



CAEMaestro

User Guide - Juno

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SYSTEM REQUIREMENTS

This section describes the minimum and optimal requirements to run the simulator.

Software and Hardware

Any device used to operate CAE Maestro™ must meet the following minimum hardware requirements.

Note: Periodic system updates for Maestro are available at: <https://caehealthcare.com/support/software-updates>. You can download software updates from any Windows computer with an Internet connection.

These requirements also apply to devices running Maestro Standalone.

CAE Maestro Software

The following identifies the software version associated with the release of this user guide.

Document	Document Version	Software Version
CAE Maestro for Juno	905K600552 v2.2	CAE Maestro (Juno) v2.9

Windows® Operating System

Minimum Requirements	
Software	<ul style="list-style-type: none"> Win 10 Pro .NET 4.8
Hardware	<ul style="list-style-type: none"> Surface Go 2 Intel Pentium Gold Processor 4425Y 4 GB DDR3 RAM 32 GB Hard Drive space available 1920x1280 screen resolution USB-C Wireless 802.11 a/b/g/n/ac/ax

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INTRODUCING MAESTRO

CAE Maestro™ is a user friendly software that allows facilitators to control and monitor CAE patient simulators, in addition to creating Simulated Clinical Experiences (SCEs). Maestro includes dynamic controls that allow you to adjust the physiology of the patient as you proceed through a simulation, whether you are using it On the Fly or running a programmed SCE. A patient status overview on the runtime screen allows the facilitator to keep track of the current status of the manikin and the display on the CAE Patient Monitor. Maestro's dynamic flexibility and ease of use allow you to adjust the learner's training experience to meet their needs, capabilities, and experience.

Instructor Tablet

This section describes the tablet used to operate CAE Maestro. Maestro can also be installed on a laptop as standalone software. For more information, see the *System Requirements* section of this user guide.

Microsoft Surface Go 2

A Surface Go 2 Instructor Tablet is used to run the software.

The Surface Go 2 provides the capabilities of a laptop in an ultra-portable tablet. This mobile workstation features a Windows 10 Pro operating system with an Intel Pentium Gold Processor, a 10.5 in (26.6 cm) touchscreen, and up to 13 hours of battery life. The Surface Go 2 tablet comes equipped with pre-installed instructor software.



Surface Go 2 Instructor Tablet

CAE Maestro Application Overview

Users have the following choices for managing their simulation in the CAE Maestro software:

- Run simulations “On the fly” in Manual mode
- Run simulations “On the fly” in Modeled mode using CAE Physiology
- Run preconfigured simulations using Simulated Clinical Experiences (SCEs) in Manual or Modeled mode

Simulation Mode Comparison

On the Fly vs. SCE

There are two ways to run a simulation in Maestro: On the fly and Simulated Clinical Experience (SCE). Users can start a simulation or choose to design content for the simulation and save it as an SCE.

When operating On the fly, no content is authored ahead of time and the simulation is simply controlled in real-time by the instructor.

With an SCE, some details of the simulation are defined ahead of time (e.g. states, patient profile, and other scenario background information). During an SCE, users can also make changes On the Fly as needed.

Run on the Fly

Running simulations on the fly includes no predetermined scenarios or intended progression of events, and provides facilitators with a simple way to run a simulation with no advanced programming. You can run on the fly in Manual or Modeled mode.

In Manual mode, the user drives all changes to the patient’s condition and responses to interventions by making manual selections in the software.

In Modeled mode, the simulation is automatically driven by CAE Physiology (a computational model of human physiology). This model controls patient status, progression of clinical signs, and response to interventions. Modeled mode also allows the instructor to override the model’s output with manual inputs.

Note: Only systems that include the CAE Physiology (optional on some simulators) can be run in Modeled mode.

Simulated Clinical Experience (SCE)

Simulated Clinical Experiences (SCEs) are process tools that let facilitators execute a learning strategy using simulation. Preconfigured CAE SCEs provide an extensive overview and outline of the learning exercise, and require minimal additional faculty development time for use. Each SCE is typically comprised of a patient and a scenario.

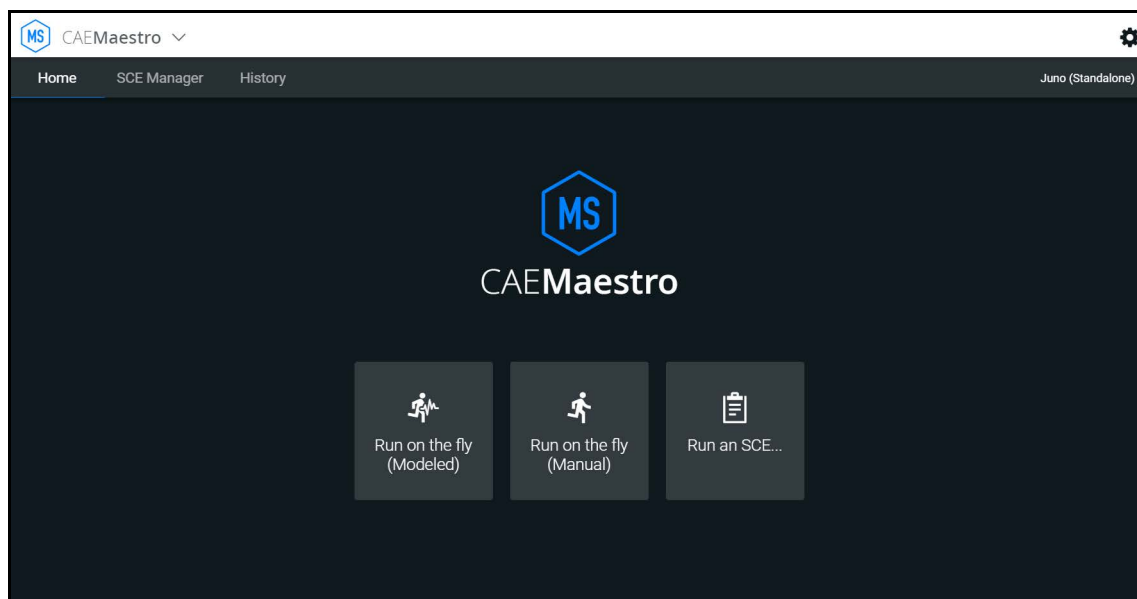
USING CAE MAESTRO

Using the CAE Maestro software, you can create and run SCEs, assess learners, and adjust system controls.

Note: For optimal performance, no other software program should be open while Maestro is running.

Starting a Simulation

Upon launching the CAE Maestro app, the Home Screen appears and users have the option to choose one of the following simulation types: Run on the fly (Modeled), Run on the fly (Manual), or Run an SCE.



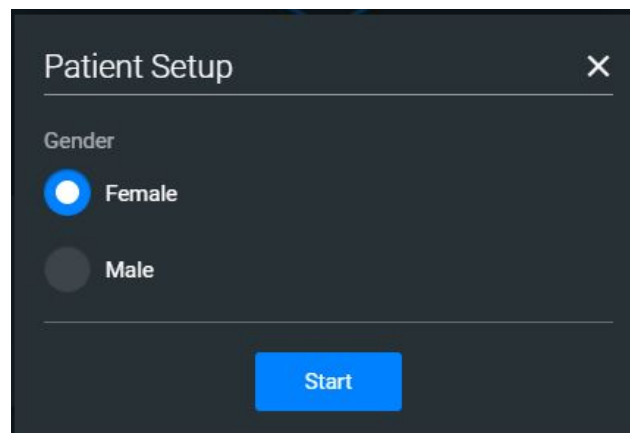
CAEMaestro Home Screen

Run on the Fly Simulations

The Run on the fly (Manual or Modeled) simulation starts a simulation without an SCE.

To begin a Run on the fly simulation:

1. From the Home Screen, tap the **Run on the fly** button.
2. Select the patient's gender.



Start Screen - Select Gender

3. Tap **Start** to begin the simulation.

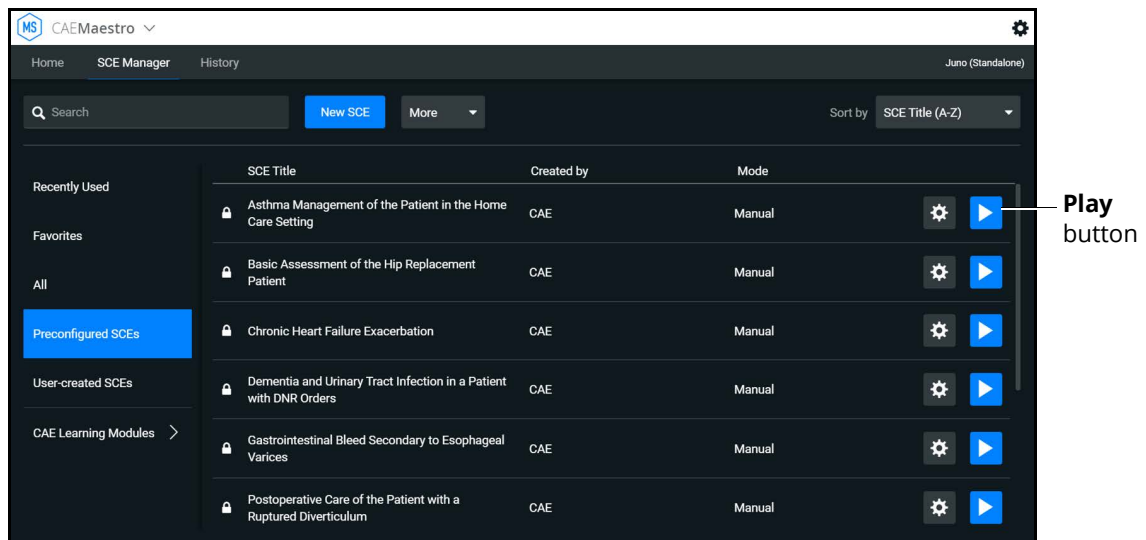
From the Run Screen, you can manually alter the patient's status and adjust parameters as needed for specific situations. The functionality in this mode is described in the *Run an SCE* section of this user guide.

Run an SCE

From the SCE Manager, various simulations are available.

To run an SCE:

1. From the Home Screen, tap **Run an SCE**.
 The **SCE Manager** tab is selected by default.
2. Tap the **Preconfigured SCEs** tab to view the list of preloaded SCEs.

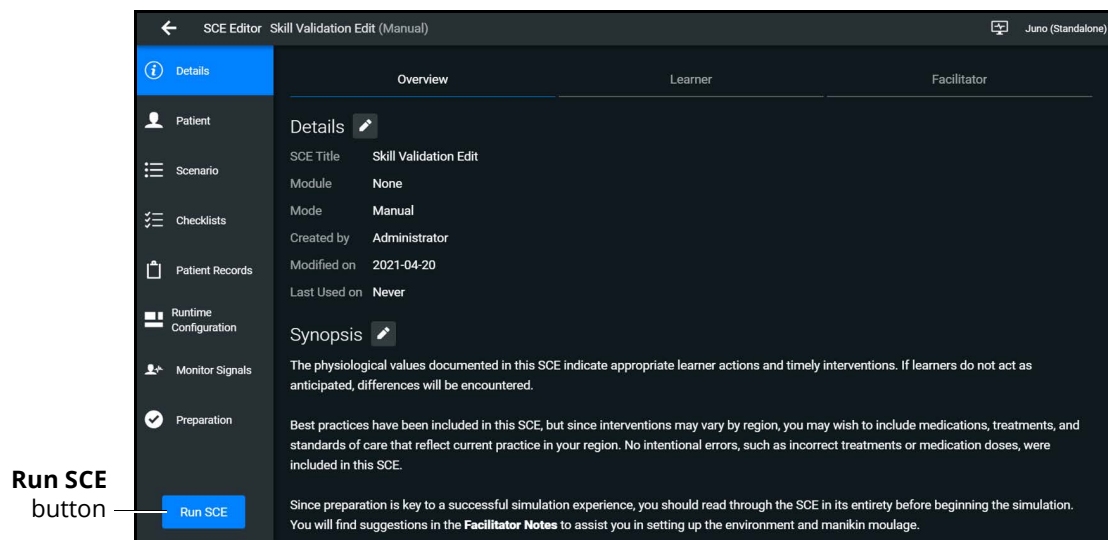


SCE Manager Screen - Preconfigured SCEs

There are two ways to start an SCE:

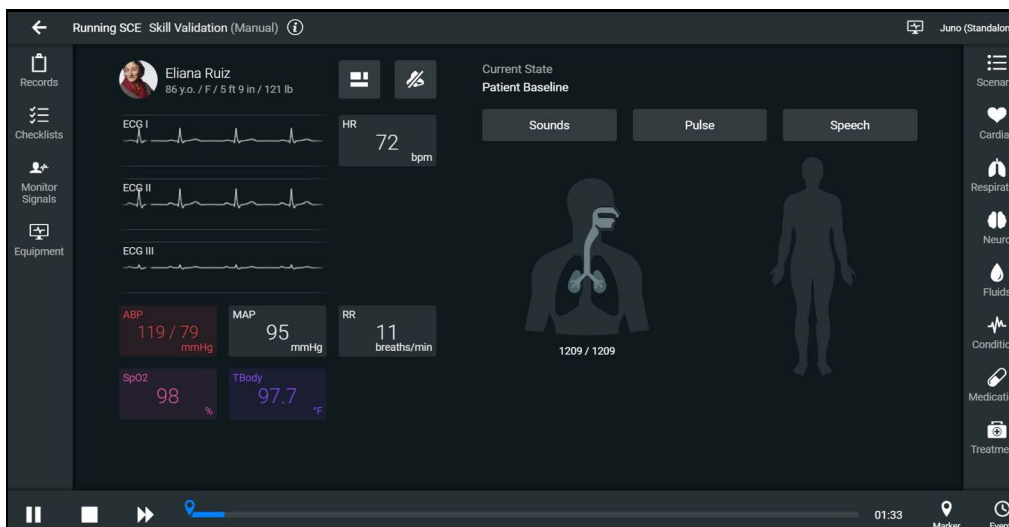
- Tap the **Play** button,
- OR
- Tap the SCE title to view SCE details before launching.

3. Tap the **Run SCE** button to start an SCE.



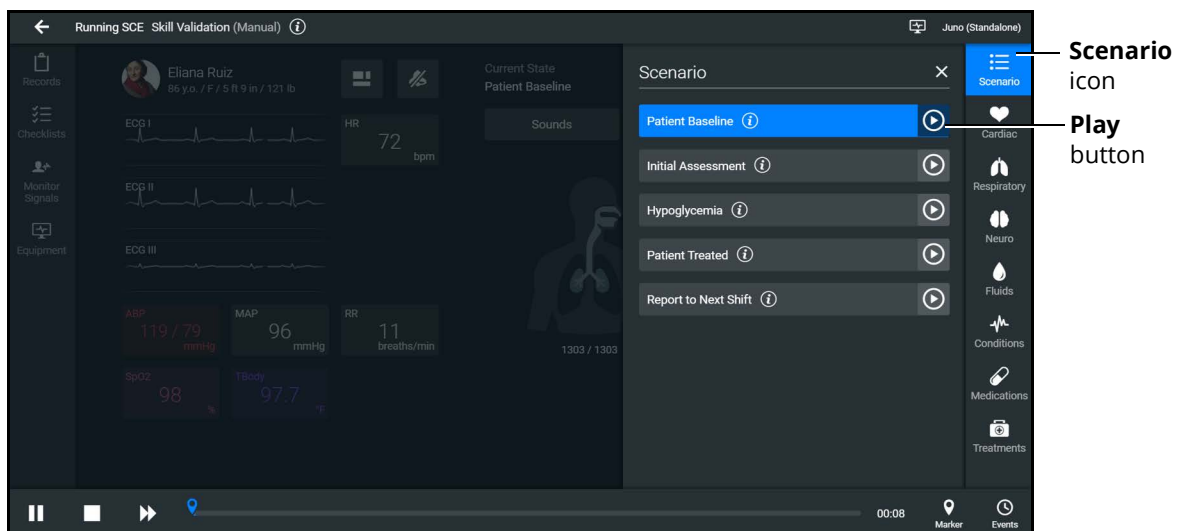
SCE Manager Details Screen - Run SCE Button

The Run Screen appears and displays the Patient Baseline state.



SCE Run Screen

4. Tap the **Scenario** icon in the upper-right corner of the Run Screen.



SCE Run Screen - Scenario Icon

The list of scenario states appears. A scenario will remain in the Patient Baseline until the **Play** button is tapped in another state.

5. Tap the **Play** button to apply a state to the running SCE.

Run Screen Features

When an SCE is started or when running on the fly, the Run Screen appears and displays a series of panels that group related controls and information. The content for each control is dynamic and varies whether you run scenarios on the fly or as an SCE. Users can adjust the status of the patient while they proceed through a simulation using these controls. When running an SCE, some panels contain additional controls.

Records

You can display patient records while an SCE is running.

