scenarios

AUTOMATIC MODE

The Automatic mode assists the facilitator by automatically adjusting vital signs in response to caregiver participation, pharmacologic intervention, and manual input. For example, when facilitator increases the heart rate, the Auto mode will calculate the response and adjust the blood pressure automatically. To activate the operating mode as an upgrade option, go to the digital UNI user guide.



The Automatic mode includes the following built-in profiles:

Default Modeling– includes one palette with healthy vital signs.

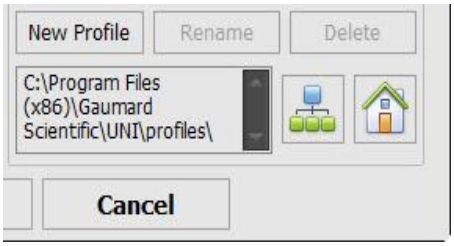
Meds Profile – This profile contains a library of pre-programmed drugs to be used on simulations.

Quick Start Newborn Hal Modeling – includes a library of scenarios configured for the Automatic operating mode

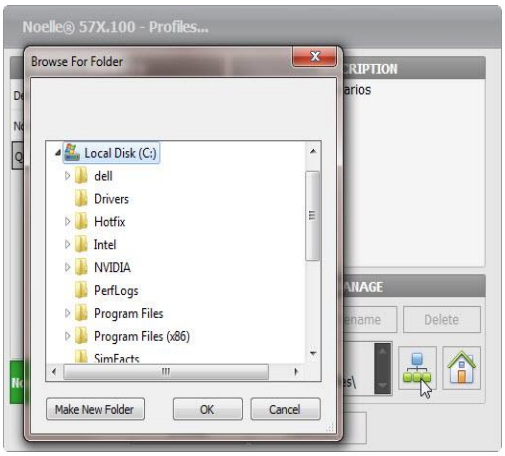
MANAGING PROFILES

Use the Manage Profile Menu to create a new profile and edit this profile.

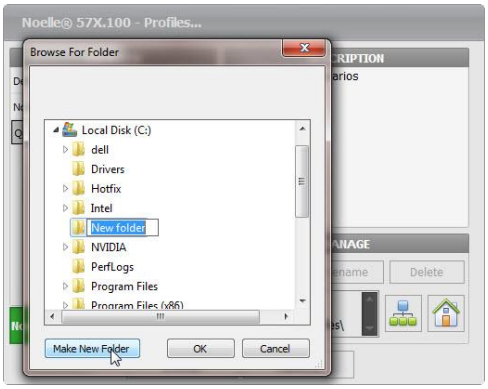
In addition, the profile folder location will be shown below the “New Profile” icon.



Use the “Map Profiles folder“ icon to select the location of the new profile to be created on the server.

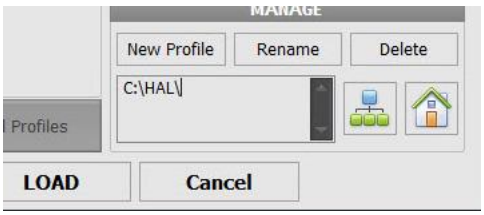


Select the server location and click “Make New Folder” to create the profile folder.



Assign a name to the folder and click “OK”

The new profile folder location will show up. Then proceed to create a new profile, see instructions detailed below.



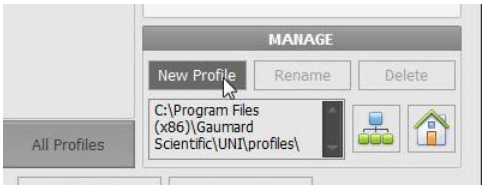
Use the “Home” icon to reset to default profiles folder.

CREATING A NEW PROFILE

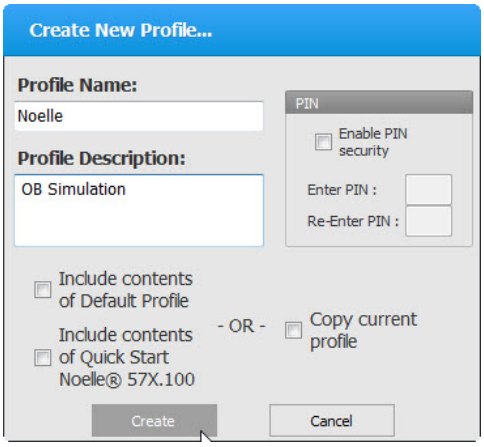
Profiles store palette, scenario, and option settings independently; changes made to one profile have no effect on the others. Below are some examples on how profiles are used.

- Assign one profile to each user of your Gaumard simulator system
- Use profiles to organize and protect palettes and scenarios
- Create a profile dedicated to a specific academic course taught by multiple instructors
- Devote an entire profile to one particular subject area, or even one particular scenario

To create a new profile, click “New Profile”.



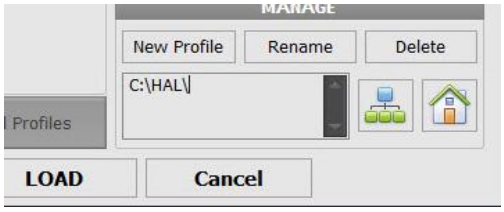
Enter a name for the new profile followed by a description.



Enable the PIN protection to prevent unauthorized users from accessing or making changes to this profile.

Lastly, click “Create” to save the new profile

Click “Rename” or “Delete” to change the name of delete this new profile.

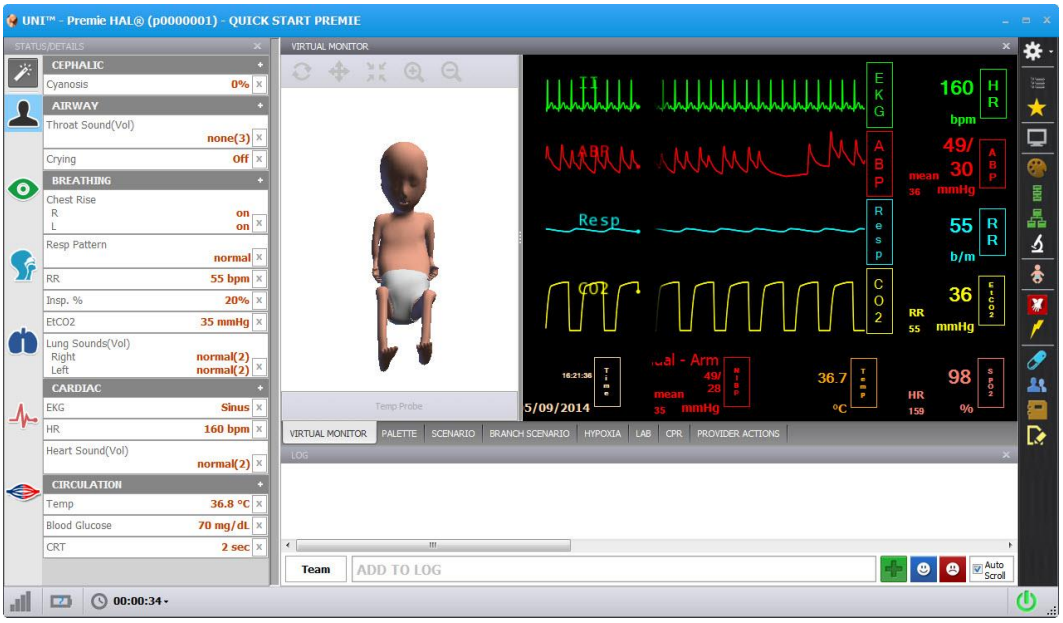


For more information about the UNI software, refer to the digital User Guide under Menu/Help/Instruction Manual.

UNI Interface

The UNI software is used control the simulator, monitor the vital signs, and evaluate the provider's performance. The simulation technician or instructor carrying out the simulation operates the UNI software

The UNI control elements and scenario programming procedures are consistent throughout the Gaumard family of high fidelity simulators. Some software controls and features covered in this guide may be hidden depending on the simulator's hardware configuration and optional upgrades.



CONNECTION STATUS

The communication indicator displays the status of the radio link between the tablet's USB RF module and the simulator. Full bars indicate excellent communication (i.e., normal operation).

BATTERY INDICATOR

The battery indicator displays the battery charge information. An exclamation sign is shown when there is no communication with the simulator and battery information cannot be retrieved.

When the battery icon is depleted, the simulator is set to STAND-BY mode automatically to protect some of the simulator's internal components.

Simulator will not initialize until connected to the charger or the battery is replaced with a fully charged spare.

WARNING

Turn Simulator OFF before replacing the battery. Failure to do so could result in serious damage to the system.

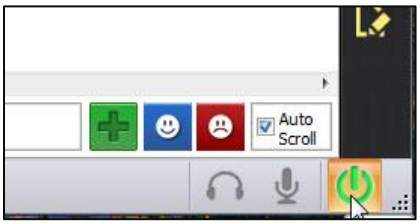
Feature	Runtime
Internal Battery	Approx. 3 hours

SESSION CLOCK

The session timer displays the duration of the current session. Click the timer to reset the clock or to start a new session. Event entries in the text log are synchronized with the session timer.

POWER/STAND BY

The power button is located at the bottom right corner of the UNI software. Toggle the power button to set the simulator to stand-by mode and then again to resume.



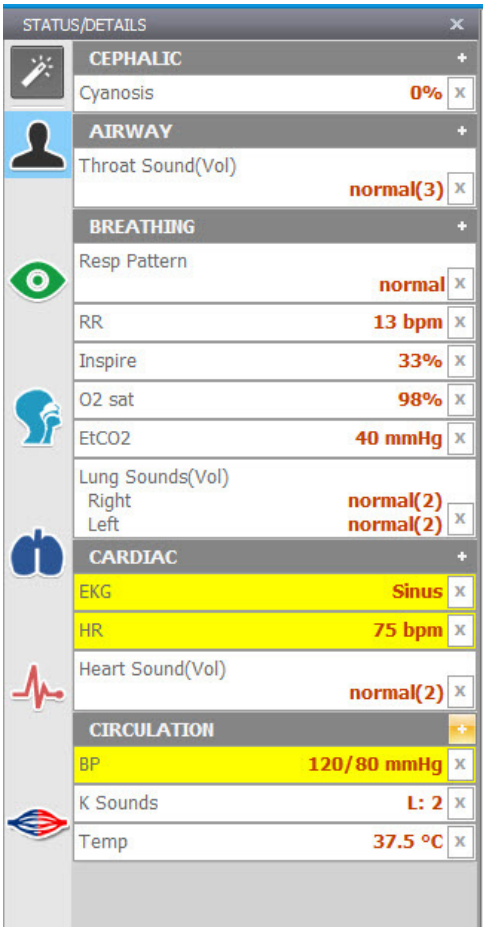
For more information about the UNI software, refer to the digital User Guide under Menu/Help/Instruction Manual.