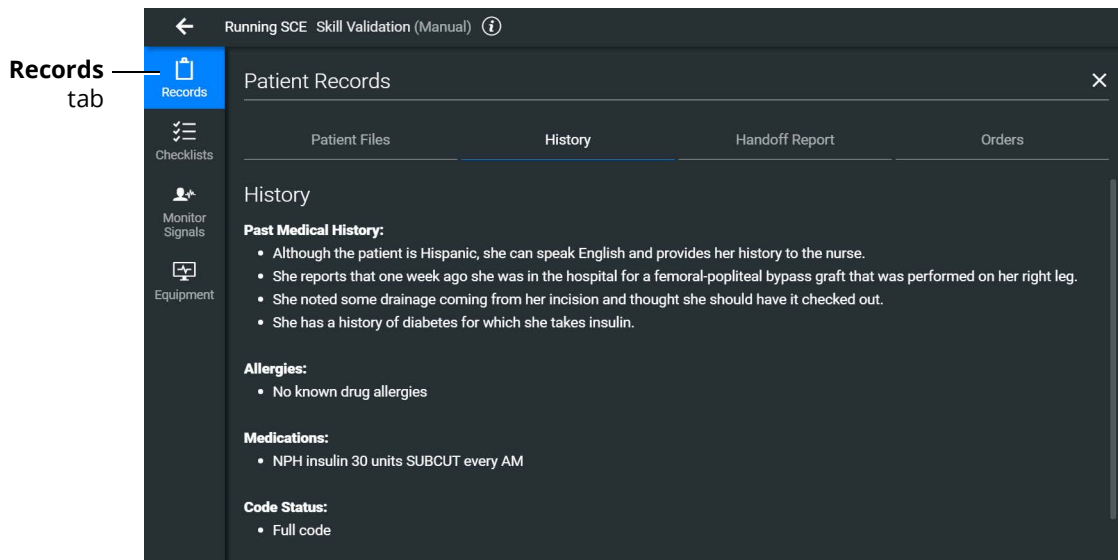
To display a patient record:

1. From the Maestro Run screen, select **Records**.

The Patient Files tab displays by default.

To view patient files, select **Show Library** button.

The list appears with all available patient records appears.



Patient Records - History

2. (Optional) To preview a patient record before sending to the Patient Monitor, select the record and tap the **Preview** button.
3. Select a patient record and tap **Send to Patient Monitor**.

The patient record opens in CAE Patient Monitor.

Note: Only one patient record displays at a time.

To stop displaying a patient record in the Patient Monitor, on the patient record tap **Remove from Patient Monitor**.

To close the Patient Record list, tap **Records**.

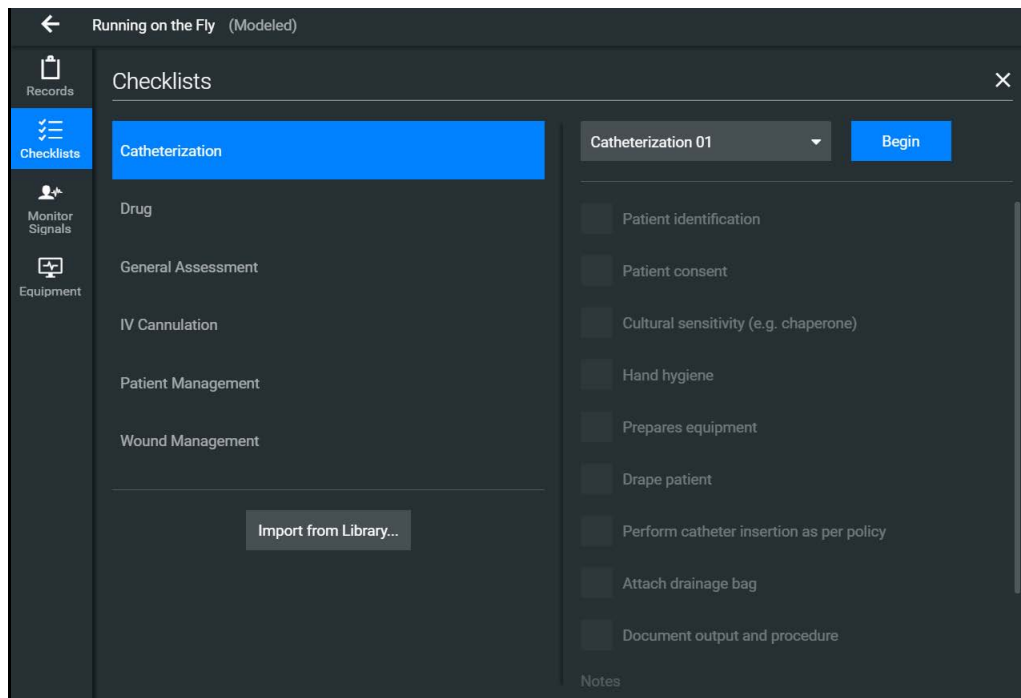
Checklists

To access learner checklists:

1. Tap the **Checklist** tab.

When a checklist is selected it is highlighted in blue and the content of the checklist is displayed in the right panel.

2. Tap **Begin** to launch the first checklist and start verifying steps performed by learner.



The Checklists Popup Screen

3. After a checklist has been completed, tap **New Instance** to begin another checklist for the next learner.

The Checklist drop-down list displays each instance completed, numbered 01 as first instance, 02 as second instance, etc. within each state.

4. Tap the **X** to close the Checklist panel.

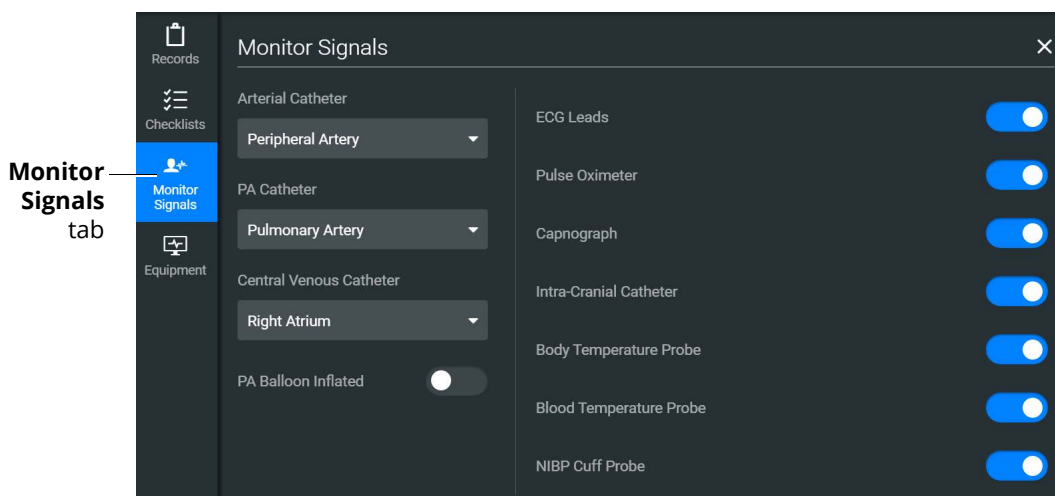
Monitor Signals

The Monitor Signals tab gives the users control over the values and signals that appear on the simulated Patient Monitor.

Tap the **Monitor Signals** icon to define which patient indicators will be monitored.

Use the drop-down menus to define which patient parameters will be visible for learners viewing the patient monitor.

Use the toggles to turn the various values and signals on and off.



Monitor Signals

By default, all probes are on. When probes are turned off, it impacts different waveforms and numerical values on the patient monitor.

Probe Turned Off	Impact
ECG Leads	Hides the ECG waveform and HR value
Pulse Oximeter	Hides the PLETH waveform and SpO2 value
Capnograph	Hides the CO2 waveform and EtCO2 value
Intra-Cranial Catheter	Hides the Intra-Cranial Catheter values
Body Temperature	Hides the TBody values
Blood Temperature	Hides the TBlood values

Setting the catheter placement to Atmosphere causes a flat line to appear, even when an override is used. Available catheters include:

- Arterial Catheter
- PA Catheter
- Central Venous Catheter

If the catheter placement is *None*, no trace appears at all.

Tap the **PA Balloon Inflated** toggle to inflate the patient's PA Balloon. Tap it again to deflate.

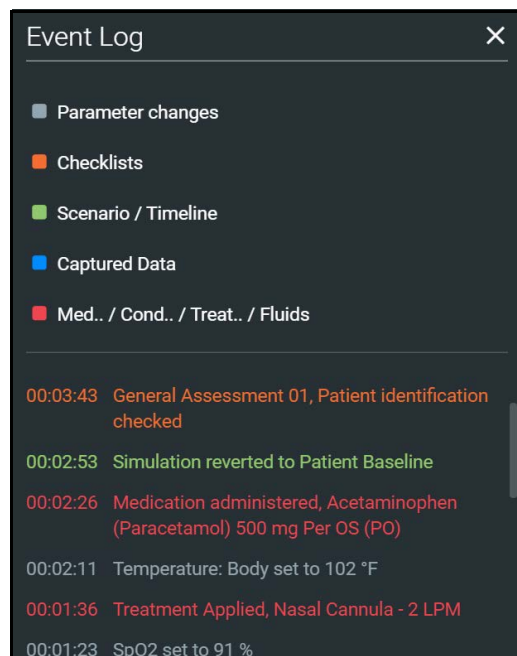
For more information about monitor signals, see *Appendix A - Parameter Descriptions*.

Event Log

During an SCE, all changes (manual or detected by the system) to simulation settings, learner actions, and checklist results are recorded in the Event Log.

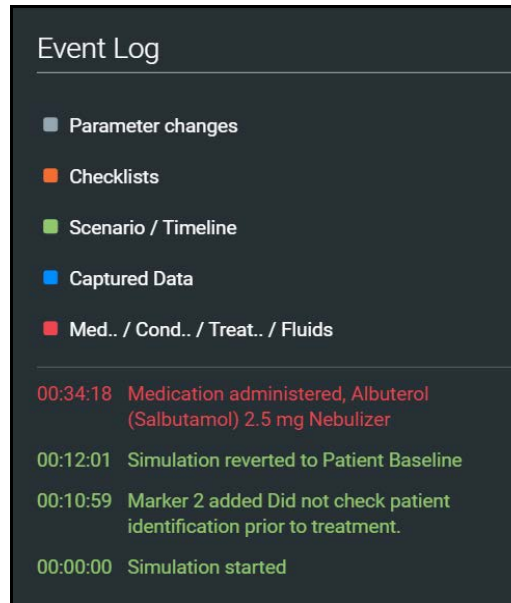
To access the Event Log, tap the **Events** button in the bottom-right corner of the Run Screen.

The event log records the time and details of instructor and learner actions, which are color coded by category.



Event Log

In Manual SCEs, the administered medication information tracked in the Event Log does not have an automatic effect on patient physiology.



The screenshot shows a dark-themed 'Event Log' window. At the top, the title 'Event Log' is displayed. Below the title is a legend with five categories, each represented by a colored square: a grey square for 'Parameter changes', an orange square for 'Checklists', a green square for 'Scenario / Timeline', a blue square for 'Captured Data', and a red square for 'Med.. / Cond.. / Treat.. / Fluids'. Below the legend, a list of events is shown, each with a timestamp and a description. The first event, at 00:34:18, is highlighted in red and reads 'Medication administered, Albuterol (Salbutamol) 2.5 mg Nebulizer'. The second event, at 00:12:01, is highlighted in green and reads 'Simulation reverted to Patient Baseline'. The third event, at 00:10:59, is highlighted in green and reads 'Marker 2 added Did not check patient identification prior to treatment.'. The fourth event, at 00:00:00, is highlighted in green and reads 'Simulation started'.

Timestamp	Event Description
00:34:18	Medication administered, Albuterol (Salbutamol) 2.5 mg Nebulizer
00:12:01	Simulation reverted to Patient Baseline
00:10:59	Marker 2 added Did not check patient identification prior to treatment.
00:00:00	Simulation started

Medication Information in Event Log

Reset an SCE

Resetting an SCE brings the patient's initial status data back to its original status. The SCE time is unaffected. Reset data appears in the Event Log.

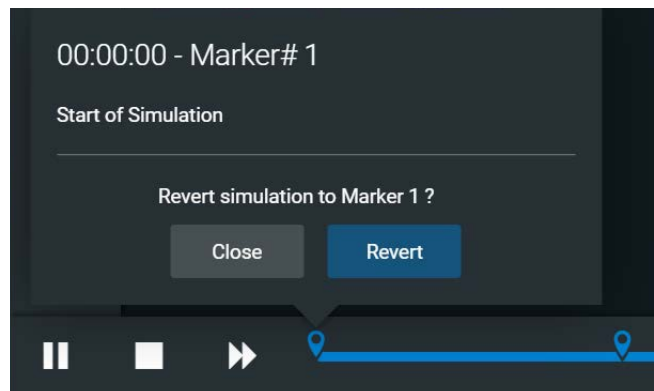
To reset patient data:

1. While running an SCE, select the first marker on the timeline.



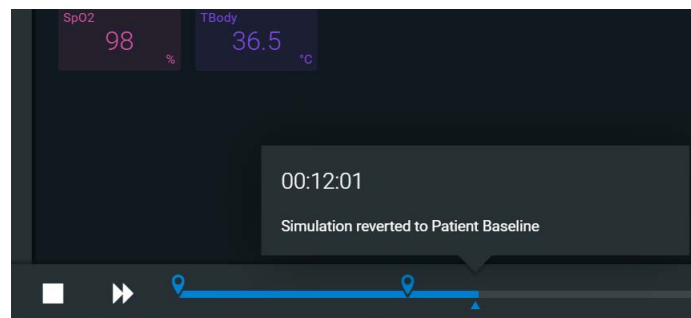
Timeline

2. Tap **Revert**.



Revert to Marker

The patient returns to the Baseline state. The patient reset is indicated on the SCE timeline bar and in the Event Log.



Reset Notification

Changing Patient Status

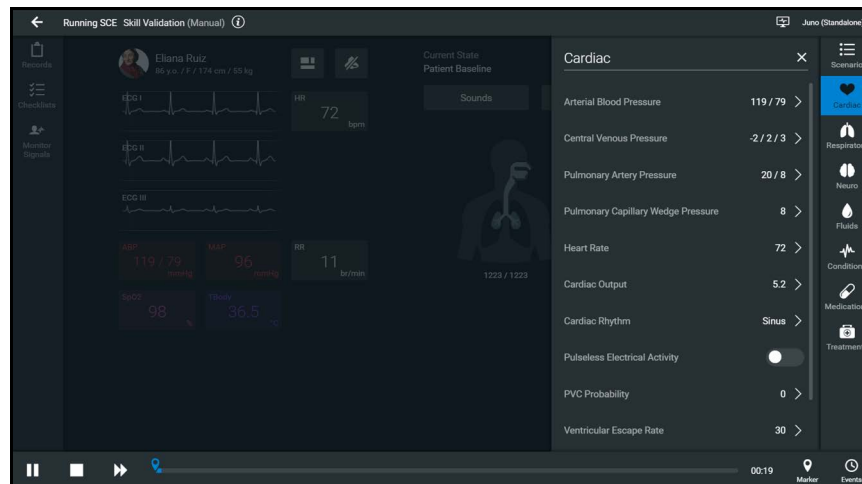
You can adjust the patient status when running on the fly or running an SCE by:

- Using one of the parameter panels on the Run Screen to modify parameters. For more information, see *Patient Status Display* section of this user guide
- Applying a Condition, Treatment, or Medication
- Applying a Scenario state

Patient Status Parameters

From the Run Screen, select a parameter icon to display the associated parameters panel for various body systems and features. To access a parameters panel, tap the appropriate icon or button on the right side of the Run Screen for:

- Cardiac
- Respiratory
- Neuro
- Fluids



Run Screen with Cardiac Parameters

Types of Parameters

There are two types of parameters: numeric and discrete.

Once a parameter is selected and set, the patient’s physiology changes according to the model for that parameter.

Numeric Parameters

To change numeric parameters, tap in the relevant field and enter a new value in place of the existing one. Or, use the slider to move through the range of parameter values until the numeric value is established.

In Run on the fly Modeled mode, there are a larger set of parameters that are either monitored patient values, or physiological model inputs. When users set or modify monitored patient values, it overrides the output of the physiological model. To return to a physiologically modeled value, tap the **Modeled** button and tap **Accept**.

Changing physiological model inputs indirectly impacts the output of the physiological model. When a modeled input is called a Factor, it acts as a multiplier. For example, Heart Rate Factor 2.0 is two times the baseline Heart Rate.

Discrete Parameters

Discrete parameters let users choose the appropriate option from a drop-down menu or toggle switch.

The following image shows the Bronchial Occlusion controls in the Respiratory parameter. The Bronchial Occlusion control is set using a discrete parameter switch that toggles between **OFF** and **ON**.