Status / Details Controls

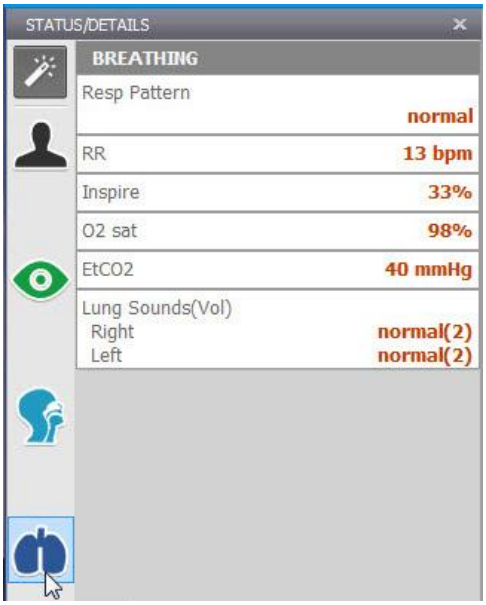
The Status/Details panel is used to monitor and control the simulator's vital signs. The individual parameter controls displayed on the details tab provide the simplest method for controlling the simulator's vital signs, sounds, and features.

The Status/Details tab displays the vital signs controls in a list format.

SYSTEMS LIST VIEW

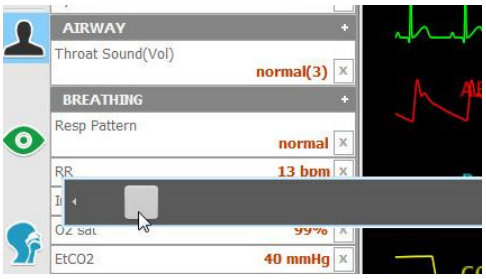


The Status/Details panel is used to monitor and control the simulator's vital signs. The individual parameter controls displayed on the details tab provide the simplest method for controlling the simulator's vital signs, sounds, and features.

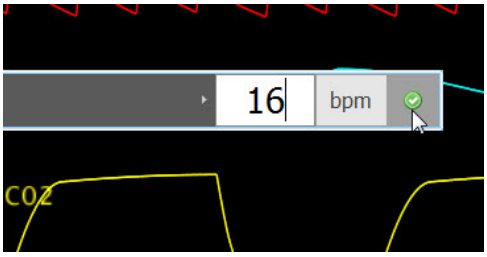


CHANGING VITAL SIGNS

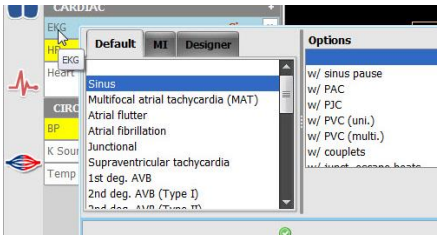
To adjust numerical values click the slider control. (e.g. heart rate, blood pressure, respiratory rate, etc.).

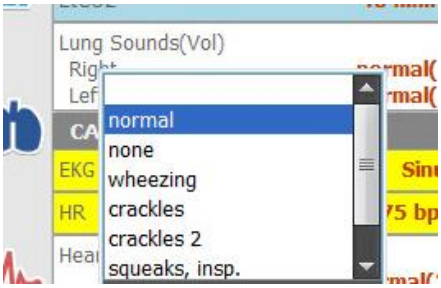


Alternatively, use the keyboard for manual entry and click the green checkmark to confirm the change.

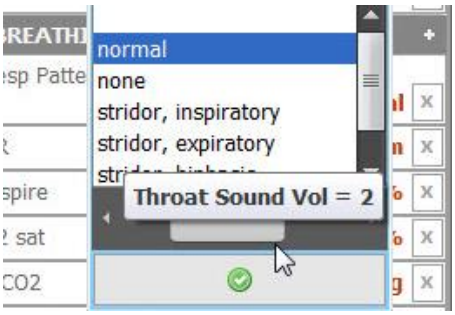


To change patterns, sounds, and rhythms, click on the specific control to display the library (e.g. EKG rhythms, heart and lung sounds, respiratory patterns, etc.)





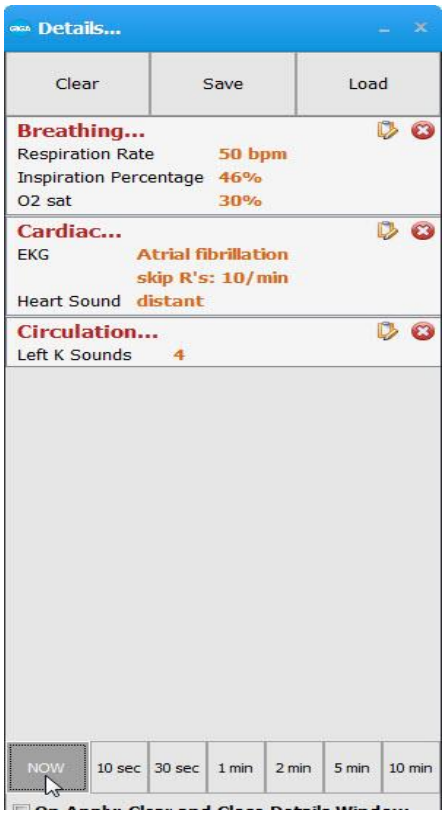
Click the slider control below the sound library to adjust the volume of the sounds.



APPLYING CHANGES

No changes will be made to the simulator's condition until the new settings are submitted using the "Apply" panel.

After the list of changes is created, click "NOW" to update the vital signs instantly. Alternatively, click a trending timer to update numerical vital sign parameters (e.g. heart rate, blood pressure) gradually.



Vital sign parameters can be edited or removed using the edit and remove parameter tabs

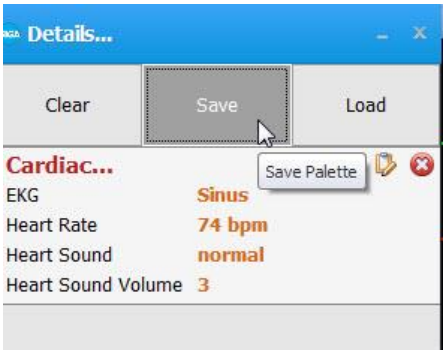
Enable the "instant apply" option and click the control to change the vital

sign to a new value without the need to use “Apply” panel. Vital signs undergoing change blink yellow.

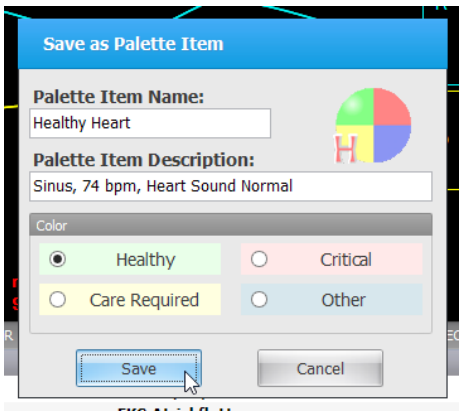
CREATING PALETTE ITEMS

A palette item stores one or more vital sign settings into a single loadable object. Use a palette item to update a set of vital signs quickly. For example, one palette item can be created to update all the cardiac parameters to a healthy state.

To create a new palette item, set the values for the desired vital signs parameters using the details controls and click “Save”.

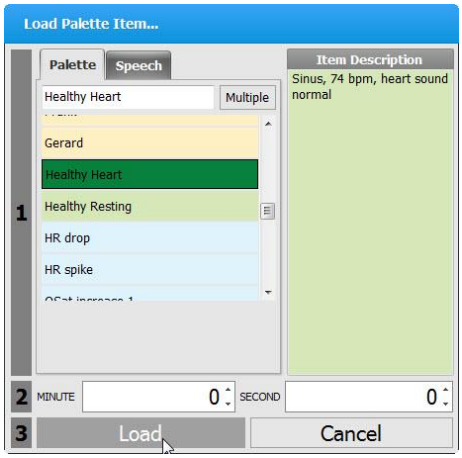


Enter a name for the palette, a description, and choose color code. Click “Save” to create the new palette Item. Palette items are stored in the active profile.

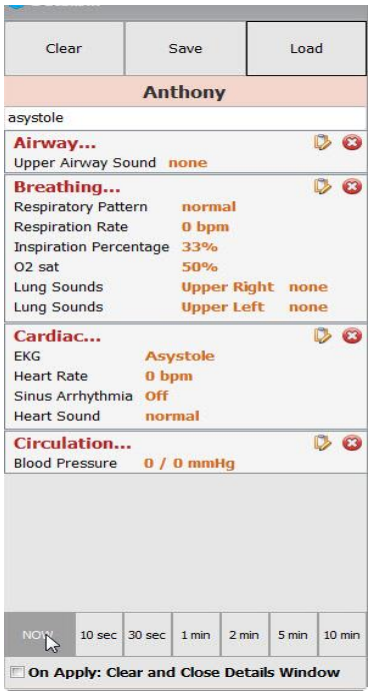


When the palette is needed, click the Load button to select the palette from the library.

Select the palette item from the “Load Palette Item” menu and click “Load”

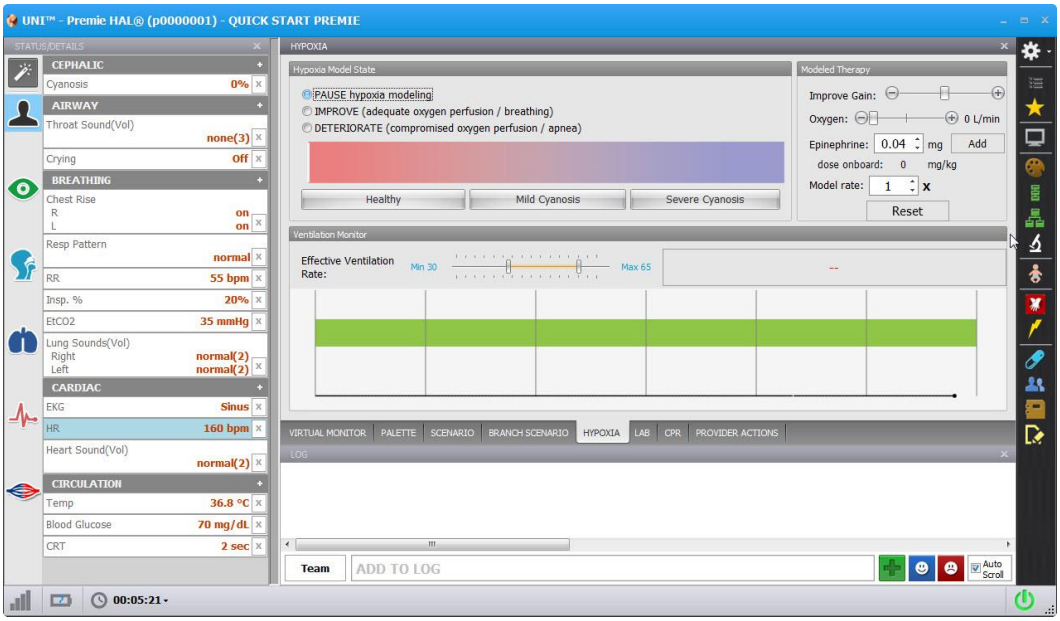


Click the apply option to submit the changes.



Modeling (Newborn/Premie)

Use the Hypoxia tab to evaluate the effectiveness of provider intervention on an apneic patient. The model adjusts the cardiac, oxygen saturation, and cyanosis dynamically in response to effective ventilations. The model also responds to the administration of epinephrine and oxygen.



HYPOXIA MODEL STATE

The hypoxia model options improve or deteriorate the cardiac and respiratory vital signs gradually.

- Pause - Model will pause at the current state.
- Improve - Trend the vital signs to a healthy state.
- Deteriorate - Trend the vital signs to a severe cyanotic state. Ventilations are detected when the respiratory rate is at 0.

CYANOSIS LEVELS

Select the cyanosis level to move to any of the following states immediately:

- Healthy - Pedi is pink with adequate oxygenation.
- Mild Cyanosis - Pedi is slightly blue, and the vital signs are starting to deteriorate.
- Severe Cyanosis - Pedi is blue, apneic, and vital signs are rapidly worsening.

MODELED THERAPY

The modeled therapy menu provides additional intervention options.

- Improve Gain - Adjust the slider to increase or decrease the cyanotic response to ventilations.
- Oxygen - Adjust the slider to administer oxygen to the fetus in liters per minute.
- Epinephrine - Administer epinephrine to the model. Set the epinephrine dose and then click “add”. Administering epinephrine increases the heart rate.
- Reset - Click “Reset” to clear the oxygen flow and the epinephrine dose onboard.

Working with Premie HAL

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

Category	Simulator Feature		
Airway	Nasal Intubation		
	Oral Intubation		
	Breathing/Airway Sounds		
	Suction exercises		
Breathing	Automatic Chest Rise		Independent chest rise
	Lung Sounds		
Cardiac	Heart Sounds		
	ECG generated in real time		4 patches
	Chest compressions sensor		
Circulation	Bilateral IV		
	Pulses		Fontanel, Brachial, Umbilical, Femoral
	Cyanosis		
Systemic	Pedal Vein (left)		
	Frog legs position		
	Intraosseous access		
	Temperature sensor		
Other	Physiologic Model	Optional	
	ETC Pro+	Optional	Audio/Video recording and debriefing
	Gaumard Virtual Monitor	Optional	

Airway

ORAL AND NASAL INTUBATION

Premie HAL's airway can be intubated orally using LMA or endotracheal tubes. Intubate nasally using a nasogastric tube for placement exercises.

Procedure	Recommended Device Size
Intubation (Blade size)	Miller 0
LMA	Size 1
Nasal Intubation	8 Fr catheter
Oral Intubation	ETT 2.5 no cuff, 6 Fr suction catheter

Warning: Always lubricate tubing, airway, and nasal opening prior to performing any nasal or oral intubation. Failure to do so will make intubation very difficult and is likely to result in damage.

Do not insert liquids or spray silicone oil into the mouth and airway.

AIRWAY SOUNDS

Use the Detail tab parameter controls to change the upper airway sounds on the simulator.

SUCTION

Simulate suction technique.

Breathing

RESPIRATORY PATTERN

Use the Detail tab parameter controls to change the simulator's respiratory pattern.

LUNG SOUNDS

Use the Detail tab parameter controls to change the audible respiratory sounds on the simulator.

BILATERAL CHEST RISE

Set the respiratory rate higher than zero to enable automatic bilateral chest rise and fall.

Disable the right or left lung individually.

PULMONARY VENTILATION

Ventilate the simulator using a bag valve mask or a mechanical ventilator. Set the respiratory rate to "0" to display chest rise during ventilation and receive feedback on the CPR window.

Cardiac

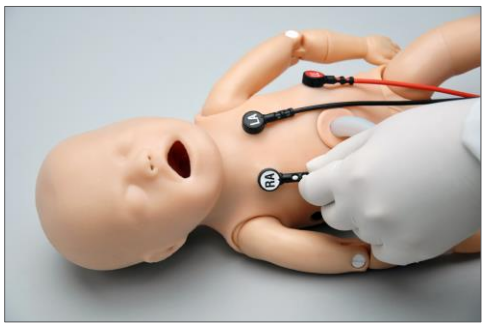
HEART SOUNDS

Use the Detail tab parameter controls to change the audible heart tones on the simulator.

Heart sounds are synchronized with the heart rate and selectable cardiac rhythms.

ECG MONITORING AND ELECTRICAL THERAPY

Conductive skin sites allow the attachment of real EKG electrodes. This feature permits the provider to track cardiac rhythms with real medical equipment just like with a human patient.



Use the virtual shock panel to simulate the administration of electrical therapy via software. To enable the virtual shock panel feature, go to the digital UNI User Guide under software Menu/Help/Instructional Manual.

Warning: Do not physically pace or defibrillate Premie HAL with real medical equipment. Doing so will damage the electrical components.

CHEST COMPRESSIONS

From the CPR trainer window, monitor the cadence and force of chest compressions applied by the provider. For more information on the CPR trainer, go to digital UNI User Guide under Menu/Help/Instruction Manual.

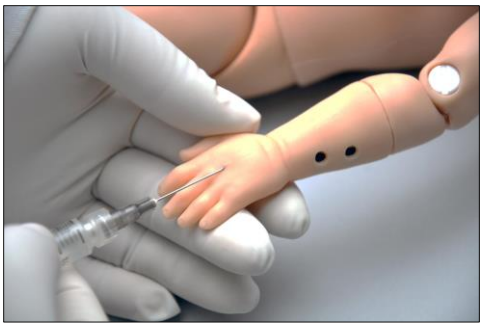
Circulation

PALPABLE PULSES

Palpable pulses (fontanel, brachial, umbilical, and femoral) are dependent on blood pressure.

INTRAVENOUS ACCESS

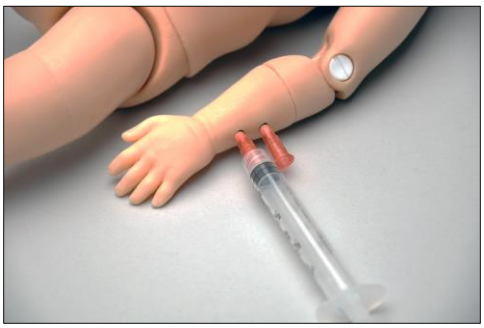
Bilateral IV training arms allow for intravenous infusions as well as drawing fluids. Use a flashlight to detect veins in the dorsum of the hand.



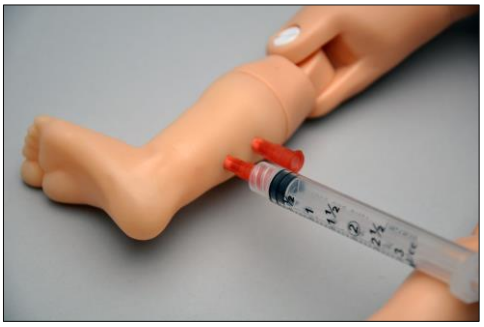
Warning: Use only Gaumard's provided simulated blood. Any other simulated blood brand containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

Follow the steps below to fill the IV vasculature for drawing fluids.

1. Fill the modified syringe with water or diluted Gaumard simulated blood.
2. Connect the syringe into the fill port and the drain connector to the drain port as shown.



3. Slowly push the fluid into the IV circuit until it begins to flow out of the drain connector.
4. Remove the fill syringe and drain connector. The self-sealing ports will keep the fluid inside the veins.
5. Repeat the procedure to fill the IV vasculature on the lower leg. Use a flashlight to detect veins.



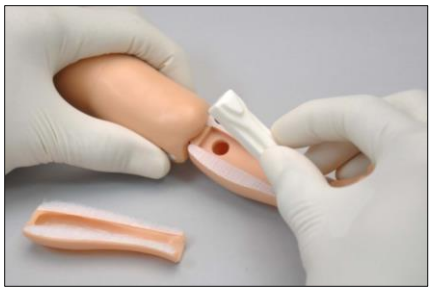
For simulation of high volume infusions, it is necessary to leave the drain tube attached and run it to a suitable outlet or container.

INTRAOSSEOUS ACCESS

Establish intraosseous infusions access to administer fluids and medications. To use this feature, follow these simple steps:

1. Remove the skin from the leg to access tibia bone insert.

2. Lift the tibia insert out of the holder.

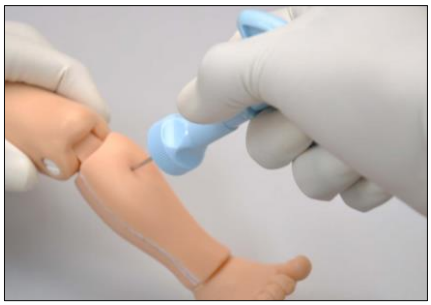


3. Hold the tibia bone vertically and inject 2cc of fluid through the rubber stopper. Air and excess fluid are purged through the vent port near the top of the bone.