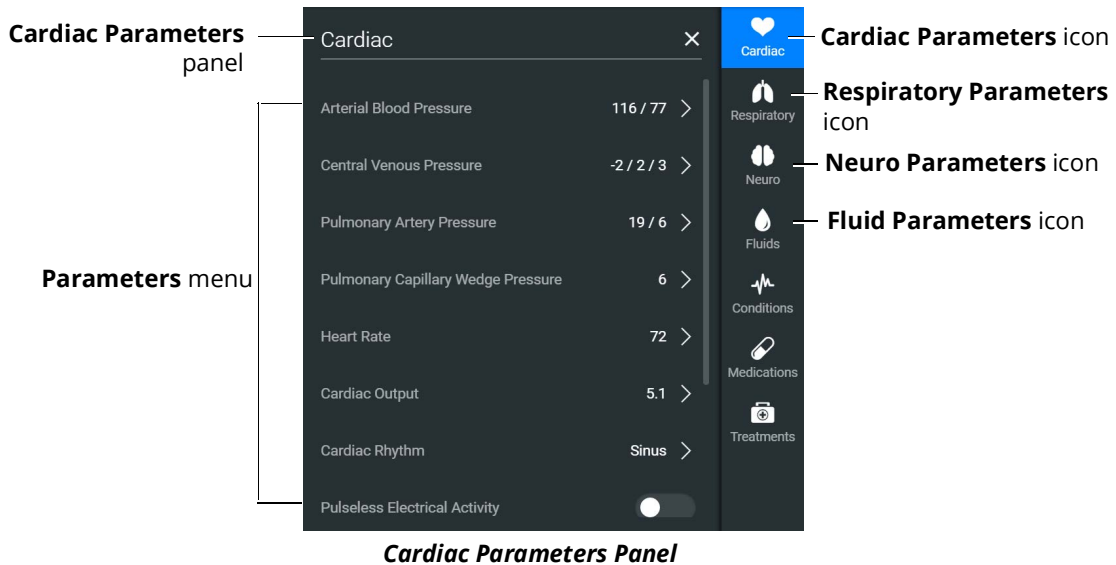
Bronchial Occlusion Parameter

Some parameters have two toggle switches or buttons, one for each side of the manikin.

Changing a Patient's Parameters

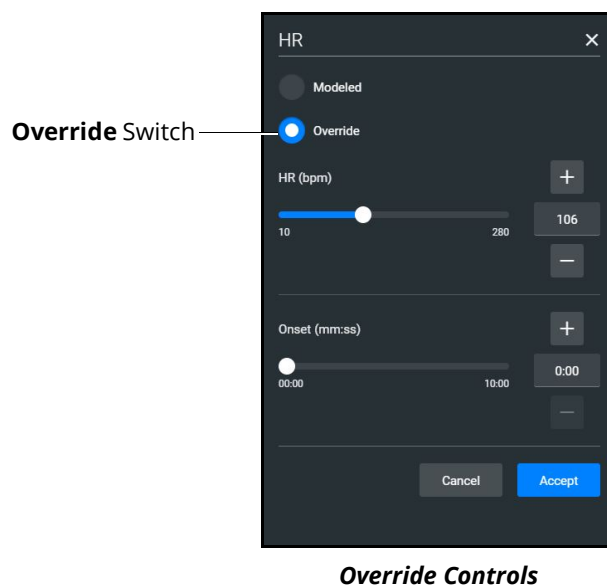
To change a patient's parameters:

1. Tap the appropriate parameters icon to view the parameter panel.

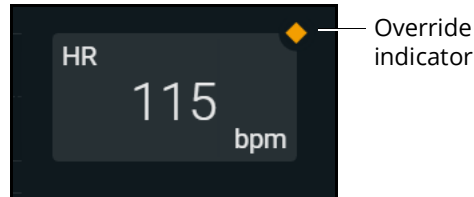


If running on the fly or running an SCE in Modeled mode, the parameters will display the physiological responses in real-time.

Note: Patient status parameters can be toggled between modeled and override modes. Tap the arrow next to a parameter to open the control menu on the right side of the screen. Turn on the Override switch to adjust settings as desired, then tap **Accept**.

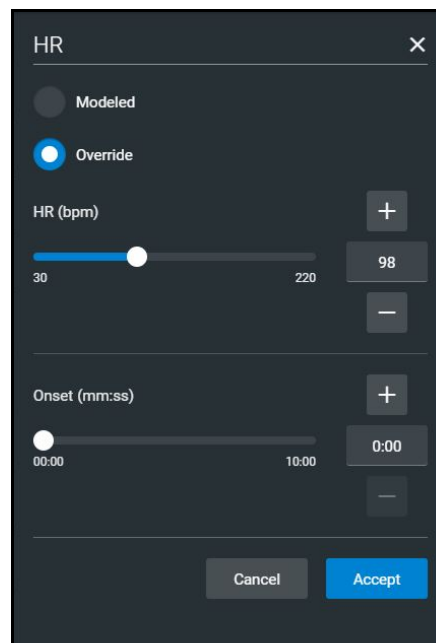


When you override a setting, an orange diamond-shaped indicator will appear at the upper-right corner of that parameter icon to show it is no longer driven by the model. The same indicator will also appear on the parameter widget and associated waveforms.



Override Indicator

2. Select the desired parameter. The Parameter Controls screen appears.



Heart Rate Parameter Controls

3. Set the new value and tap **Accept**.

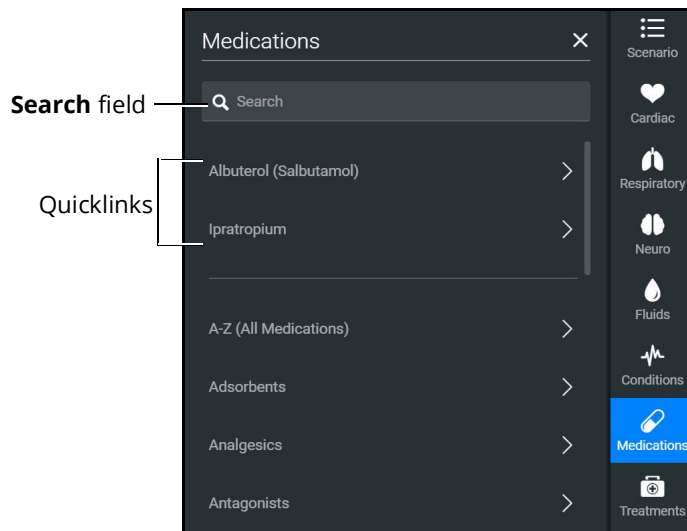
Applying Conditions and Interventions

Conditions or interventions, such as medications and treatments, may be applied during simulation. Once applied, conditions are reflected in the patient's physiology (if in Modeled mode) and logged. All medications and other interventions are also logged, and most also affect the patient's physiology (in Modeled mode only).

When programming an SCE, conditions, medications, and treatments likely to be used in a given simulation case can be set up as Quicklinks, which will appear in alphabetical order at the top of the panel for quick access.

Note: Quicklinks can only be added when creating or editing an SCE.

To learn more about setting up Quicklinks, see *Runtime Configuration* in *Using the SCE Editor* section of this user guide.



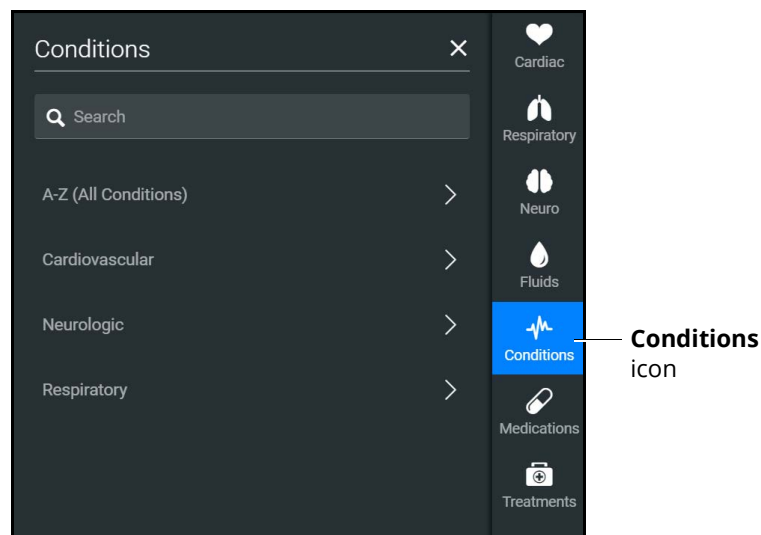
Medications Panel - Quicklinks

TIP: Tap the appropriate icon to collapse or expand the control.

Conditions

Conditions are preprogrammed pathophysiological states that incorporate one or more physiological parameters and are designed to enable multiple physiological changes more easily. Conditions are similar to scenario states in that they can contain multiple parameter changes that make it easy to quickly adjust the patient's status.

Conditions are especially useful when programming in Modeled mode, where they continuously interact with the modeled physiology and any interventions to ensure appropriate changes for the condition.



Conditions Panel

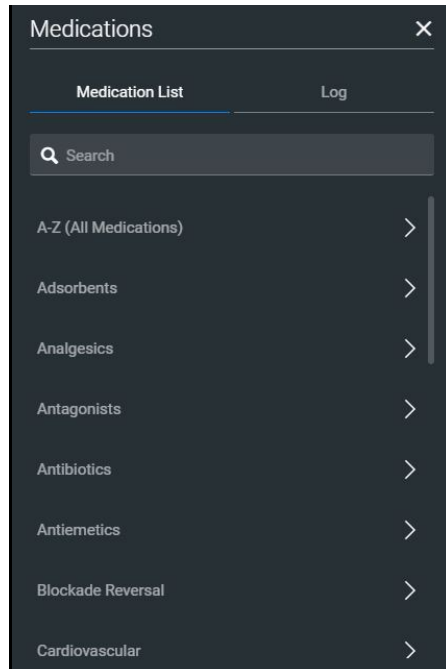
To apply a condition:

1. In the **Conditions** panel, tap a Quicklink, if available, or select a condition from within the listed categories or by tapping on **A-Z (All Conditions)**. You can also use the Search feature to quickly find a specific condition.
2. Tap the name of the desired condition and select a severity, if available.
3. Tap **Apply condition**.

Medications

To choose a medication:

1. In the **Medications** panel, tap one of the Quicklinks, or from the Medications list, tap **A-Z (All Medications)** to browse all medications in alphabetical order, or use the Search feature to quickly find a specific medication. Medications are also grouped by category below the **A-Z (All Medications)** list option.

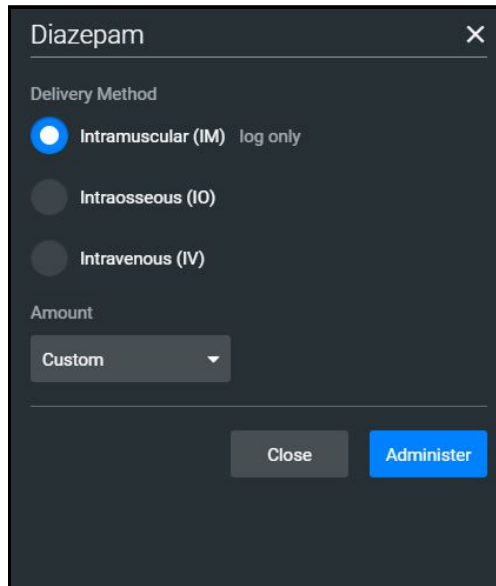


Medications Panel

A menu appears and shows the available medications.

2. Tap on a specific medication to choose a dose and route of administration.

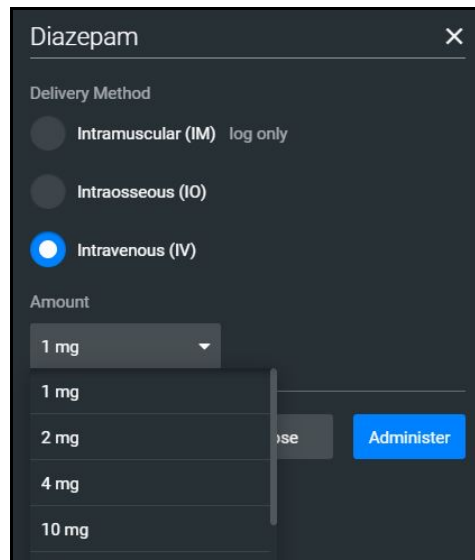
The medication controls appear. The delivery method and amount options, which include pre-defined doses and custom dose options, are displayed.



Medication Controls

Under **Delivery Method** options, tap the desired route of administration.

In the **Amount** drop-down menu, select a pre-defined dose or choose Custom to enter a custom dose.



Custom Dose

3. Tap **Administer**.

Note: All administered medications are added to the **Event** log.

In Manual mode, administered medications do not affect the patient’s status. Any associated changes to the vital signs or other parameters must be manually adjusted. For more information, see *Changing Patient Status* section of this user guide.

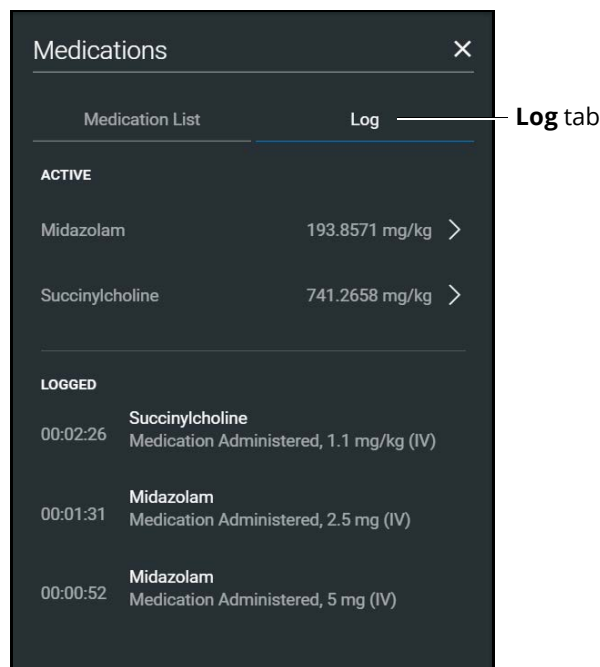
In Modeled mode, medications affect the patient's status unless labeled *log only*. Medications are also logged in the **Log** tab on the **Medications** panel.

The Medications Log

The Medications Log, present in Modeled mode only, tracks the administered medications. If applicable, the infusion rate of the medication is also displayed.

To view the Medications Log:

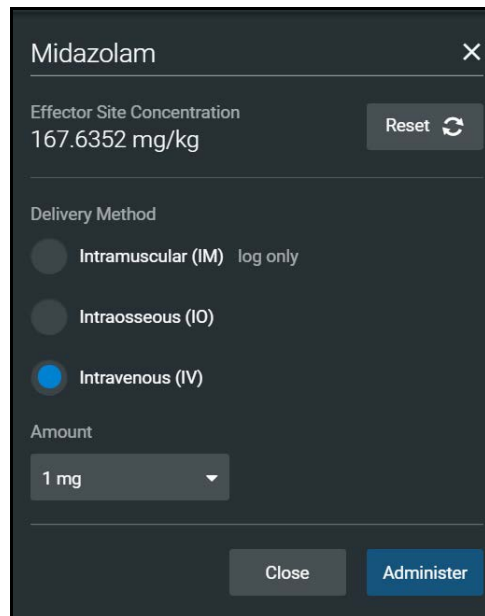
1. From the Run Screen, tap the **Medications** control.
2. Tap the **Log** tab.



Medications Log

The medications that have previously been administered appear in the *Logged* section of the screen. Medications that are currently impacting the patient physiology appear in the *Active* section of the screen.

Tap an active medication to display medication information.



Medication Information

The normalized effector site concentration is shown next to each medication listing. This represents the amount of medication that is affecting the patient physiology.

Reset a Medication

To reset a medication:

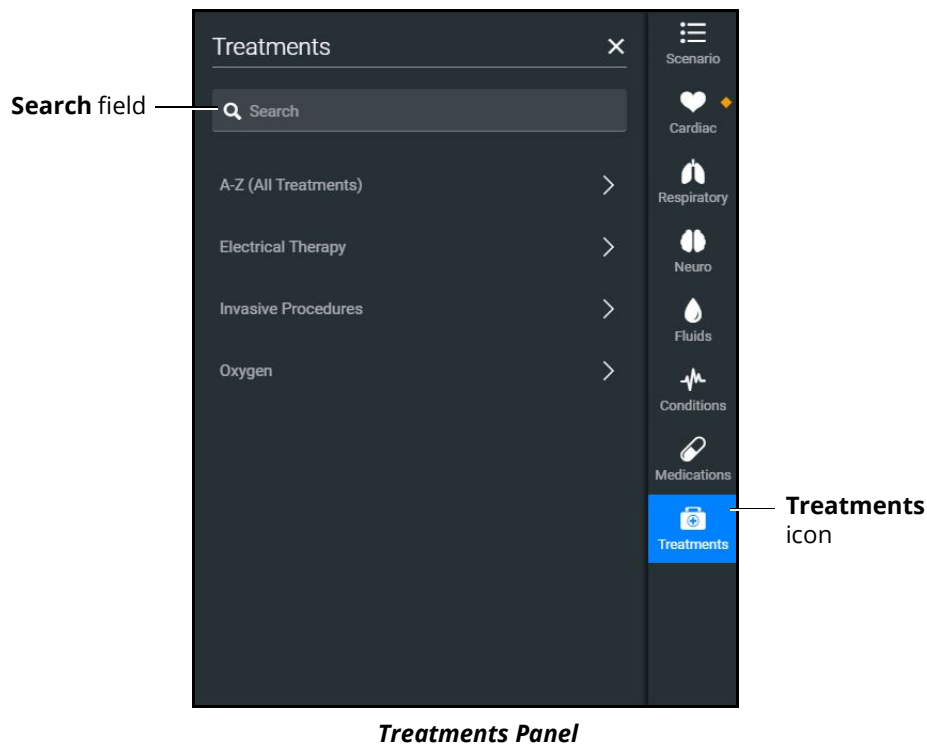
1. From the Medications Log, select an active medication.
2. From the medication information, tap **Reset**.
3. When the Reset Effector Site Concentration prompt appears, tap **Reset**.

The medication is cleared from the Active list. The original administration information remains in the Medications Log, however, and the **Events** Log reflects both the administration and resetting of the medication.

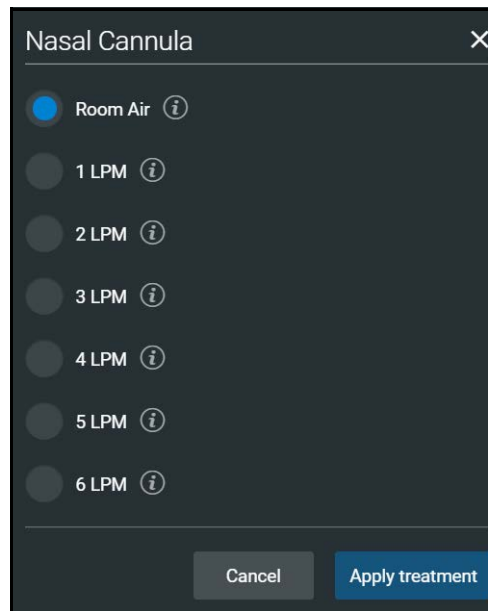
Treatments

To apply a treatment:

1. Tap the **Treatments** icon and select a treatment from the Quicklinks, or select a category to see treatments organized by type, or tap **A-Z (All Treatments)**. You can also use the Search function. Navigate through the menus to locate the desired treatment.



Make further selections as needed, such as the Room Air or LPM of oxygen for the nasal cannula.



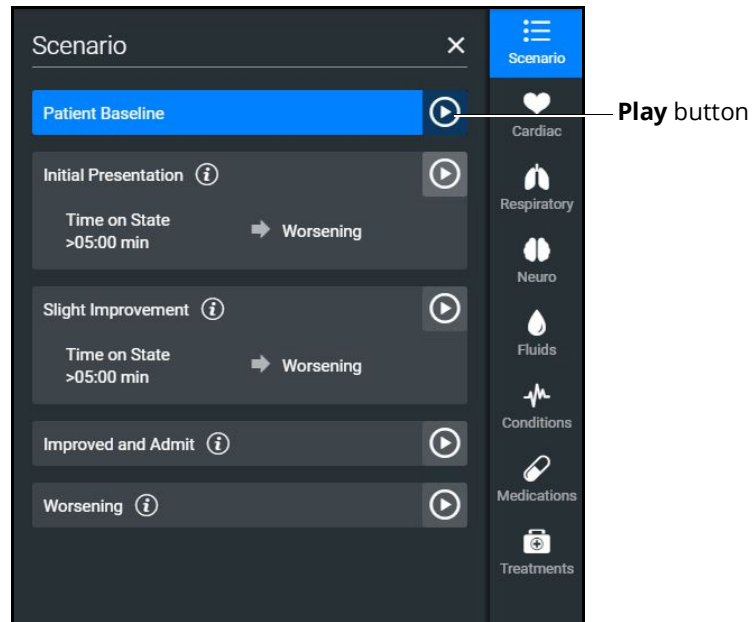
Treatments Menu

2. Select a treatment and tap **Apply treatment**.

Transitioning Scenario States

To move between scenario states from the Run Screen:

1. Tap the **Scenario** icon to expand the scenario panel.



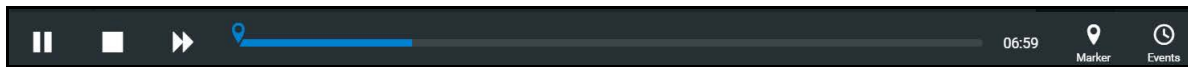
Scenario Management Panel

2. Tap the **Play** button in the desired state to advance from the current state to the desired state.

To pause or continue a scenario, tap the **Pause** or **Play** button from the Scenario Management menu.

SCE Timeline Controls

The SCE timeline controls are located at the bottom of the Run Screen.

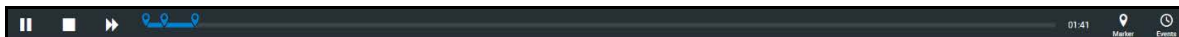


Timeline

- The **Timeline** bar shows the amount of time that has elapsed and markers that have been created.
- The **Marker** button places a marker at the current point in the SCE. The marker can be used to annotate, or to reset the patient's physiology to what it was when the marker was placed. For more information, see *Using Markers* section of this user guide.
- The **Fast-Forward** button accelerates the SCE time to a 4x or 8x speed. This feature is optimal to obtain monitor readings for the learners to reference during scenarios, as well as advance the states and programmed physiology in a shorter amount of time.
- The **Pause/Play** button pauses the SCE (and the simulator) or starts the SCE if it has been paused. The **Pause/Play** button also returns the SCE time to normal speed after **Fast-Forward** has been selected.

Using Markers

To annotate the timeline, tap the white **Marker** button to the right of the timeline.



Timeline with Markers

A blue marker appears on the timeline bar and the Marker panel appears. Notes or comments may be added as needed. Tap **Save**.

00:07:01 - Marker# 2

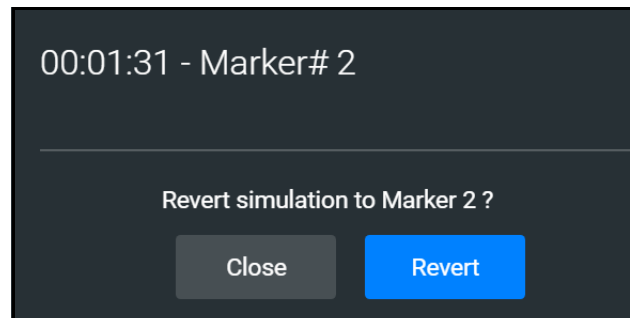
Notes

Add note...

Cancel Save

Marker Panel

To return to the patient status at the time a marker was created, tap the marker on the timeline, then tap **Revert**.



Revert to Marker #2

The patient's status returns to the selected point in the timeline.

Note: When running an SCE, the SCE time continues moving forward and does not reset to the marker time.

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PATIENT DISPLAY

The Patient Status appears when running on the fly or running an SCE.

The Patient Status displays the same information except when running an SCE:

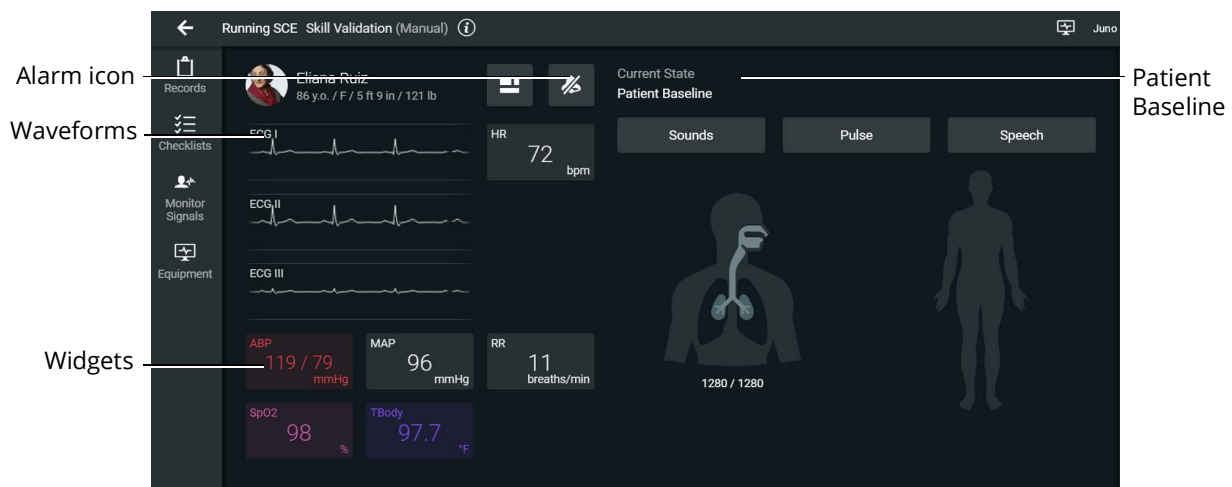
- the Current State (e.g. Patient Baseline) appears
- the Scenario icon appears at the upper-right of the Run screen

Patient Status Display

Patient Status display appears in the main frame on the Run Screen when running on the fly or running an SCE. From this screen, users can:

- tap the Alarm icon to mute or unmute alarm sounds.
- tap waveforms, numeric widgets, and other parameters to adjust them.
- edit a layout.

The status includes numeric data and waveforms, as well as the Patient Baseline if running an SCE.



Patient Status Display

Patient Controls

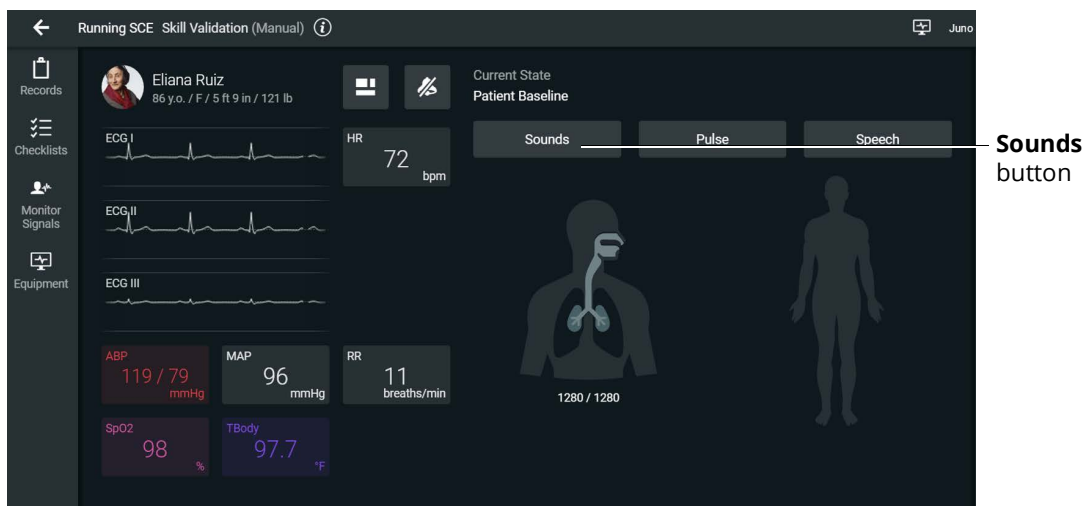
The patient's current state is shown on the Patient Status Display, allowing users to easily adjust parameters and patient states. The following controls are available whether running on the fly or running an SCE:

- Sounds
- Pulse
- Speech
- Respiratory

Sounds

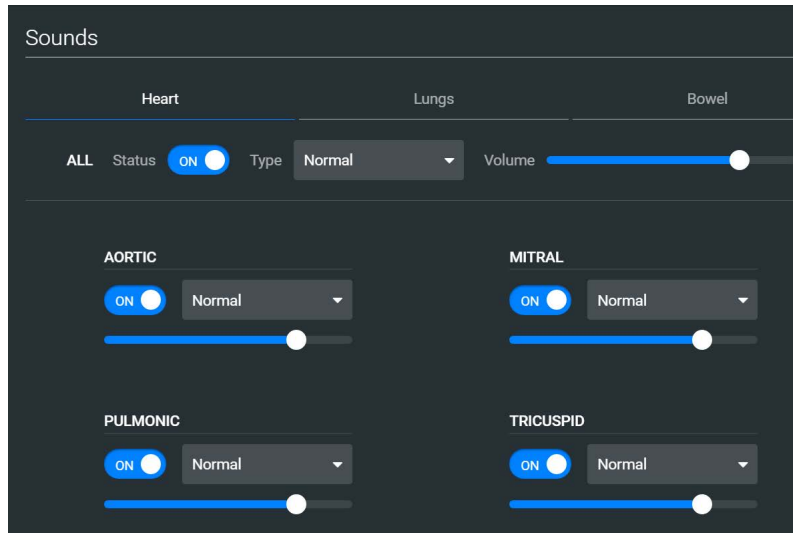
To change Sounds:

1. From the Patient Status Display screen, tap the **Sounds** button.



Patient Baseline - Sounds Button

- Adjust Sounds including heart, lung, and bowel sounds by choosing each sound tab and using the drop-down menus, toggles, and sliders as desired. Close the panel (by tapping the **X**) to apply the changes.

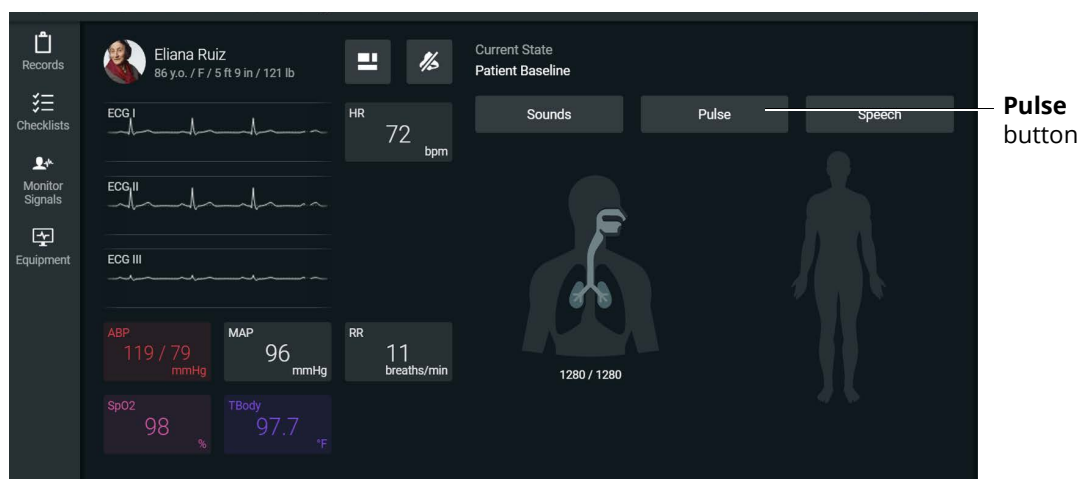


Patient Baseline - Sounds States Panel

Pulse

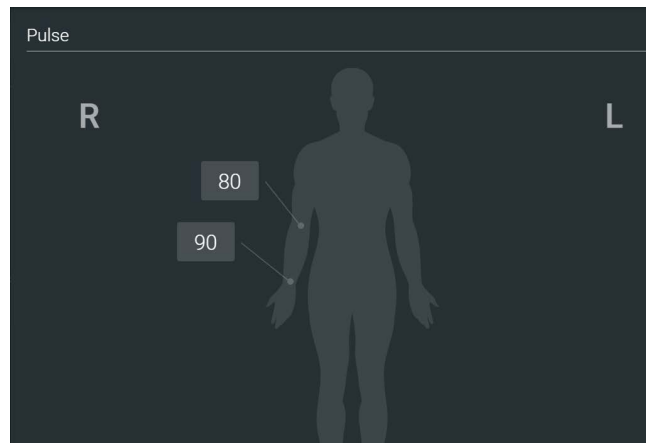
To change pulse parameters:

- From the Patient Status Display screen, tap the **Pulse** button.



Patient Baseline - Pulse Button

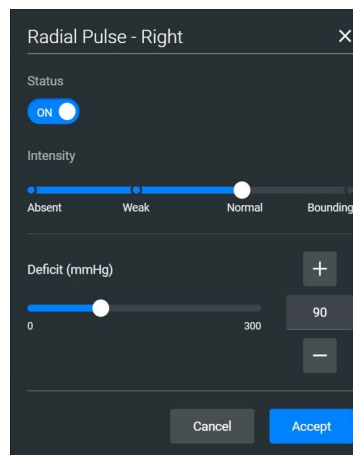
The Pulse panel appears.



Pulse Deficit Default Values

The numeric widgets display the *pulse deficit value* for each associated location on the patient body diagram. This is the value at which the pulse will disappear if the systolic blood pressure drops below that value. The pulse deficit values default settings are the accepted clinical values, but these may be modified using the controls, if desired.

2. Tap a numeric widget, and the associated pulse parameter control window will open allowing you to adjust the pulse parameter controls.



Pulse Parameter Controls

3. Tap the **Accept** button to apply the changes.

Speech

Juno comes equipped with many speech options and vocal speech sounds. Speech can be turned on or off and volume can be adjusted.