4. Insert the fluid filled bone back into the holder.

5. Replace the skin and palpate tibial tuberosity.

6. Insert the IO device into the tibia bone to perform an exercise. Notice the decrease in needle resistance as it passes into the bone marrow cavity. Remove stylet, aspirate bone marrow, and infuse fluids.

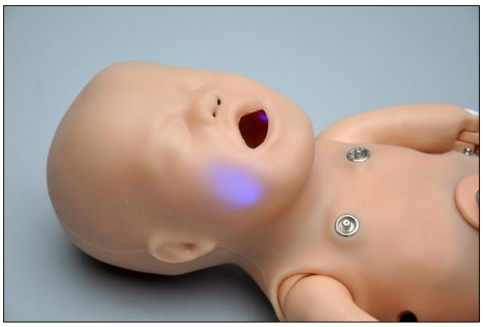


Following the procedures, aspirate infused fluids using an empty syringe through the rubber stoppers. To extend the life of each bone insert, seal puncture marks with cement glue and leave to dry before re-inserting them into the holder.

Systemic

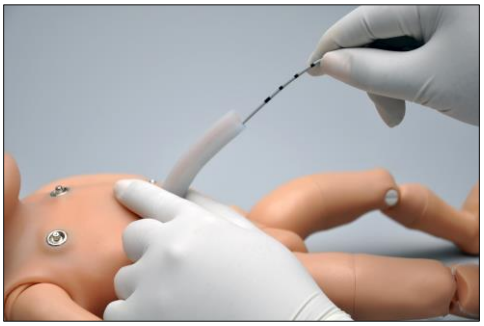
CYANOSIS

Control and program the visible cyanosis on the simulator. Use the Model tab to automate the change in cyanosis as the provider performs CPR intervention. For more information on the Model feature, go to “Modeling” section.



CATHETERIZATION

Catheterize or inject the umbilical cord. To fill the umbilical cord with fluid, inject any of the three blood vessels with 2 mL of water using the syringe. For catheterization exercises, use a 6 Fr urethral round tip catheter lubricated with silicon oil.



The replaceable umbilical cord can be trimmed or cut. Before removing or replacing the umbilical cord after an exercise, turn off the simulator by exiting the software (File>Exit), or set the simulator on STAND-BY mode. After the simulator is powered down, the umbilical cord can be safely unplugged. For information about ordering replacement umbilical cords, go to the Appendix.

Warning: Do not remove umbilical cord while Premie HAL® is in operation. To remove the umbilical cord, first turn the simulator off (by clicking on File, Exit on the UNI software), or set the manikin on STAND-BY mode. Replacement of cords should also be done while the manikin is turned off or set on STAND-BY mode.

TEMPERATURE PROBE

The temperature reading on the vital signs monitor is displayed when a temperature probe is placed on the lower right quadrant of the abdominal area.

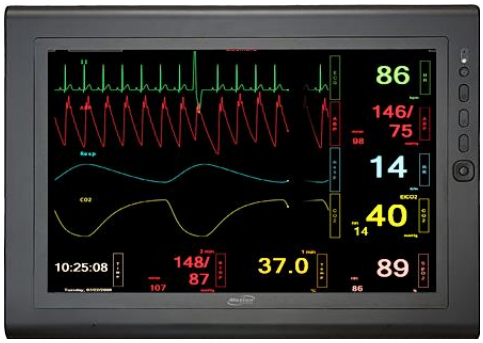
To enable the temperature sensor detection feature, go to Setup>Options>Neonate features Tab. Checkmark “Use temp. sensor” and click OK to save. The log panel detects the placement of the sensor.

Other

VITAL SIGNS MONITOR (OPTION)

The Gaumard Monitors touchscreen display simulates the functionality of a patient vital signs monitor. Users can customize the type of waveforms and scalars displayed, set alarms, and display lab reports, x-rays, and other files for the provider to access during simulation.

The Gaumard Monitors vital signs system is available in a mobile and desktop solution.



For information on how to setup Gaumard Monitors with GUI, please refer to the help File included with the Gaumard Monitors software.

PRO + (OPTION)

The Pro+ system is an all-in-one session recording and simulator control solution for facilitators in a lab or mobile environment. The built in UNI software allows the facilitator to control Premie HAL while recording care provider interaction and event logs. The upgrade replaces the standard tablet with a convertible touchscreen laptop loaded with the Pro+ environment and UNI, (2) WIFI enabled cameras, (1) motorized 180 view USB camera and carrying case.

For more information on using the Pro + system, refer to the documentation included with the upgrade option.

Appendix

More about Scenarios

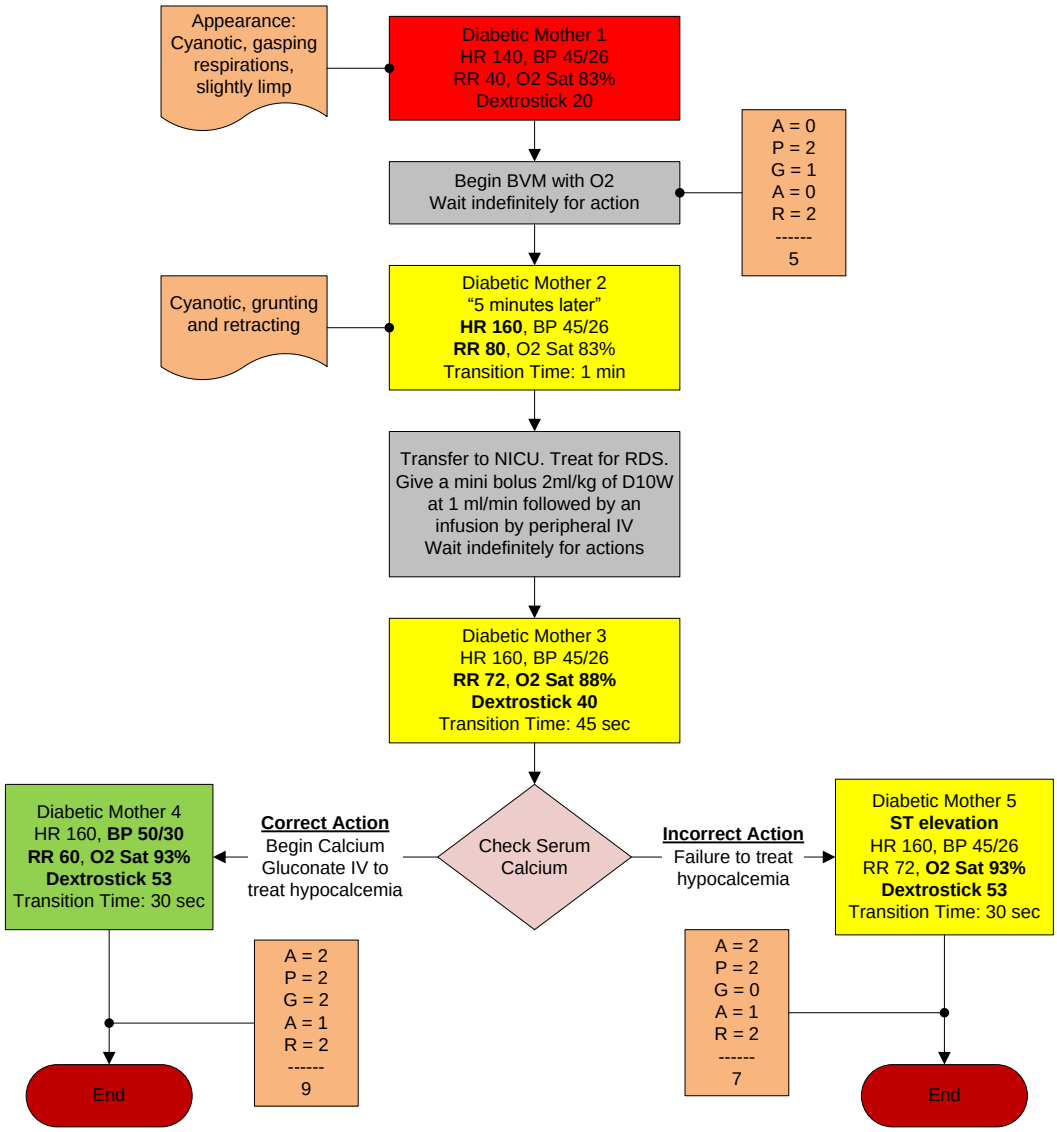
Factory Preset Scenarios

	Scenario Title	Name	Scenario Type	Operating mode
1	Diabetic Mother	Diabetic Mother	Branching	Manual
2	Ductal Dependant Heart Lesion	HLHS	Linear	Manual
3	Group B Sepsis and Secondary Apnea	Group B Sepsis	Branching	Manual
4	Hyaline Membrane Disease	HMD	Linear	Manual
5	Meconium Aspiration and Pneumonia	Meconium Aspiration	Branching	Manual
6	Necrotizing Enterocolitis	NEC	Branching	Manual
7	Normal	Normal	Branching	Manual
8	Patent Ductus Arteriosus	PDA	Branching	Manual
9	Pneumothorax	Pneumothorax	Linear	Manual
		Meds Profile		
1	Adenosine OD	Adenosine OD	Linear	Automatic
2	Adenosine SD	Adenosine SD	Linear	Automatic
3	Adenosine UD	Adenosine UD	Linear	Automatic

Premie HAL®

Diabetic Mother

A thirty two week infant is born to a 23 year old insulin dependant mother who was diagnosed at age 21. She is classified as Type B and has been followed in the high risk clinic. Suction and stimulation have already been applied.

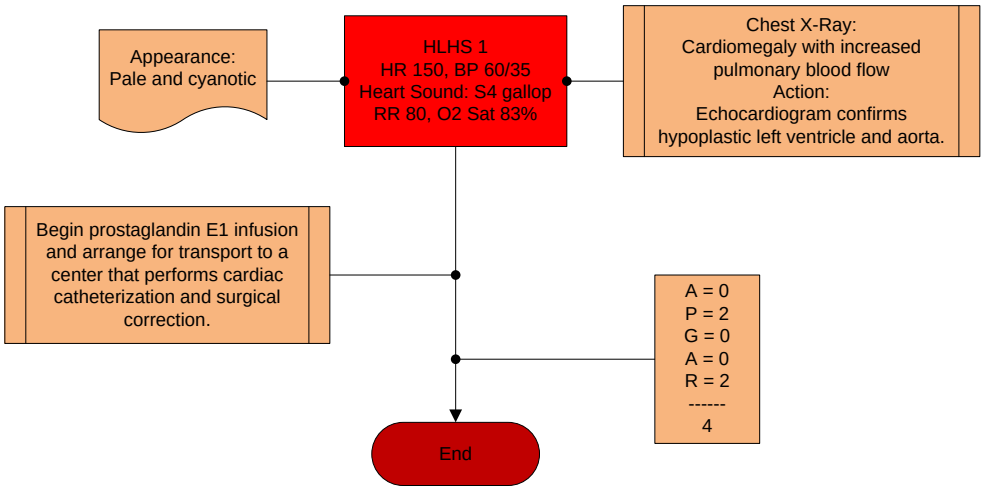


Premie HAL®

Ductal Dependant Heart Lesion

Hypoplastic Left Heart Syndrome

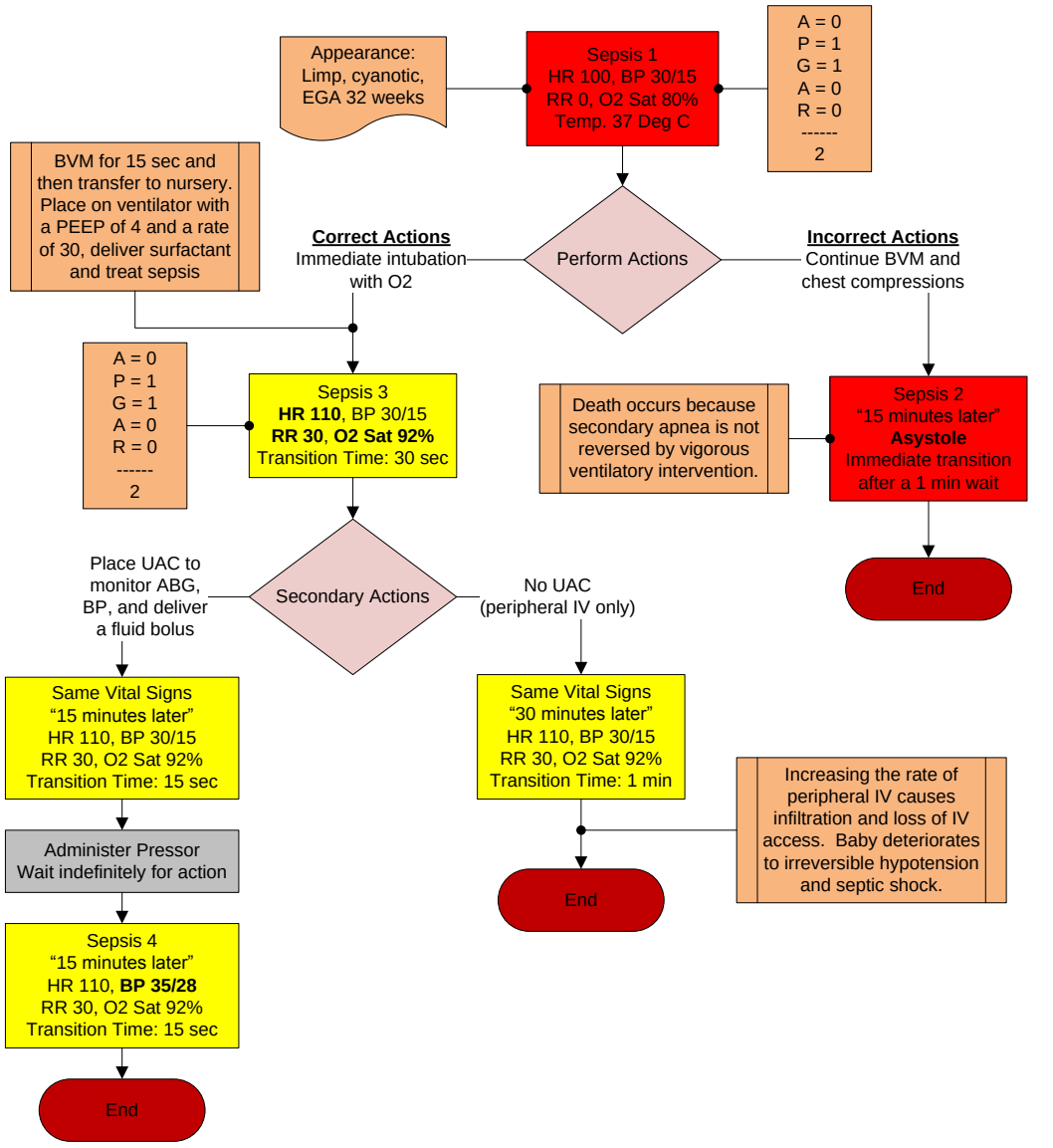
A 32 week premie remains cyanotic despite breathing 100% Oxygen



Premie HAL®

Group B Sepsis and Secondary Apnea

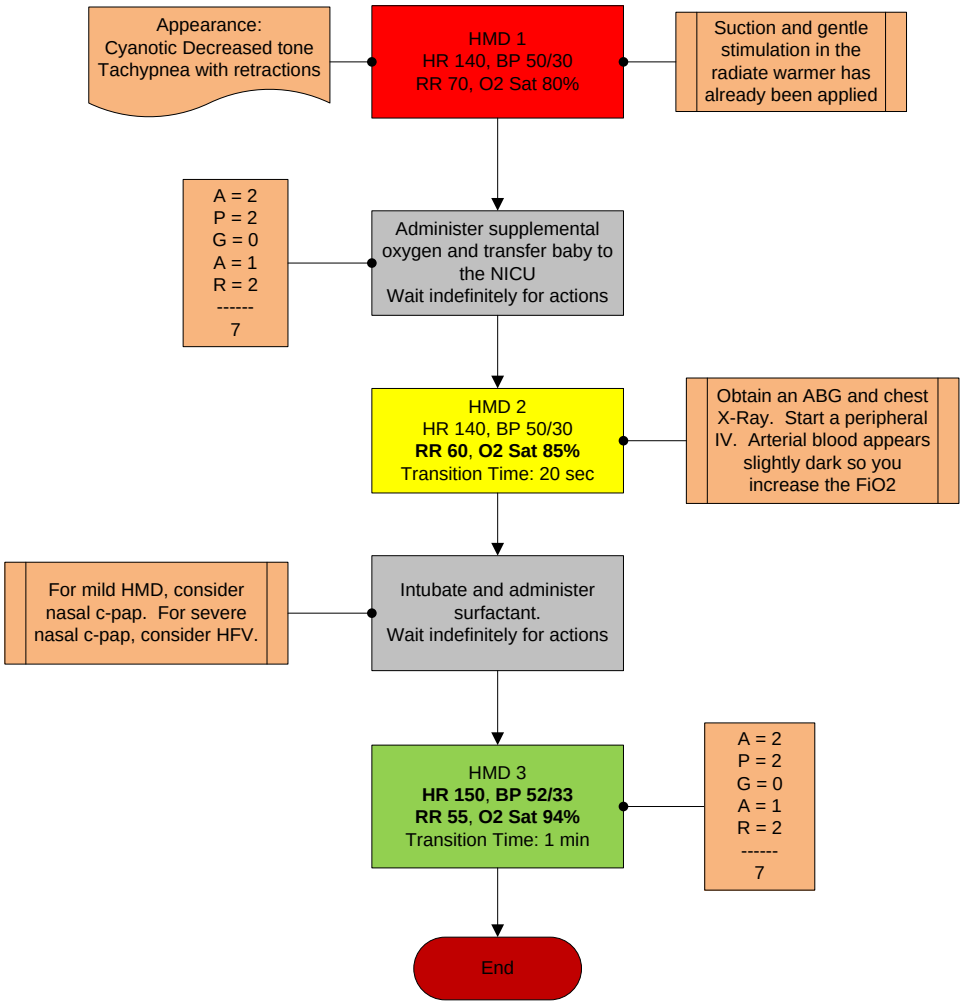
A mother with no prenatal care delivers a premature baby with foul smelling amniotic fluid in the emergency room. The baby is being bagged with O2.



Premie HAL®

Hyaline Membrane Disease

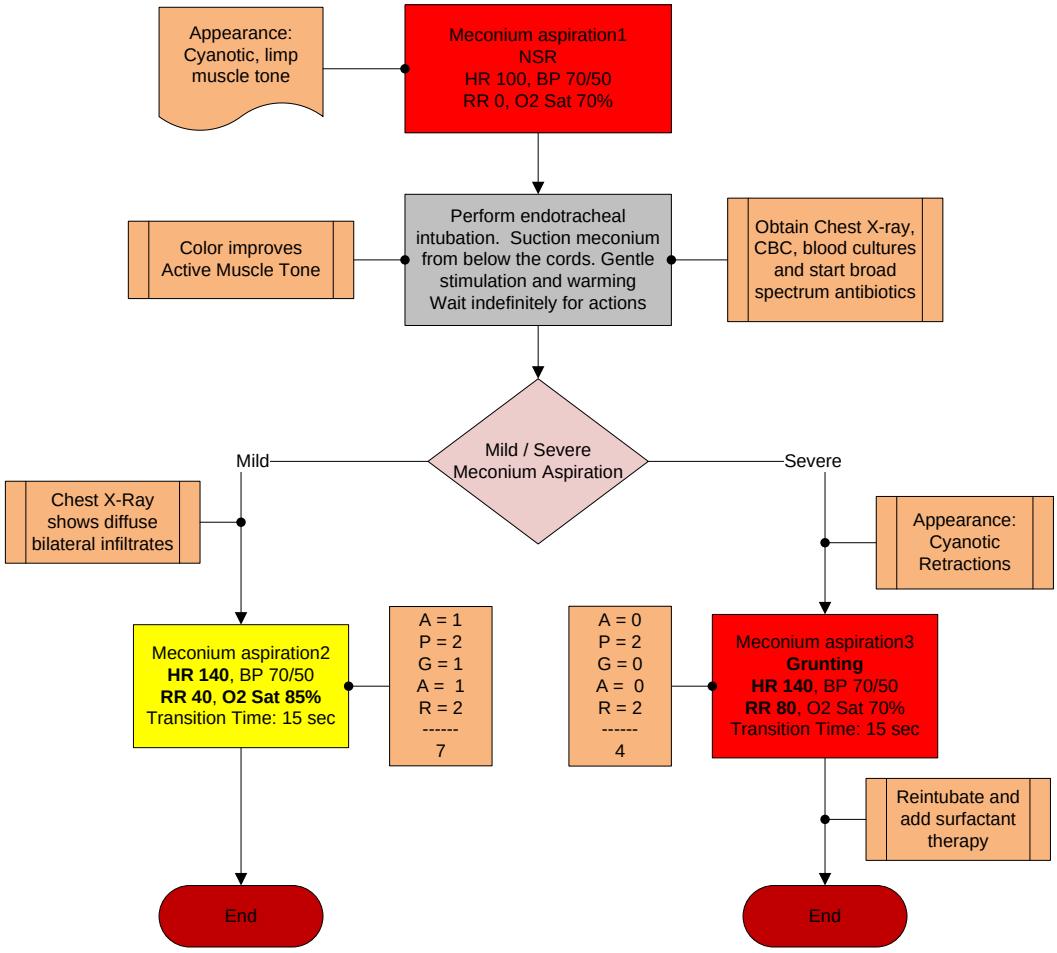
A teenage mother with no prenatal care delivers a 1300g Infant in L/D