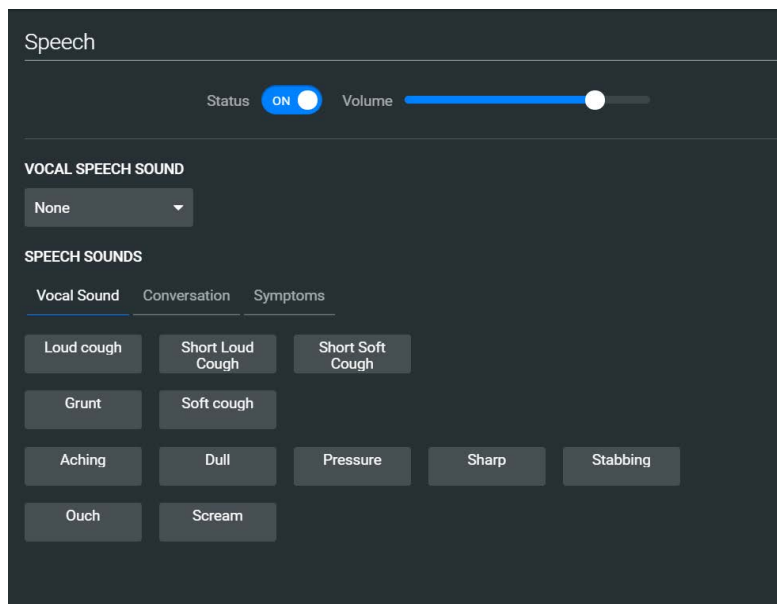
To choose speech and vocal speech sounds:

1. From the Patient Status Display screen, tap the **Speech** button.



Patient Baseline - Speech Button

The Speech panel appears.



Speech Panel

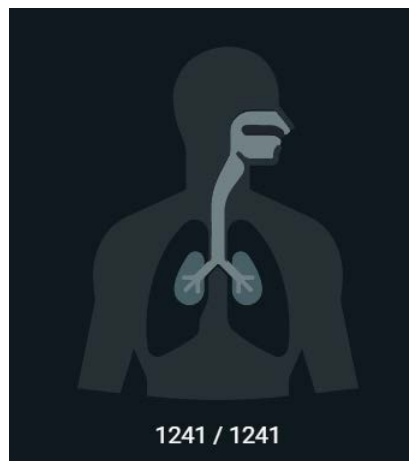
2. To turn the speech on or off, tap the **Status** toggle. Adjust the slider next to the Status toggle to control the speech volume.

3. Tap the **Vocal Speech Sound** drop-down box to open the menu and select an option as desired.
4. Tap **Vocal Sound, Conversation,** or **Symptoms** to view the list of speech options. Click on a speech option as desired.

Respiratory

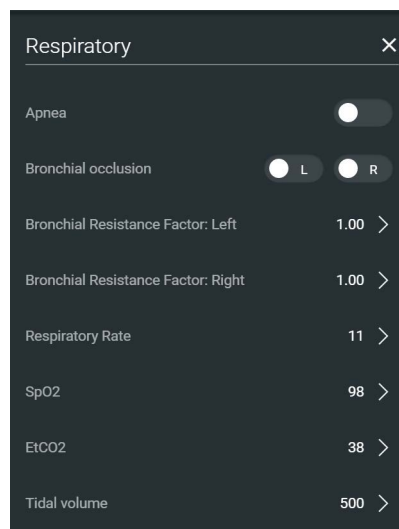
To adjust respiratory parameter controls:

1. From the Patient Status Display screen, tap the airway avatar.



Airway Avatar

The Respiratory Parameter Controls panel appears.



Respiratory Parameter Controls

2. Adjust the controls as desired. Close the panel (by tapping the **X**) to apply the changes.

Change the Control Widget Layout

You can change the layout of the patient vitals display and save parameters as part of the layout.

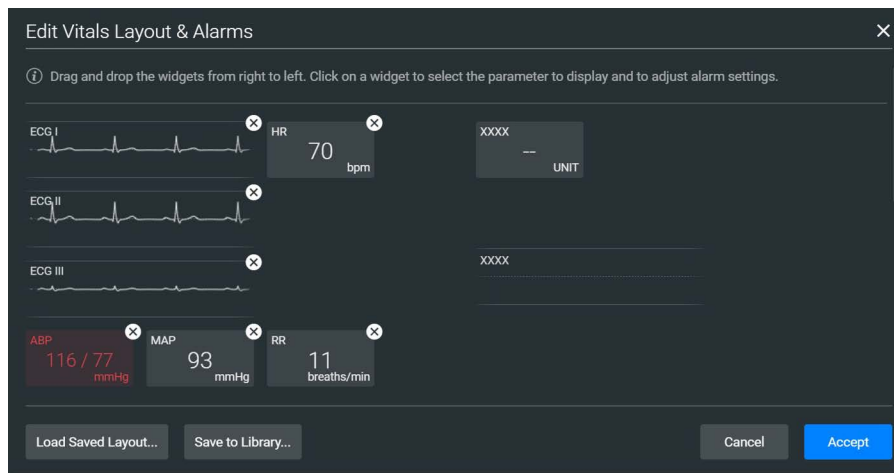
To change the control widget layout:

1. In the Run Screen, tap the **Patient Status** button.



Patient Status Button

The Edit Vitals Layout & Alarms panel appears.



Edit Vitals Layout and Alarms

2. Either begin modifying the baseline layout or tap **Load Saved Layout** to select another patient display layout to modify.
3. Drag and drop a waveform or numeric widget from the right side of the panel to an available display space on the left.

Once in place, the Select Waveform or Select Numeric Widget panel appears.

4. Tap a widget to modify which value will be displayed.
5. To delete a widget, tap the **X** to delete it.

Note: When a widget is deleted, there will be a blank space. Widgets are not rearranged.

6. Select or change the physiological parameter(s) as needed. Tap **Save**.
7. When the Edit Vitals Layout & Alarms panel appears either:
 - Tap **Accept** to update the layout without saving it.
 - Tap **Save to Library** to save the layout

Note: When changes are applied in Runtime, the layout is stored for Runtime only. In the case of the SCE editor, the changes would be stored with the SCE so that a copy of the layout is locally stored with the SCE. This way, they are not impacted by changes to the layouts, or if the SCE is moved to another simulator.

Onset, Read-Only, and Override Indicators

Onset indicators are blue, rotating circles that indicate when the value of the parameter is in transition. Read-only indicators are yellow triangles that indicate a parameter is read-only and cannot currently be modified by the user (occurs in Manual Mode only).



Onset and Read-only Indicators in Manual Mode

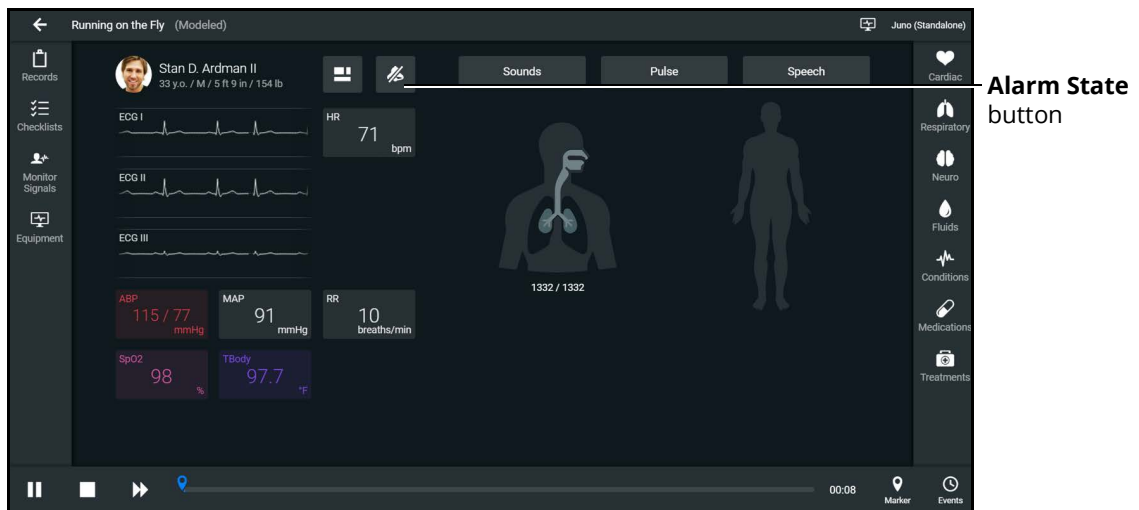
Override indicators are yellow diamonds indicating a user selection is currently overriding a modeled value (occurs in Modeled Mode only).



Onset and Override Indicators

Alarm State

When an alarm is not muted and a value reaches critical state, the associated widget flashes.



Alarm State Button - Unmuted

To mute the alarms, tap the **Alarm State** button. The icon will turn blue when it is muted.

Editing Parameters

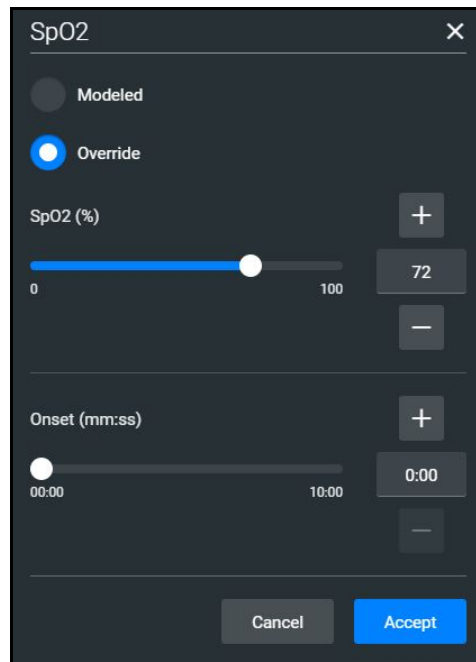
You can edit parameters in one of two ways:

- Parameter Editor
- Quick Edit

To edit a parameter in the Parameter Editor controls:

1. Tap on a waveform or vital sign widget to open the Parameter Editor controls.
2. Tap on the radio button to Override.

3. Use the sliders, text fields, or (+) and (-) to adjust parameters.

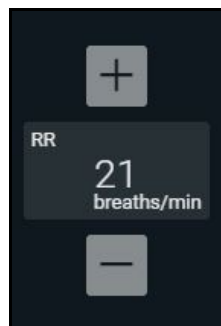


Parameter Editor Controls

4. Tap **Accept**.

To edit a parameter using Quick Edit:

1. Tap and hold a waveform or vital sign widget until (+) and (-) icons appear over the widget.



Plus/Minus Widget

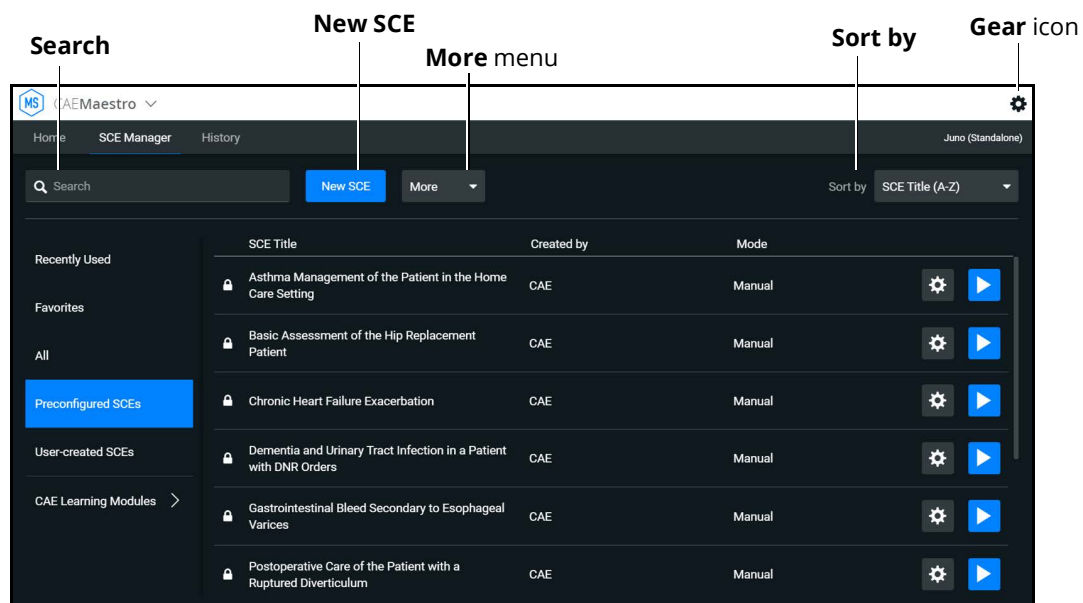
2. Tap the (+) or (-) signs to adjust the parameter.
3. Tap outside of the Quick Edit area to save the changes and close the editor.

Panels, accessed from the Run screen, allow the application of conditions, medications and treatments during simulation. Once applied, changes are reflected in the patient's physiology and logged.

MANAGING SCEs

The Maestro SCE Manager is where you can view and print information for all SCEs. You can also create, edit, copy, or delete custom SCEs and Learning Modules.

To access the SCE Manager screen, from the Maestro Home Screen click **SCE Manager**.



SCE Manager Screen

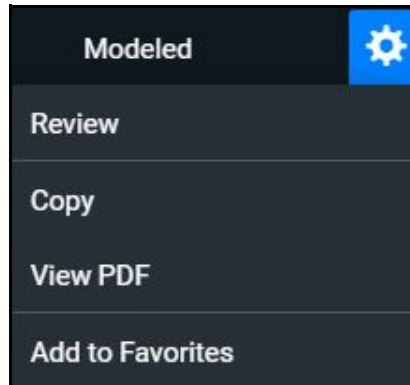
The default screen shows Recently Used SCEs but you can easily locate any SCE and Module in the SCE Manager.

There are three ways to locate SCEs or modules from the SCE Manager screen:

- In the left column, select either **Favorites, All, Preconfigured SCEs, User-created SCEs** or **User-created Modules**.
- In the **Search** field, type part or all of the name of an SCE or module.
- Tap the **Sort by** drop-down to filter the list by ascending or descending order.

Review an SCE

To review details about an SCE, tap the name of an SCE, or tap the **Gear** icon and select **Review** from the drop-down menu.



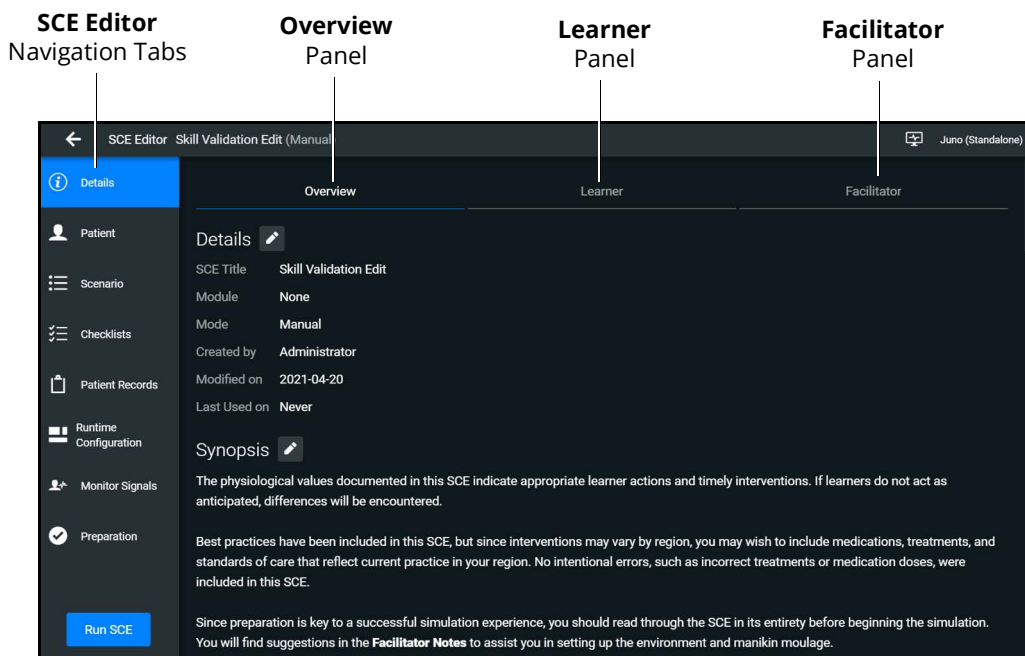
SCE Gear Drop-down Menu Options

The SCE Editor screen appears.

View SCE Details

From the SCE Editor screen, you can select a tab or panel to view details.

The SCE Editor screen is where users can enter specific details for custom SCEs. For more information on entering SCE details into a new SCE, see *Create a Custom SCE* section of this user guide.



SCE Editor Screen - Overview Panel

SCE Editor Navigation Tabs

- **Details:** Lists relevant information about the SCE. Allows access to the Overview, Learner, and Facilitator panels

For more information, see *SCE Editor Panels*.

- **Patient:** Includes the patient profile information
- **Scenario:** Includes states pertaining to the SCE
- **Checklists:** Includes checklists related to learner milestones for the SCE
- **Patient Records:** Stores patient records including but not limited to:
 - Lab reports
 - X-rays
 - Medical history
 - Healthcare Provider's orders
 - Handoff reports
- **Runtime Configuration:** Allows the creation of Quicklinks for conditions, medications, and treatments
- **Monitor Signals:** Allows users to enable or disable parameters to be displayed on the patient monitor at the start of the scenario
- **Preparation:** Lists recommended equipment and supplies needed to run the SCE and manikin setup notes

SCE Editor Panels

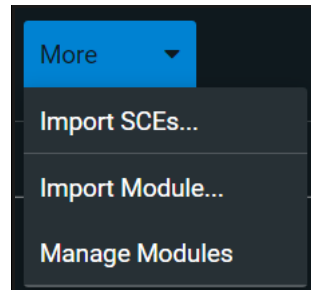
- **Overview:** Includes information about the SCE synopsis and descriptions of the states
- **Learner:** Displays learning objectives, performance measures for each state, and preparation questions
- **Facilitator:** Includes notes, debriefing points, teaching questions and answers, as well as clinical references about the SCE

Import or Export an SCE

SCEs can be imported from an external device or the hard disk drive where the SCE file is saved. The SCE file extension is *msce*.