Premie HAL®

Meconium Aspiration and Pneumonia

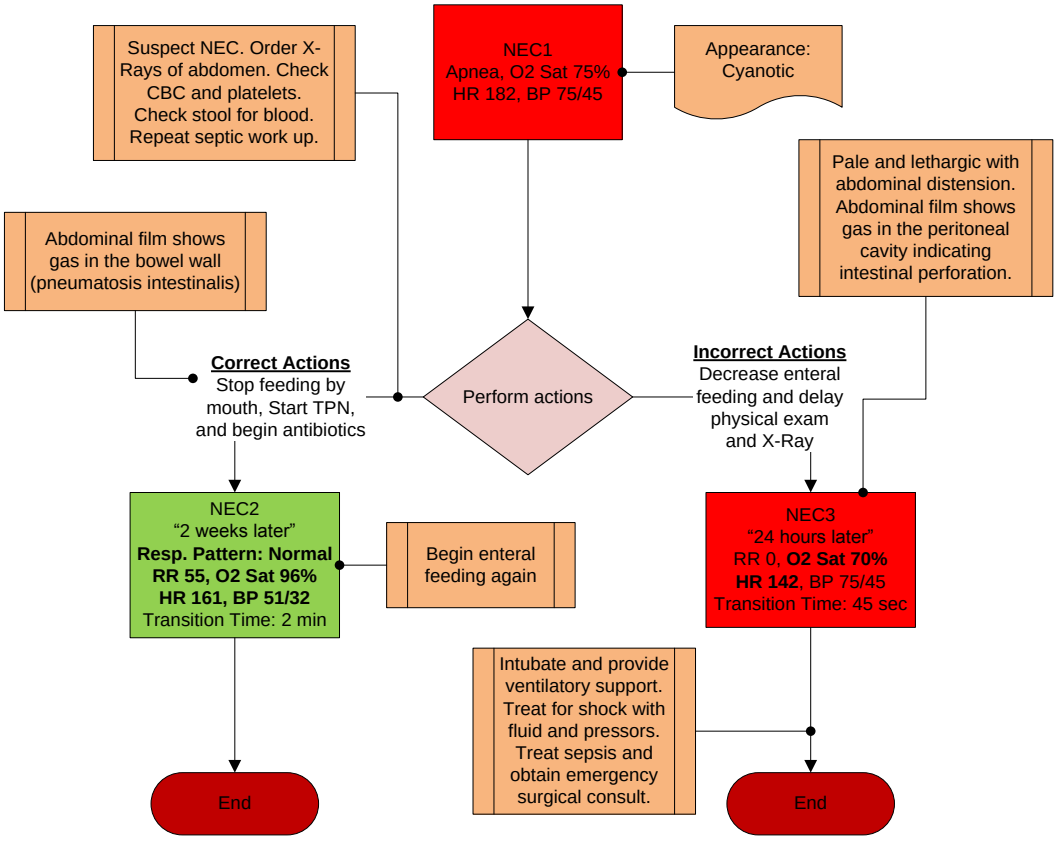
A thirty one week infant is delivered with thick meconium stained amniotic fluid.



Premie HAL®

Necrotizing Enterocolitis

A two week old premature infant began enteral feeds a week ago. He required some resuscitation at birth for perinatal asphyxia and received antibiotics for possible sepsis. His nurse reports increasing gastric residuals and a few episodes of apnea and increasing abdominal girths.

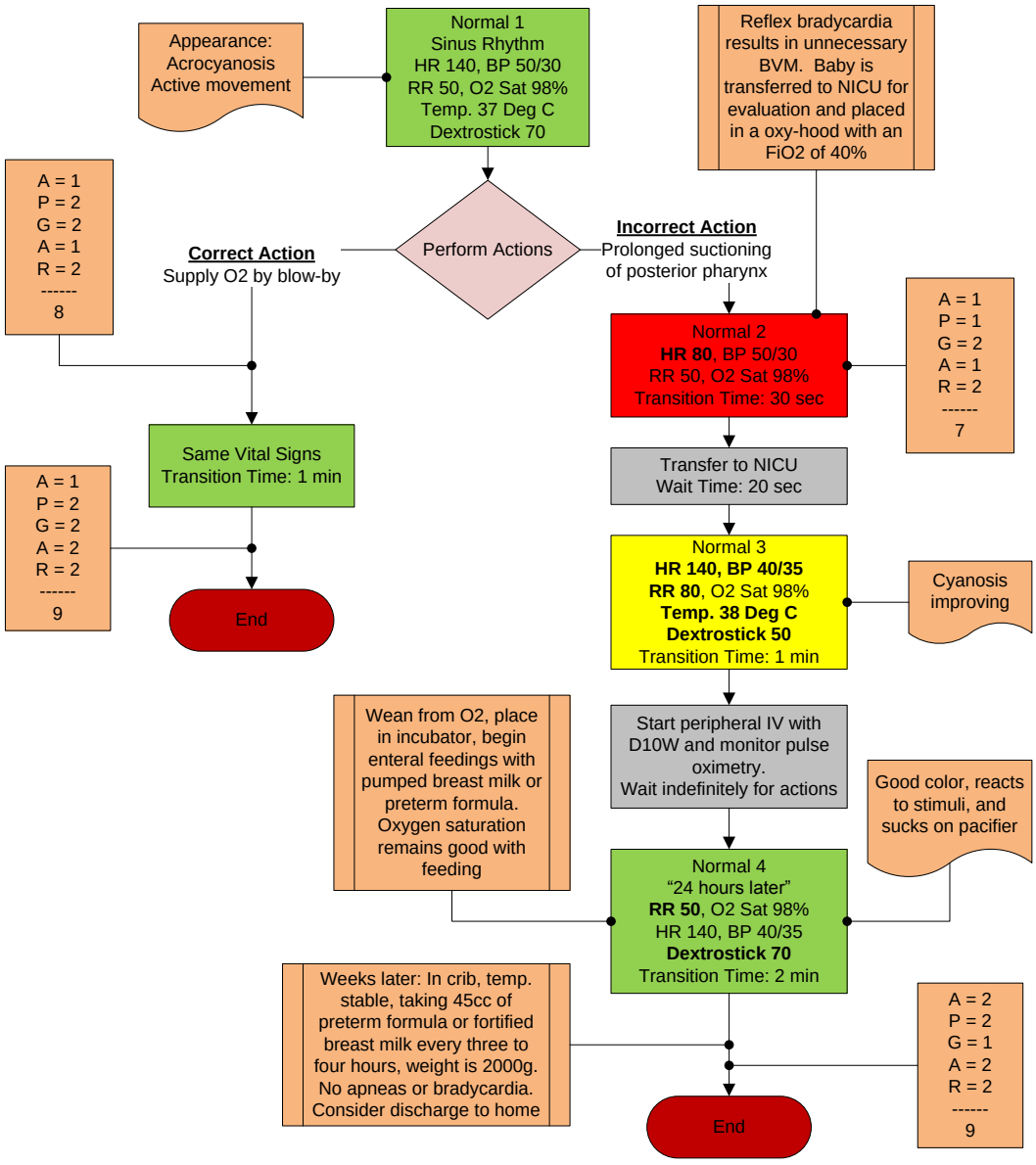


Gaumard®
Simulators for Health Care Education

Premie HAL®

Normal

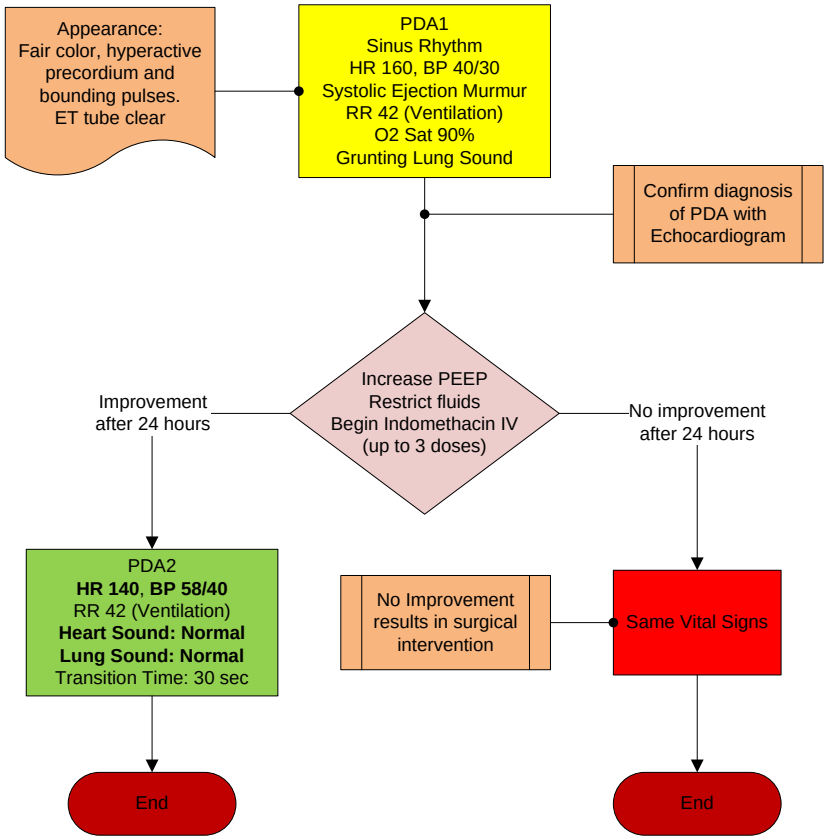
A mother is admitted to the hospital for preterm labor. She has had good prenatal care and her dates show the infant to be approximately 32 weeks. She received two doses of antenatal steroids, her membranes are intact and the baby's Lecithin/Sphingomyelin (L/S) ratio is 1.9:1. She continues to labor and the baby's scalp pH is 7.5. Despite attempts to delay delivery she delivers a 1300g infant. After suctioning and gentle stimulation, the baby begins to cry.



Premie HAL®

Patent Ductus Arteriosus

On the second day of life, a premie who has had a good response to surfactant and ventilation develops deteriorating vital signs.

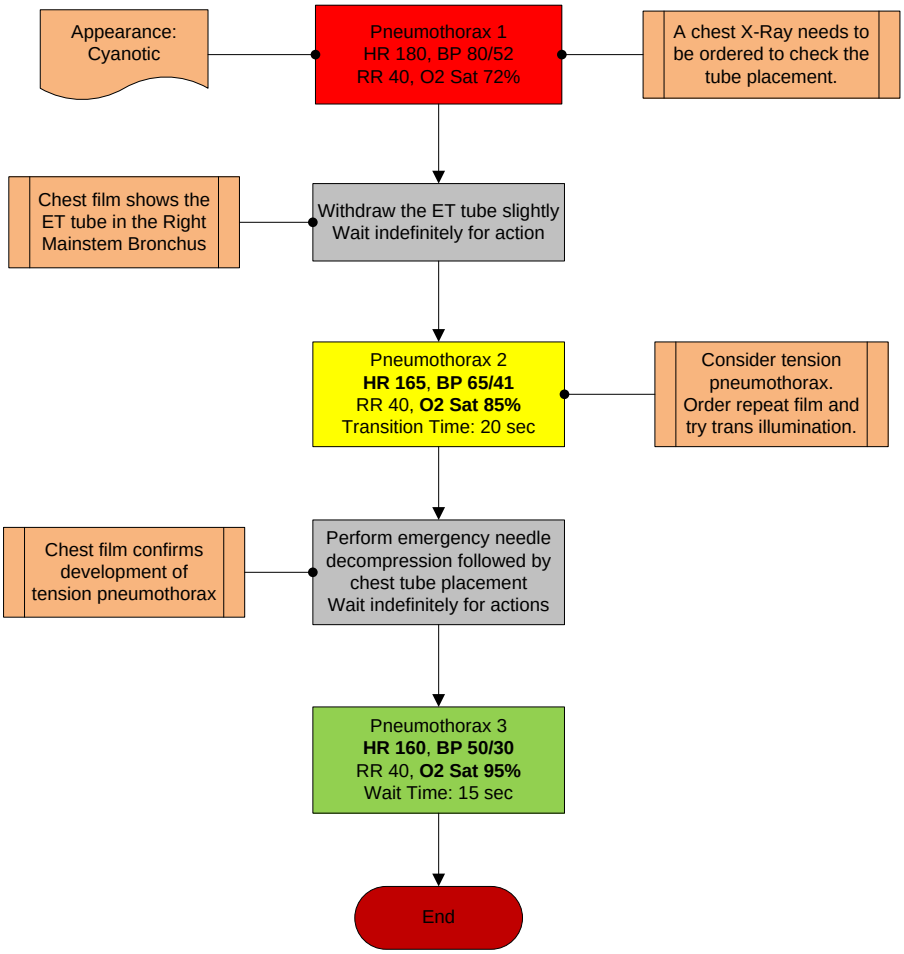


Gaumard®
Simulators for Health Care Education

Premie HAL®

Pneumothorax

This 32 week infant had no respiratory effort at birth and required intubation is now on a ventilator with a setting of 40 The mother had good prenatal care and received two doses of antenatal steroids prior to delivery.



More about 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. 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 therefore be applied to a wide range of scenarios. The key is to include only 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 available setting on the Status/Details panel. Remember that only the settings you specify will cause a change in the simulator, and all other settings will remain constant. Therefore, by starting with a complete state, the simulator’s condition will always be the same when the scenario starts, regardless of what she 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 UNIis 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 do not, 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 a scenario should be created with the assumption that the providers will perform correctly. As long as they do, the scenario can be allowed to continue.

Naturally, preparation must be made for what might happen to the simulator 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 Status/Details panel.

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

As 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

Troubleshooting

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)**	Battery is discharged	Turn off the software and plug "charger" adapter to the simulator. The charger's LED will turn green when the simulator is completely charged. Do not turn on the UNI software until the charging process is complete. The adapter labeled "Power Supply" does not recharge the battery. Disconnect the "Power Supply" and follow the charging procedure explained above.
	Computer is too far away from simulator	Get simulator closer to computer.
	RF module is not connected	Close the UNI software and connect the USB RF module to the tablet computer.
	Trying to communicate with a different simulator	After clicking the UNI icon, select the name of the applicable simulator and click "Start". On the menu bar go to Setup> Options> Environment and select FIXED. Then, enter the simulator's serial number in the text box. Finally, restart the software.
	Multiple simulators are on at the same time.	Select different channels for each of the simulators, and then turn them on one at a time, meaning: Wait until a link has been established between the tablet and

Symptom	Possible Cause	Solution
		the simulator (the yellow window goes away). Only after that, start running the UNI software in the second tablet, and so on for the rest of the simulators. To do so, go to menu Setup → Options → Environment → Select "Auto change to channel: #" (# = number from 1 – 11).
	All others	Close the UNI software and unplug the RF module for at least 5 seconds, then plug it back in. Restart the software and wait for initialization. On the menu bar go to Setup>Options>Environment and select FIXED. Then, enter the simulator's serial number in the text box. Finally, restart the software.
Simulator doesn't run for the time specified on the manual	Battery not charged, charger requires reset	Turn off the software and unplug "charger" adapter from the wall and the simulator for 1 minute. Reconnect the "charger" to the wall and the simulator. Unplug the charger when the charger's LED turns green indicating that the simulator is completely charged. Do not turn on the UNI software until the charging process is complete.
Simulator doesn't respond to any command even that blinking communication indicator is consistently green	The computer is properly communicating with a different simulator.	On the menu bar go to Setup> Options> Environment and select FIXED. Then, enter the simulator's serial number in the text box. Finally, restart the software.

Symptom	Possible Cause	Solution
Commands are taking longer than usual to take effect or simulator is not reporting every action (blinking communication indicator is consistently yellow)	Distance between computer and simulator is reaching its limit or there are too many obstructions between (walls, etc)	Get simulator closer to computer or move away from obstructions
	There's too much RF interference either from another Gaumard tetherless simulator in the vicinity or an RF radiator.	Try changing the RF channel by going to the menu for Setup → Options → Environment → Select "Auto change to channel: #" (# = number from 1 – 11).
UNI has set the power mode to STAND-BY automatically	The battery on the simulator is depleted	Turn off the software and plug "charger" adapter to the simulator. The charger's LED will turn green when the simulator is completely charged. Do not turn on the UNI software until the charging process is complete. The adapter labeled "Power Supply" does not recharge the battery.
"RF module not found" message is displayed when UNI is started	RF module not connected	Connect the RF module to any USB port.
	RF module not identified by the computer	Close the software and disconnect the RF module for at least five seconds, then plug it back in and restart the software
Chest compressions are not properly detected or not	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "blinking communication indicator is consistently yellow"

Symptom	Possible Cause	Solution
detected at all	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 “Status/Detail” panel on the UNI 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 than “0”. Try changing the respiration rate to a different value, and if still nothing happens, try turning the restart the simulator.
Pre-built		Select “Quick Start Scenarios”

Symptom	Possible Cause	Solution
scenarios don't show up		when starting the software. 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"
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.

Wireless Network

UNI generates the vital signs information displayed on the virtual monitor PC. The information is transmitted through a wireless ad-hoc connection between the two computers in real time.

The wireless settings are configured at the factory, so no additional configuration is required.

Use the “Create an ad-hoc Wireless network” tool to configure the wireless ad-hoc link between the two computers. Then, configure the connection between UNI and the Gaumard Monitors software.

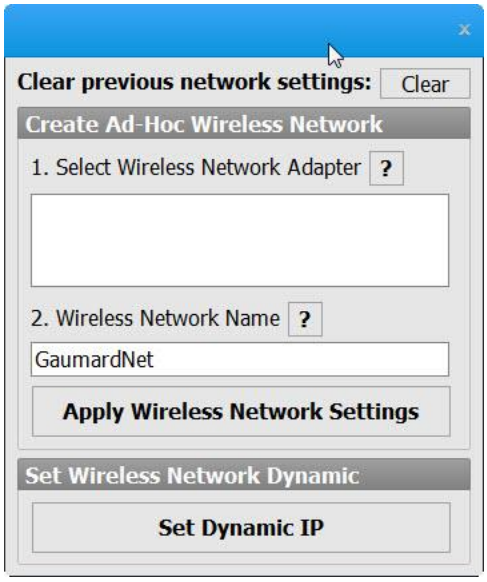
UNI NETWORK CONFIGURATION

Complete the next steps using the “Controller - Create Ad-Hoc Wireless Network” tool built in to UNI software.

1. From the menu bar, go to Help > “Create ad-hoc Wireless Network”

   The “Controller - Create Ad-hoc Wireless Network” window is displayed

2. Select the “Wireless Network Adapter”. If the wireless adapter is not listed, first enable the adapter using the Windows® network menu and then return to this window.

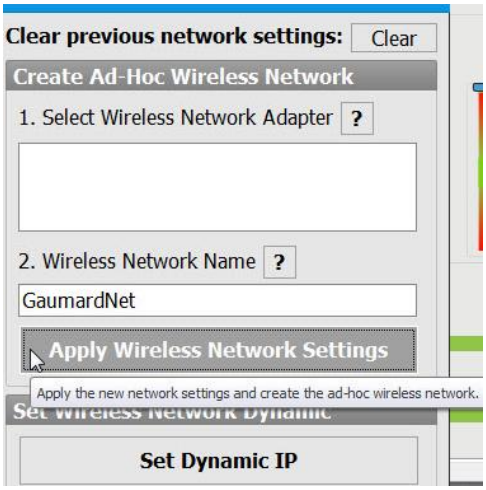


3. Enter a wireless network name (case sensitive). Use the same wireless network name to configure the Gaumard Monitors PC. “GaumardNet” is the required name for Windows® 7 computers.