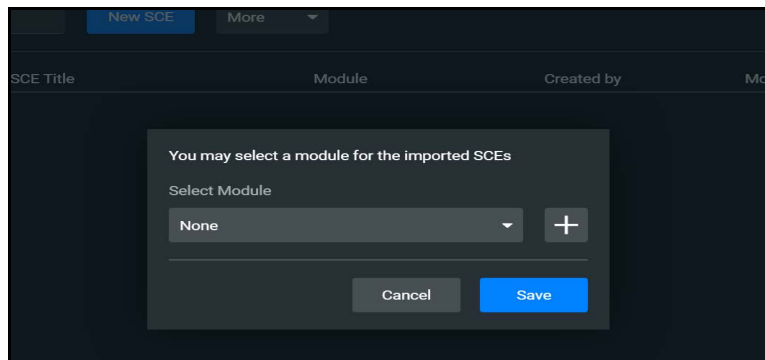
To import from the SCE Manager screen:

1. Tap the **More** drop-down menu and tap **Import SCEs**.



More Drop-down Menu Options

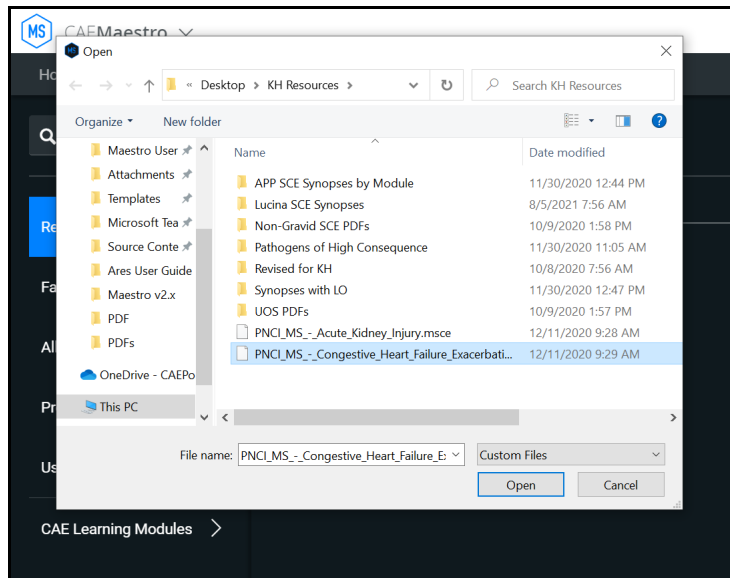
A window opens with the option to add the SCE to an existing learning module.



Module Selection Window

2. Choose a module from the drop-down list, or choose **None**.
3. Tap **Save**.

The file explorer window opens.

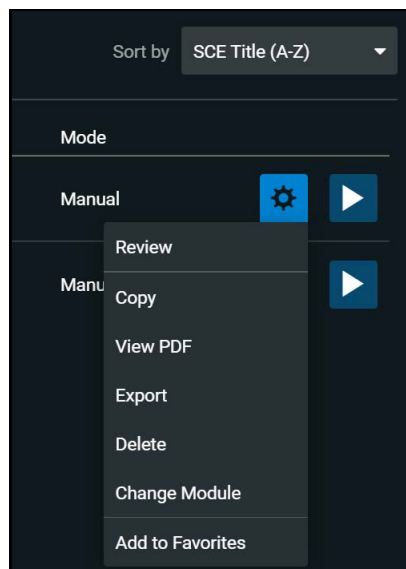


File Explorer Window

4. Choose the SCE file to import and tap **Open**.

To export an SCE:

1. In the **SCE Manager**, tap the gear icon next to the desired SCE to reveal the drop-down menu.



SCE Gear Drop-down Menu Options

2. Tap **Export**.

3. Select the desired location for the *msce* file in your File Explorer window and tap **Save**.

The file is saved in the designated location. If using a tablet, the files can be exported to an external device via USB-C cable.

To view the PDF of an SCE:

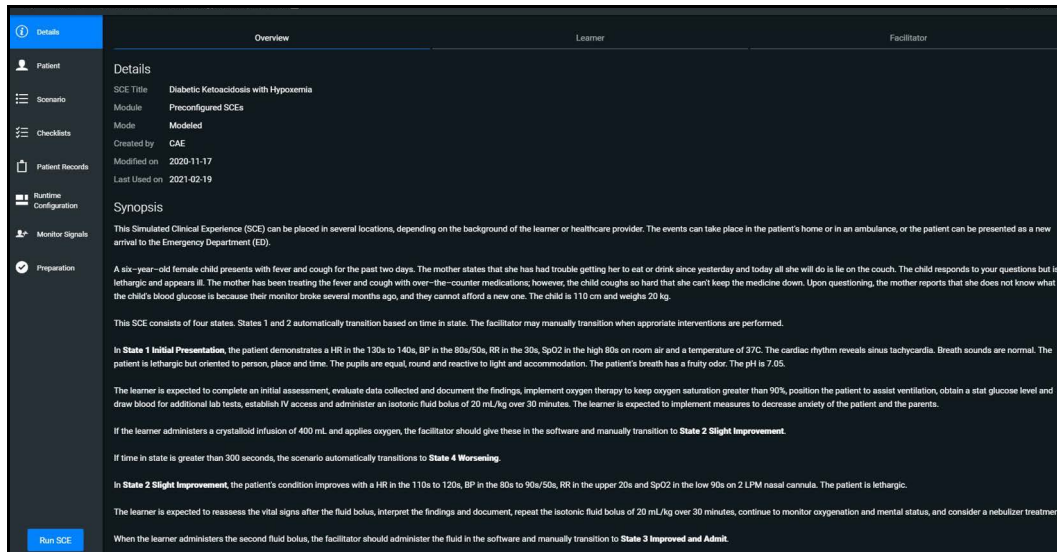
1. Tap **View PDF**.
2. In the window pop-up, identify where the PDF file should be saved to and select **Save**. The file can then be opened and viewed from that location.

If using a tablet, the files can be exported to an external device via USB-C cable.

USING THE SCE EDITOR

Use the SCE Editor to review or manage any purchased, preconfigured SCEs and to complete or edit information for custom SCEs. From the SCE Editor screen, you can also view checklists and patient records, or delete information as needed.

To access the SCE Editor, tap on the name of an SCE from the SCE Manager screen.



SCE Details

The buttons in the Navigation panel provide options to:

- Run the SCE.
- Edit the patient or scenario.
- Add checklists or patient records.
- Modify the runtime configuration including preparation information.

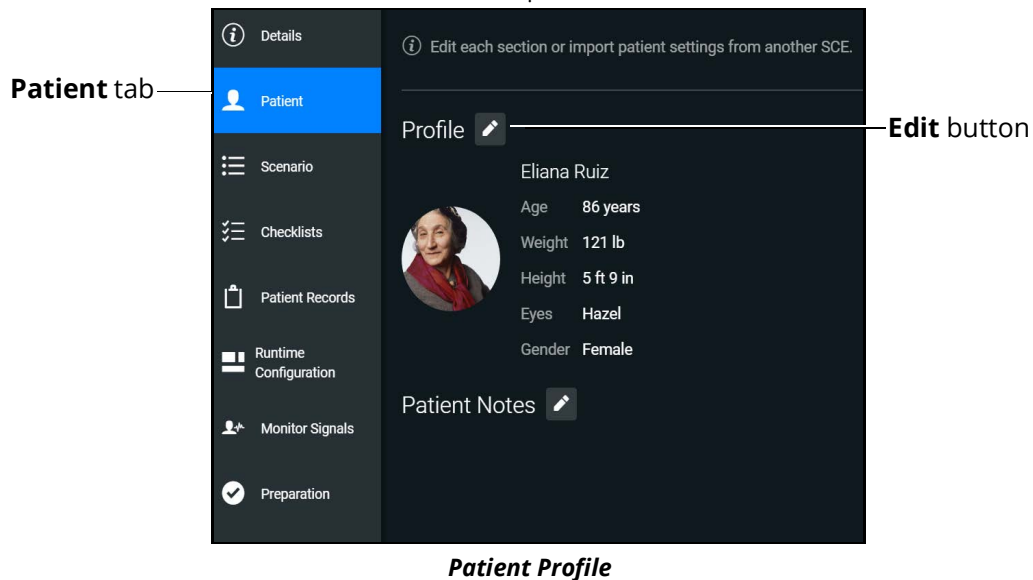
Some sections in the SCE Editor include a rich-text editor to allow free-form data entry.

Note: If the SCE is locked, you cannot modify or delete information.

Patient Profile

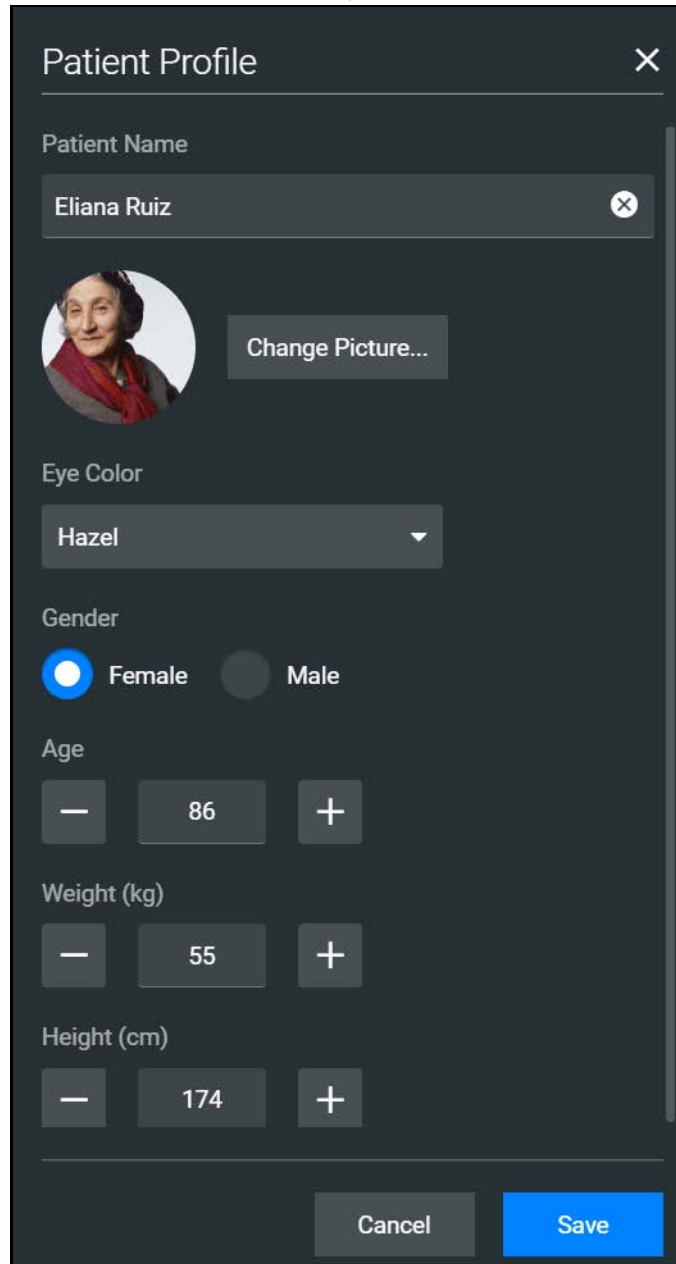
To edit the Patient Profile:

1. From the SCE Editor, tap the **Patient** tab, then tap the **Edit** button.



The Patient Profile Editor appears.


2. Modify the patient's name, eye color, age, gender, weight, and height in the appropriate fields.



Patient Profile ✕

Patient Name

Eliana Ruiz ✕

 Change Picture...

Eye Color

Hazel

Gender

Female Male

Age

— 86 +

Weight (kg)

— 55 +

Height (cm)

— 174 +

Cancel Save

Patient Profile

3. Tap **Change Picture** to change the patient's picture.
4. Tap **Save**.

IMPORTANT: No part of the patient's profile can contain any special characters, such as / \ : * ? < > % | “

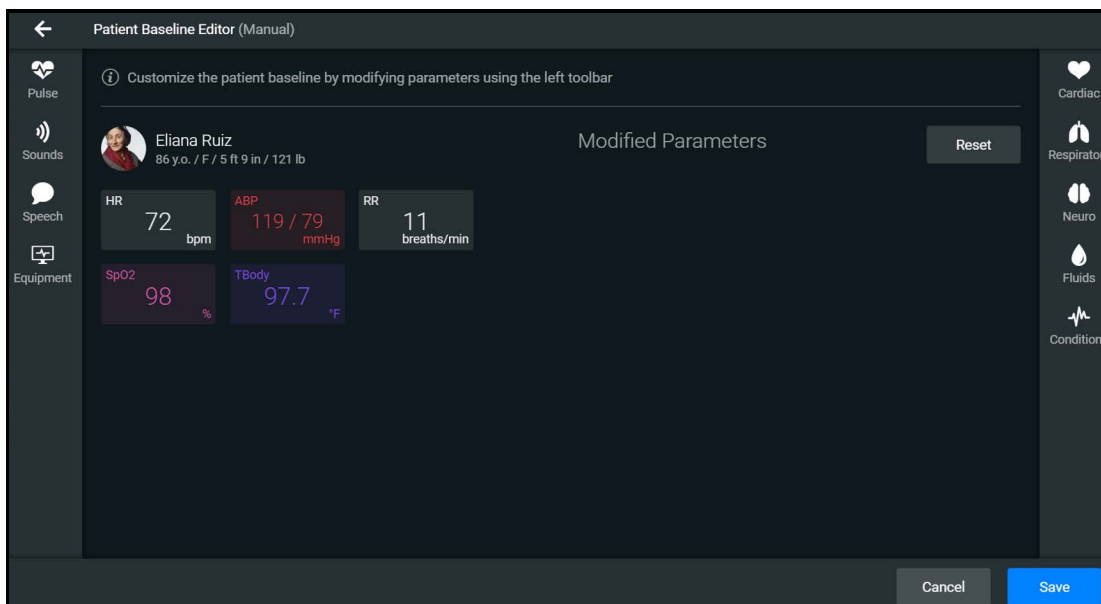
Setting a Patient's Baseline

The patient baseline is the patient's initial status at the start of an SCE.

To set the Patient's Baseline:

1. In the **Patient** section, tap the **Edit** button on the right of **Baseline**.

The Patient Baseline Editor appears.



Patient Baseline Editor

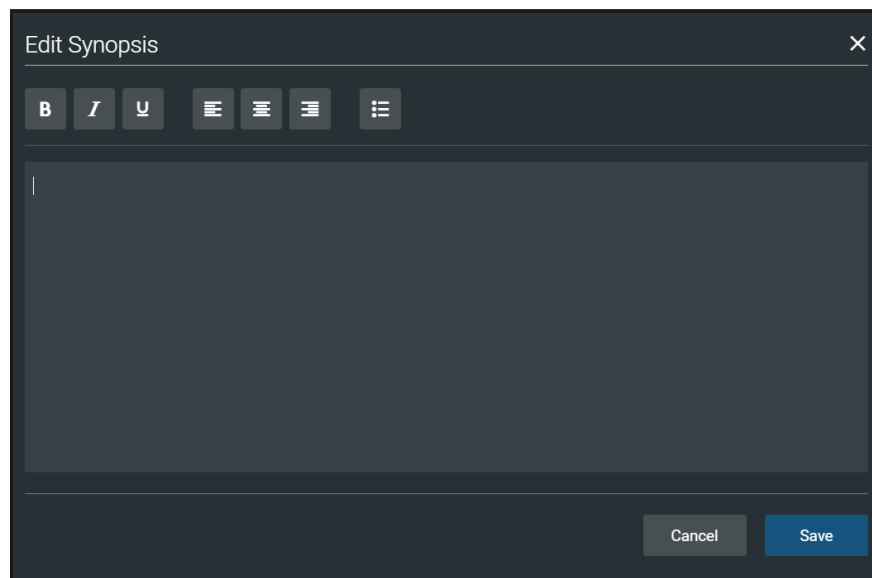
2. Set the Patient's baseline status by modifying the desired parameters and tap **Save**.

When the SCE begins, the Patient status reflects the selected baseline settings.

To use the text editor:

1. Where available, tap the **Edit** button.
2. Enter or edit information as needed.

Note: Text can be copied into the fields from Text Editor or Notepad only.



Text Editor

- When finished, tap **Save**.

Note: Notes can also be added to each scenario state when editing a Scenario.

Scenarios

When creating a custom SCE, users can create new scenarios or modify an existing unlocked SCE using the Scenario Editor or Live Scenario Editor.