4. Click “Set Dynamic IP”.to set the wireless network dynamic.

5. Click “Apply Wireless Network Settings” to save the settings.

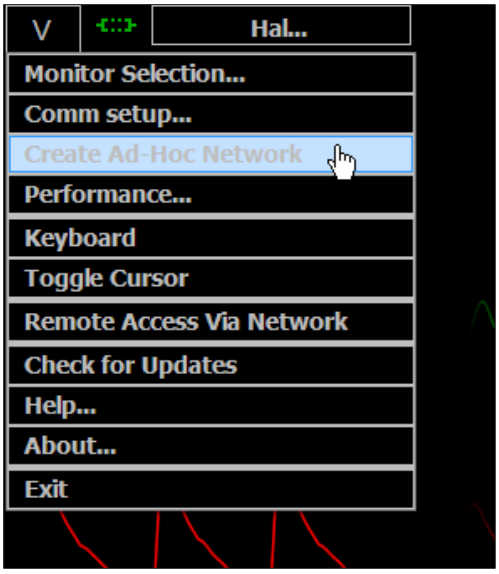
6. Restart the computer.



GAUMARD MONITORS NETWORK CONFIGURATION

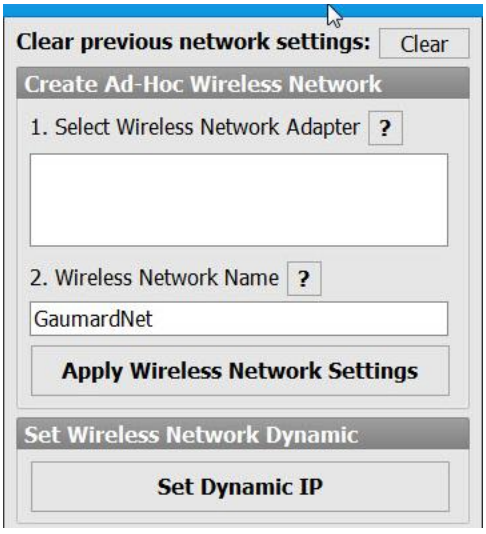
After the UNI control computer is configured, complete the next steps using the "Create an ad-hoc network tool" included in Gaumard Monitors software.

1. On the virtual monitor computer, click the Gaumard Monitors icon to start the vital signs software.
2. Click the V menu near the top left corner and select "Create Ad-Hoc Network".

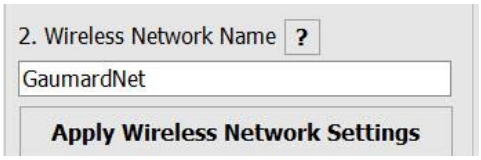


The "Virtual Monitor - Create ad-hoc Wireless Network" window is displayed.

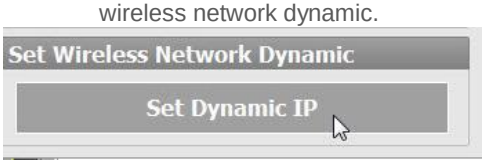
3. Select "Wireless Network Adapter". If the wireless adapter is not listed, first enable the adapter using the Windows® network menu and then return to this window.



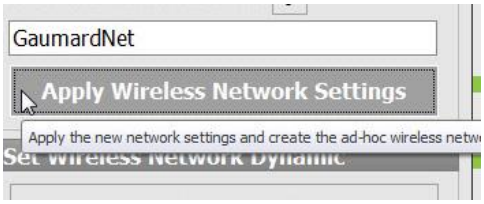
4. Enter a wireless network name (case sensitive). Use the same name entered in the controller computer. “GaumardNet” is the required name for Windows® 7 computers.



5. Click “Set Dynamic IP”.to set the wireless network dynamic.



6. Click “Apply Wireless Network Settings” to save the settings.



7. Restart the computer.

CONFIGURE THE VITAL SIGNS BROADCAST

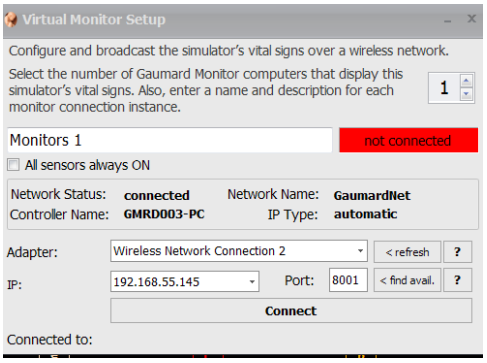
After the wireless ad-hoc link is established between both computers, complete next steps to configure the transmission of the vital signs information.

1. Verify that both computers are connected to the GaumardNet network using Windows® wireless connection menu. If the computers are not connected, select the “GaumardNet” network and click “Connect” manually.

2. Start the UNI control software.
3. On the UNI menu bar, click Monitors> Configuration.

The “HAL Virtual Monitor Setup” window is displayed on the UNI menu bar, click Monitors> Configuration.

The “HAL Virtual Monitor Setup” window is displayed.

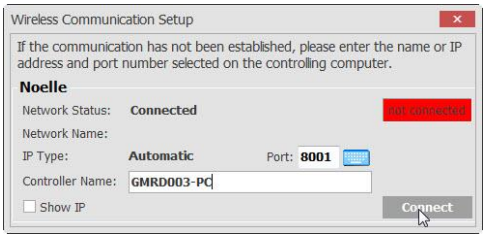


4. Set the adapter to “Wireless network connection”
5. Verify the network status and network name, then click “Connect” to begin

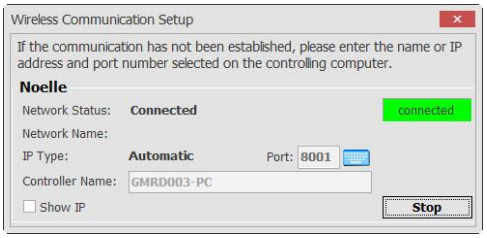
transmitting the vital signs information.

6. Write down the “Controller Name” and “Port number”.
7. Start the Gaumard Monitors software on the virtual monitor PC.
8. Click the “V” menu near the top left corner, and then select “Comm Setup”.

The “TCP Comm Setup” window is displayed



9. Click “Connect” to accept the incoming connection.



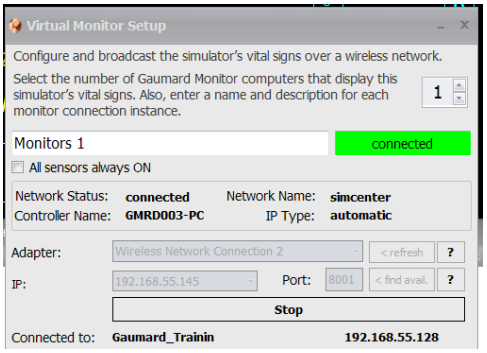
To connect both computers using a local internet network, follow the steps below:

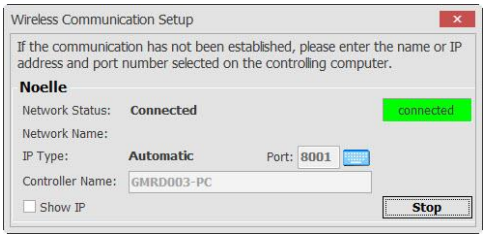
1. Verify that both computers have applied “Set Wireless Network Dynamic”. Refer to UNI and Gaumard Monitors network configuration sections for instructions.

2. Disconnect both computers to the GaumardNet network and connect them to the local network manually using Windows® wireless connection menu.

3. Repeat the same steps listed above to connect the UNI software to the Gaumard Monitors software.

4. Repeat the same steps listed above to connect the UNI software to the Gaumard Monitors software.





Replacement Parts

Contact Gaumard Scientific for a **complete list** of consumables and replacement parts and their prices. C=Consumables; R=Replacements; A=Accessories; U=Upgrades; M = Factory Repair ONLY

S3009.001	A/C Virtual Monitor	A	A/C Powered 17" Touch Screen monitor and desktop
S3009.002	D/C Virtual Monitor	A	D/C Powered 12" Touch Screen Mobile Monitor with stylus
S3009.010	Battery	C	Rechargeable battery
S3009.011	Battery Charger	R	100-240 V AC battery charger with label
S3009.020	Umbilical Cord Kit	C	Set of 3
S3009.023L.M	Lower Left Arm	C	Lower left IV arm, medium color
S3009.023R.M	Lower Right Arm	C	Lower IV right arm, medium color
S3009.026L.D	Lower Left Leg Skin Cover	C	
S3009.026L.L	Lower Left Leg Skin Cover	C	
S3009.027L.L	Lower Left Leg	R	
S3009.029R.L	I/O Leg Skin Cover	C	
S3009.031	I/O Tibia Bones	C	I/O Tibia bones
S3009.048	Neonatal Filling Kit	R	Fluid dispensing syringe for Premie HAL
S3009.060	Simulator Transport Case	R	Soft storage and transport case
S3009.080	Simulated Blood Concentrate	C	
S3009.081	Silicone Oil	C	Oil-based silicone lubricant
S3009.200	Audio & Video Recording System	A	
S3009.204	Tablet PC	R	Wireless tablet PC with stylus control
S3009.205	Bump Case	R	Bump case for tablet PC
S3009.206	RF Module	R	Radio Frequency Module with USB

			connector
S3009.EXW	Two Year Extended Warranty	A	Extended warranty for years Two **AND** Three
S3009.INST	In-Service Training	A	Day of in-service training and installation

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:

Damage resulting from accident, misuse, abuse, neglect, or unintended use of the Gaumard product;

Damage resulting from failure to properly maintain the Gaumard product in accordance with Gaumard product instructions, including failure to property clean the Gaumard product; and

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:

Contact Gaumard and request authorization to return the Gaumard product. Do NOT return the Gaumard product to Gaumard without prior authorization.

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.

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)

Contact 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

Fax: (305) 667-6085

Before contacting Tech Support **you must**:

1. Have the simulator's Serial Number (located in the left leg under the IM site)
2. Access to the simulator and the control computer if troubleshooting is needed.

Post: Gaumard Scientific

14700 SW 136 Street

Miami, FL 33196-5691

USA

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