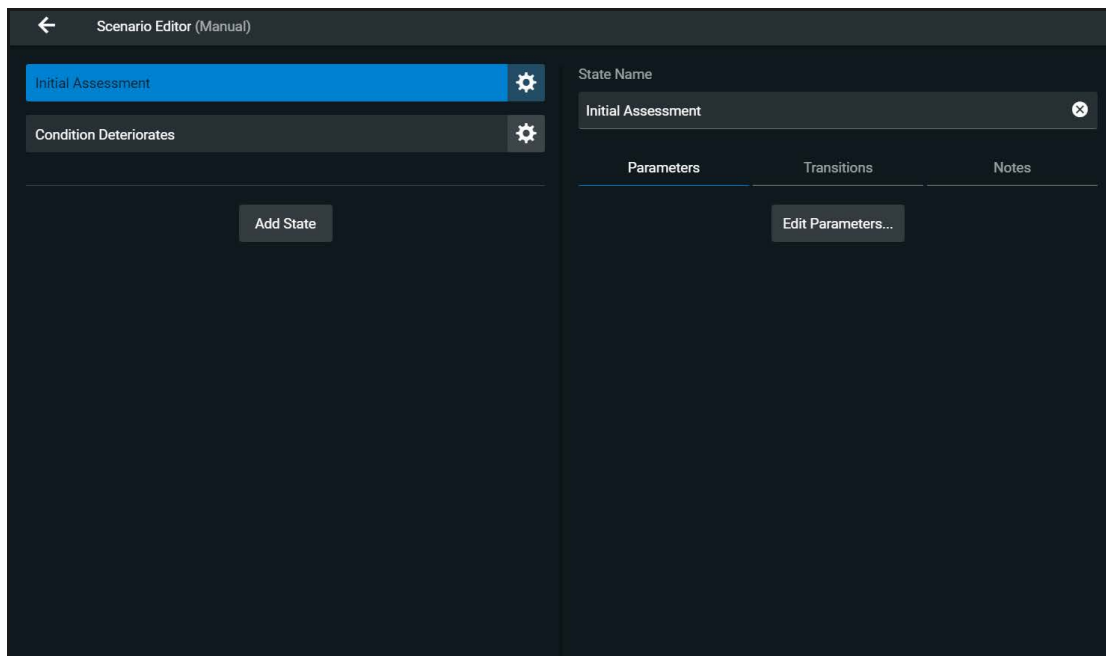
Note: The live editor is only available within unlocked SCEs that use the optional Modeled Physiology, and allows live edits to the scenario while running the simulation.

To edit from the Scenario Editor:

- From the SCE Manager screen, select an SCE to edit.
The SCE Editor screen appears.
- Tap the **Scenario** tab.
- Tap the Scenario **Edit** icon.

Note: If it is a brand new SCE, tap the **Open Scenario Editor** button to open the Scenario Editor.

The Scenario Editor appears.



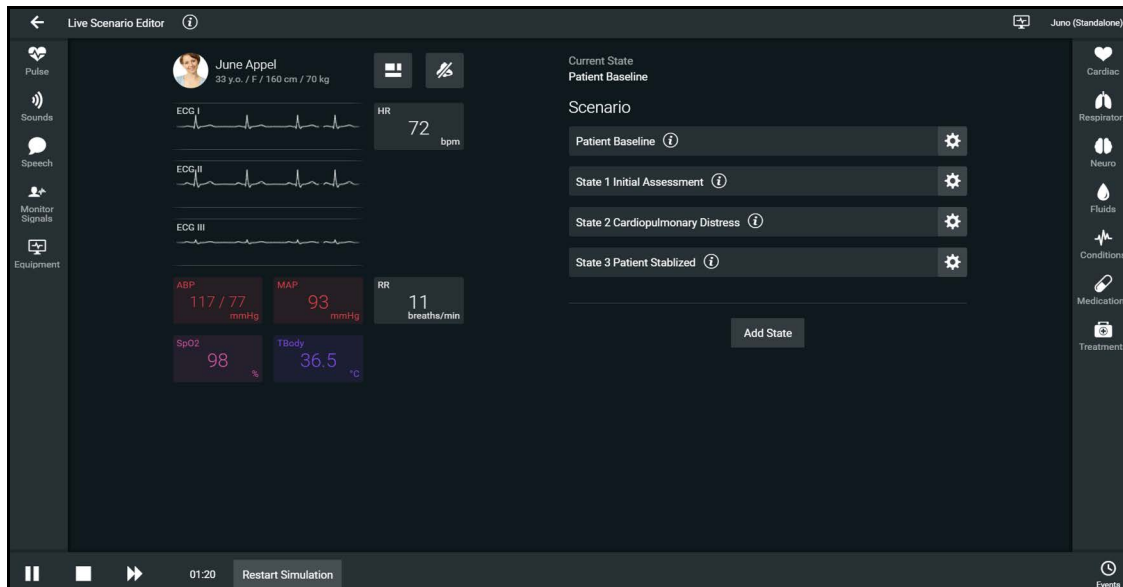
Scenario Editor

4. Tap the **Gear** icon located on the side of a state to do one or more of the following:
 - **Rename:** to rename the state
 - **Copy:** to copy the state
 - **Delete:** to delete the state
 - **Edit Parameters:** to edit the state parameters without jumping to the specified state
 - **Add Transition:** to add a transition from one state to another
 - **Edit Note:** to add state notes

From the Live Scenario Editor, states can be added, modified, and deleted. Patient Profile and other SCE sections can only be modified in the SCE Editor.

To edit from the Live Scenario Editor:

1. From the Scenario Editor screen, tap **Live Scenario Editor**. When the informational window appears, tap **Close** and the Live Scenario Editor screen opens.



Live Scenario Editor

2. Tap the **Gear** icon located on the side of a state. Then tap one or more of the following:
 - **Jump to State:** allows users to jump to the desired state. It is possible to perform a live edit, by selecting the **Edit Live** button. Once completed, parameter changes will be applied to the state. This option allows users to edit state parameters and see the resulting physiological impact on the patient.
 - **Rename:** to rename the state.
 - **Copy:** to copy the state.
 - **Delete:** to delete the state.
 - **Edit Parameters:** to edit the state parameters without jumping to the specified state.
 - **Add Transition:** allows transitions to be added from one state to another.
 - **Edit Note:** to add state notes.

At any time, the simulation may be restarted by tapping the **Restart Simulation** button at the bottom of the screen.

Add, Modify or Delete Scenario States

A scenario state is comprised of conditions and/or parameters. A state may also include automated transitions to other states and notes for the instructor.

For scenarios, users can:

- Create new states and options.
- Add conditions and/or parameters to a state, or copy a state into a new state.
- Modify or delete portions of a state such as conditions, parameters, transitions, or the entire state itself.
- Add and delete transitions.

Add Scenario States and Parameters

You can add states, conditions, and parameters in the Scenario Editor or Live Scenario Editor.

To add a scenario state:

1. In the Scenario Editor or Live Scenario Editor, tap **Add State**.
2. In the window that appears, enter a name for the new state. Tap **Create**.

The State window appears, where you can add parameters to the state.



New State

To add parameters in the Live Scenario Editor:

1. In the Live Scenario Editor, select the desired state, and then select **Jump to State**. All changes made to controls will be added to active state.
2. Tap the **Gear** icon and select **Edit Live**.
3. Add as many parameters as needed.

Parameters appear consecutively within the state.

4. Move to different states to add or edit parameters as needed using the **Jump to State** feature. Repeat this step as needed through multiple states.
5. When finished, tap **Return** to save and exit the editor.

IMPORTANT: If the physiology of any parameter conflicts with other parameters, Maestro will retain the last parameter entered.

To add parameters in the Scenario Editor:

1. In the Scenario Editor, select the desired state.
2. On the right side of the screen, tap **Edit Parameters**.
3. Add conditions or parameters as needed by selecting them from the list on the left side of the screen. Once added, they appear on the right side of the screen.

Modify or Delete Scenario States or Parameters

To modify a scenario state:

1. In the Scenario Editor or Live Scenario Editor, select the desired scenario state. Then, tap **Edit Parameters**.
2. Make necessary changes. Tap **Save**.

To delete a scenario state in the Scenario Editor or Live Editor, tap the **Gear** icon, then tap **Delete**.

To delete parameters:

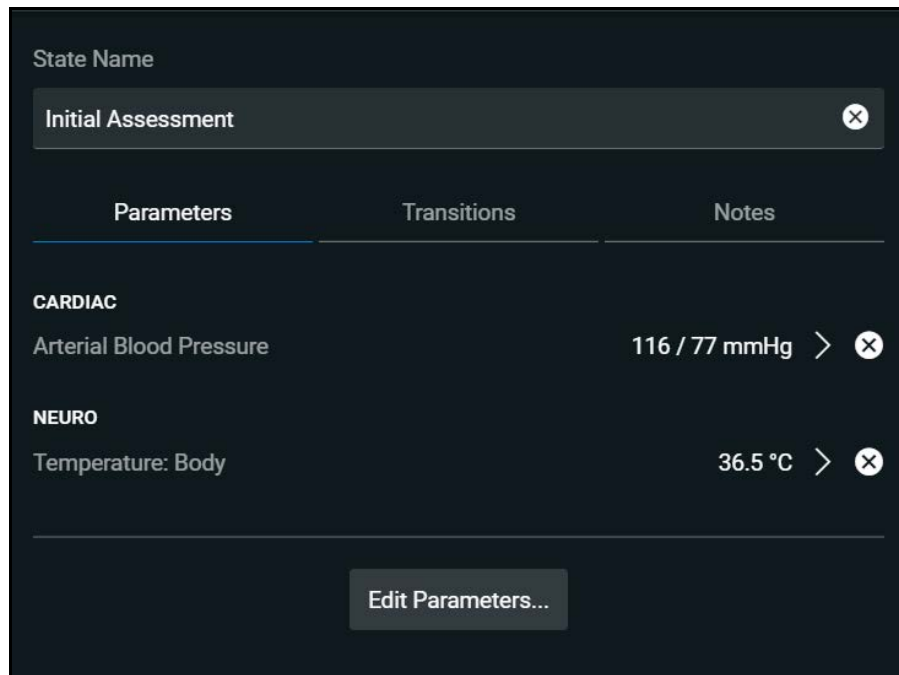
1. In the Scenario Editor or Live Scenario Editor, tap the **Information** icon to expand the state.



Information Icon

2. Tap the **Parameters** tab. Tap the **X** icon next to the parameter to delete.

3. Tap **Save**.



Parameters Tab

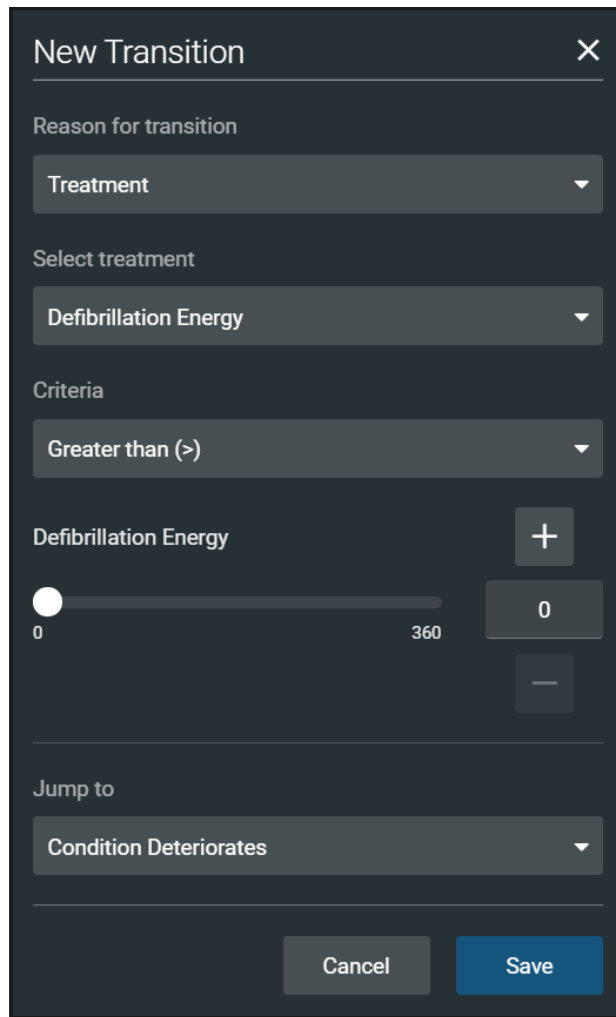
Add and Delete Transitions

To add transitions, the scenario must have both an original state and a state that results from the transition. Add or delete transitions from the Scenario Editor or Live Scenario Editor.

To add transitions:

1. In the Scenario Editor or Live Scenario Editor, tap the **Gear** icon next to the desired state.
2. Tap **Add Transition**.

The New Transition panel appears.



New Transition Panel

3. Select a Reason for Transition from the list, then select additional options as prompted.

Example: If the administration of medication is the desired reason for transition, select Medications, then select the desired medication from the list that appears.
4. Once the transition option is selected (ex: Medication), enter the criteria, transition value, and state that results from the transition.
5. Multiple transitions may be entered for a state to create alternate pathways. Follow the same steps to make selections and assign values to the Treatment, Assessment, Vitals, Medication concentration, Fluids, Time in Scenario, and Time in State variable types.
6. When finished, tap **Save**.

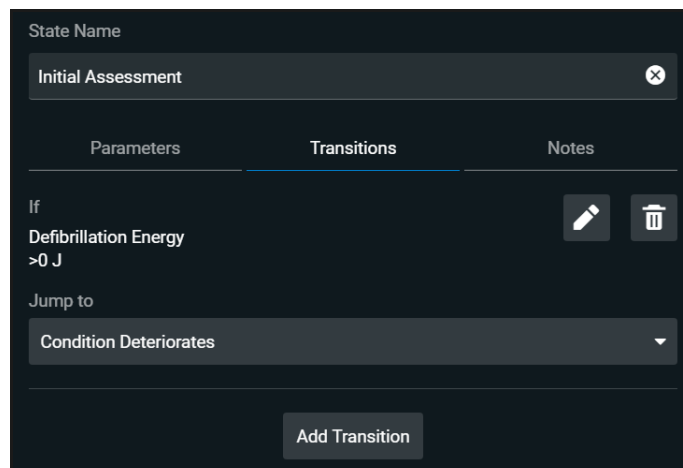
To delete a transition in the Scenario Editor or Live Scenario Editor:

1. Tap the **Information** icon next to the state.



Information Icon

2. Select the **Transitions** tab, then tap the **Trash** button next to the transition to delete.



Scenario Editor - Transition Tab

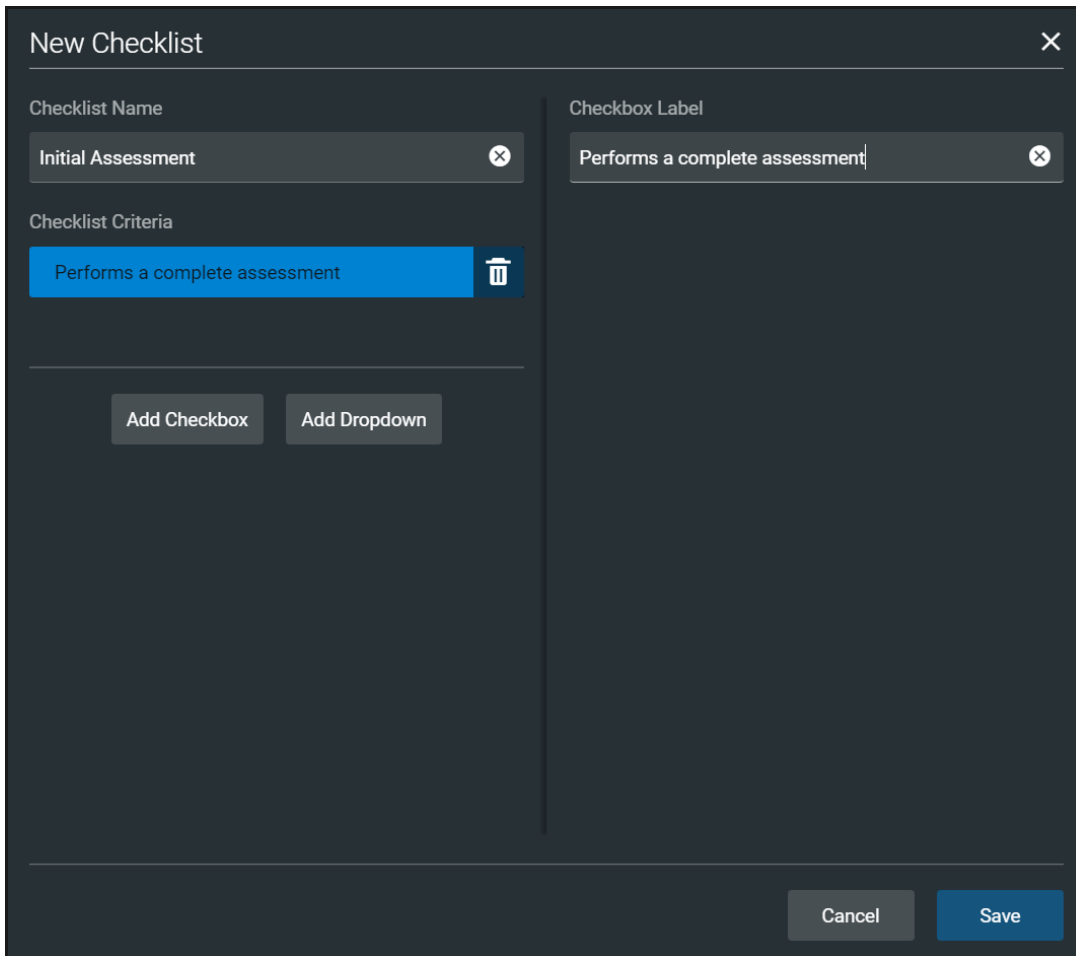
Checklists

You can create new checklists or import existing checklists from the library.

To create a new checklist:

1. In the SCE Editor, tap the **Checklists** tab.
2. When the Checklists panel appears, tap **Create New**.

The New Checklist panel appears.



New Checklist Panel

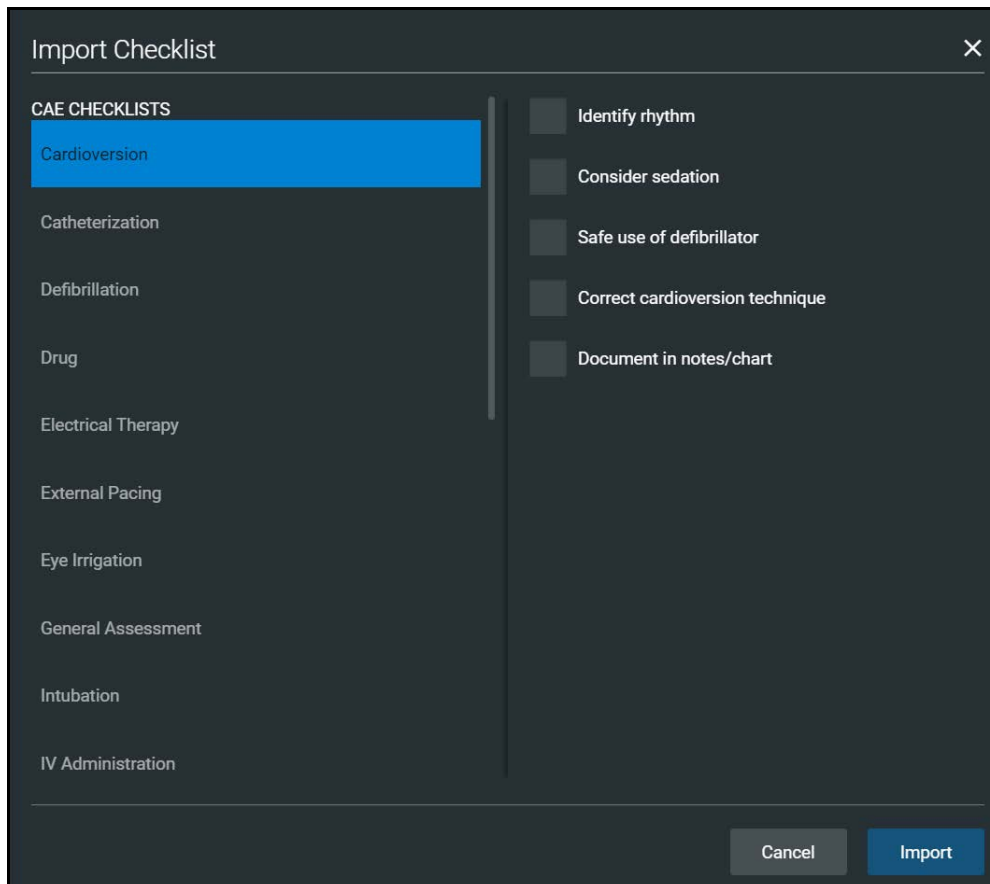
3. Enter a name for the checklist in the Checklist Name field.
4. (Optional) Tap **Add Checkbox** to add a checkbox to the checklist.
 - a. Enter a label name in the Checkbox Label field.
 - b. (Optional) Tap **Add Checkbox** to continue entering labels as needed.
 - c. Tap **Save**.
5. (Optional) Tap **Add Dropdown** to add list items to the checklist.
 - a. Enter a name for the drop-down list in the Dropdown Label field.
 - b. Tap **Add Option** to provide items that can be selected from the drop-down list.
 - c. Enter a name for the list item in the Dropdown Options field.
 - d. (Optional) Tap **Add Dropdown** to continue entering drop-down lists as needed.

- e. Tap **Save**.
6. (Optional) Rearrange the checklist order by dragging individual checklists up or down as desired
7. (Optional) Tap the checklist Gear icon next to the created checklist to Save to Library (or to Rename, Edit, Copy or Delete).
8. (Optional) Use the Edit function to:
 - a. Edit the Checklist Name.
 - b. Edit the Checkbox Label.
 - c. Rearrange the order of the Checklist Criteria by dragging any criteria up or down.
 - d. Add a Checkbox or Dropdown.

To import a checklist:

1. In the SCE Editor, tap the **Checklists** tab.
2. When the Checklists screen appears, tap **Import from Library**.

The Import Checklist panel appears and displays all checklists from all SCEs in the system.



Import Checklist Panel

3. Highlight the checklist.
4. Tap **Import**.

Patient Records

Patient records can be uploaded into Maestro for display in the CAE Patient Monitor software. Once uploaded, a patient record is available for use with the SCE.

Note: A single patient record file cannot exceed 20MB.

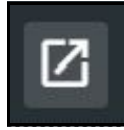
To ensure adequate space, delete patient records that are no longer needed.

To access a patient record:

1. From the SCE Editor screen, tap the **Patient Records** tab.

The Patient Records list appears with all available patient records shown.

- (Optional) To preview a patient record before sending to the Patient Monitor, select the record, and tap the **Preview** button.



Preview Button

- Select a patient record, then tap **Send to Patient Monitor**.

Upload Patient Records

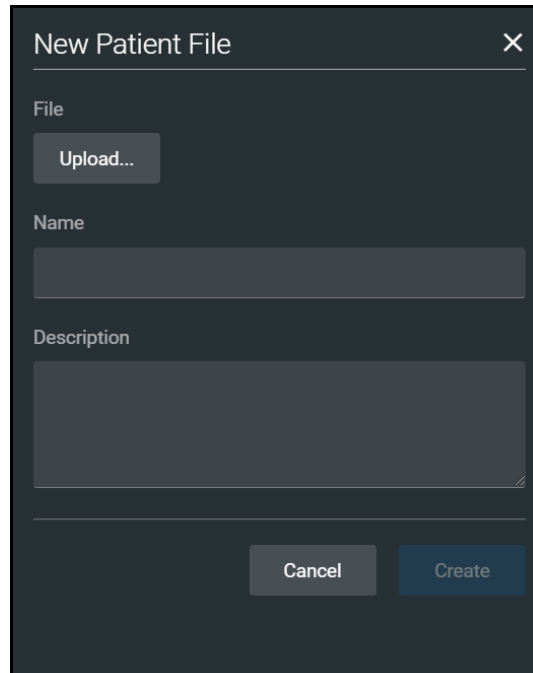
You can upload the following file types:

- GIF, JPG, PNG, and XPS images
- MPEG and MOV videos
- PDF documents
- MP3 audio Files

To upload a patient record:

- In the SCE Editor, tap the **Patient Record** tab.
- In the panel that appears, tap **Patient Files > Add File**.

The New Patient File panel appears.



New Patient File - Upload Panel

3. Tap **Upload**. Select the desired file and tap **Open**.
4. When the file name and description appear, modify as needed in the text fields to reflect the desired file name and description.
5. Tap **Create**.

Edit or Delete Patient Records

You can only change the name or description of the patient record. You cannot edit the content of the record from the Patient Record tab.

To edit a patient record name:

1. From the list of Patient Files, tap the **Gear** icon next to the desired file.
2. Tap **Edit**. Change the **Name** or **Description** as needed.
3. Tap **Save**.

To delete a patient record:

1. From the list of Patient Files, tap the **Gear** icon next to the desired file.
2. Tap **Delete**.
3. When the message appears to confirm your selection, tap **Delete**.

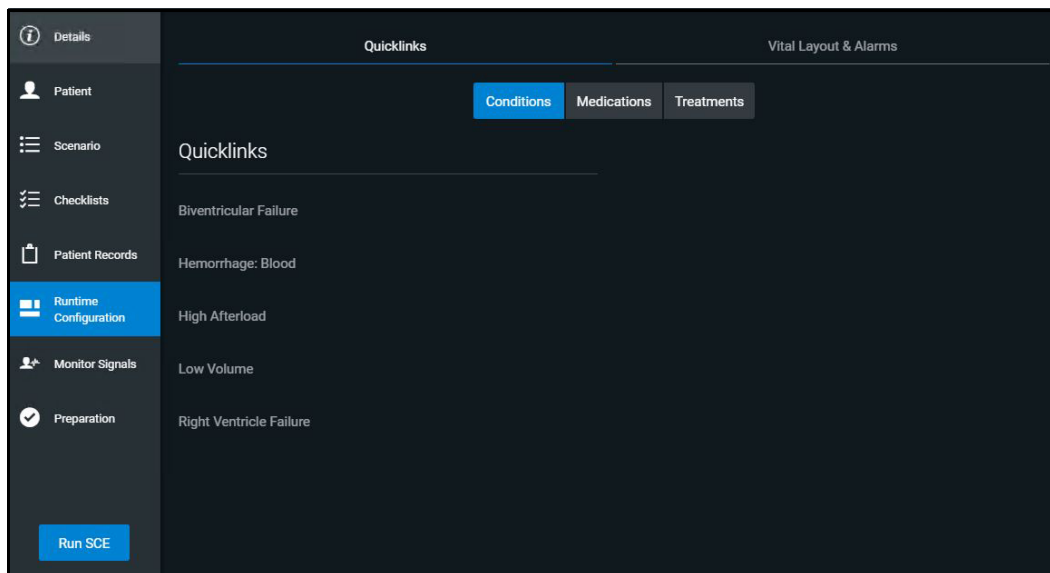
Runtime Configuration

Tap **Runtime Configuration** to access the Quicklinks setup as well as the Vitals Layout & Alarms setup screen.

Quicklinks Setup

From the Quicklinks Setup screen within the SCE Editor, conditions, medications, and treatments can be preconfigured for the SCE by creating Quicklinks. For more information about using Quicklinks, see the *Quicklinks* section of this user guide.

To navigate through available conditions, medications, and treatments, tap the **Conditions**, **Medications** and **Treatments** buttons.



Runtime Configuration Quicklinks Setup Screen

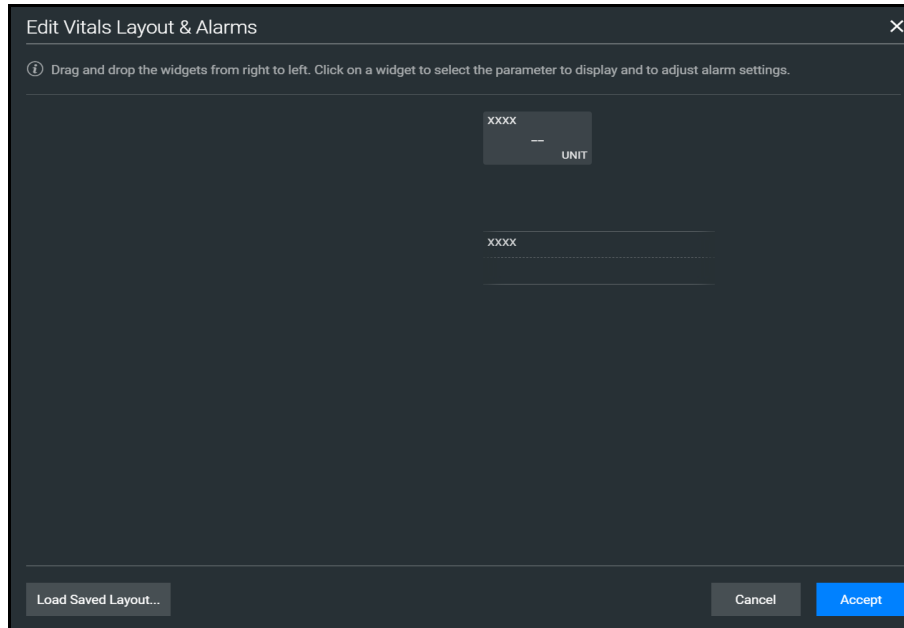
To create a Quicklink, select an item from the **Conditions**, **Medications**, or **Treatments** lists.

To remove a Quicklink, deselect the option.

Edit Vital Layout & Alarms

To edit the vital layout and alarms, tap the **Vital Layout & Alarms** tab.

Any current vital widgets and alarms appear. If the SCE is new, click the **Edit** button to the right of **Vital Layouts & Alarms** and begin adding vital widgets and alarms by dragging the desired widget template from the right side of the screen to the left.



Runtime Configuration Vital Layout & Alarms Screen

Upon dragging the widget, the Select Numeric Widget or Select Waveform box will appear. Select the desired vital or waveform from the available options, modify alarms and thresholds as desired, and tap **Save** when complete.

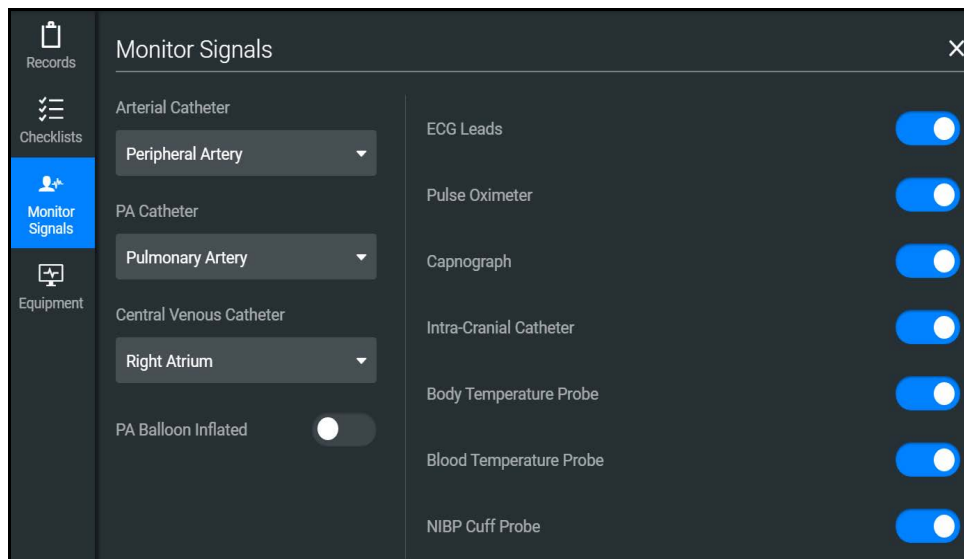
The option to load a saved layout is also available by selecting the **Load Saved Layout** button.

When all modifications are complete, select **Accept**.

Monitor Signals

The Monitor Signals can be modified on the run screen or on the SCE Editor screen. To modify the presence of different vitals and alarms on the patient monitor, select the **Monitor Signals** tab.

The **Patient Monitor** options are displayed by default.



Monitor Signals Screen

Preparation

From the Preparation tab, users can create a list of equipment and supplies, or notes about preparing the manikin for the SCE.

To create a list preparation items:

1. From the SCE Editor, tap the **Preparation** tab. Tap either **Equipment & Supplies** or **Manikin Setup**.
2. Tap the **Edit** button and enter items.
3. Tap **Save**.

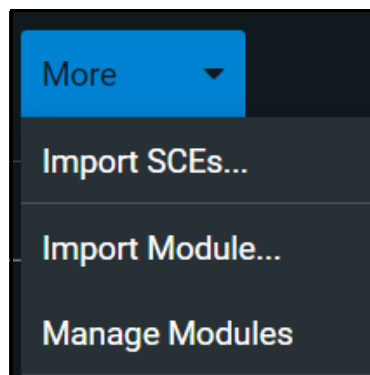
LEARNING MODULES

Learning Modules are comprised of multiple SCEs. You can import or delete existing Learning Modules, or create new Learning Modules in Maestro.

Import a Learning Module

To import a learning module in Maestro:

1. From the SCE Manager screen, tap **More > Import Module**.



More Button

2. Locate the correct learning module file on the local or external storage where the learning module is located. The file extension is ***mlm***.
3. Select the file. Tap **Open**.

Create a Learning Module

To create a Learning Module:

1. From the SCE Manager screen, tap **New SCE**.

The New SCE panel appears.

New SCE

SCE Title

Select Module

None

Created by

Administrator

Mode

Manual Modeled

Patient Name

Patient Gender

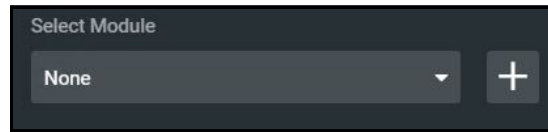
Female Male

Cancel Create

New SCE Panel

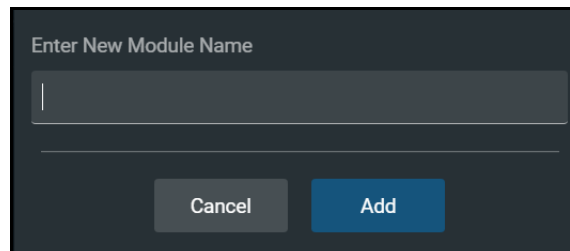
2. Type a title for the SCE in the **SCE Title** field.

3. To select a module to add the SCE to, tap the drop-down arrow, then select a module or tap the + icon to create a new module.



Select Module

- If creating a new module, type a name for it in the Enter New Module Name window. Then, tap **Add**.



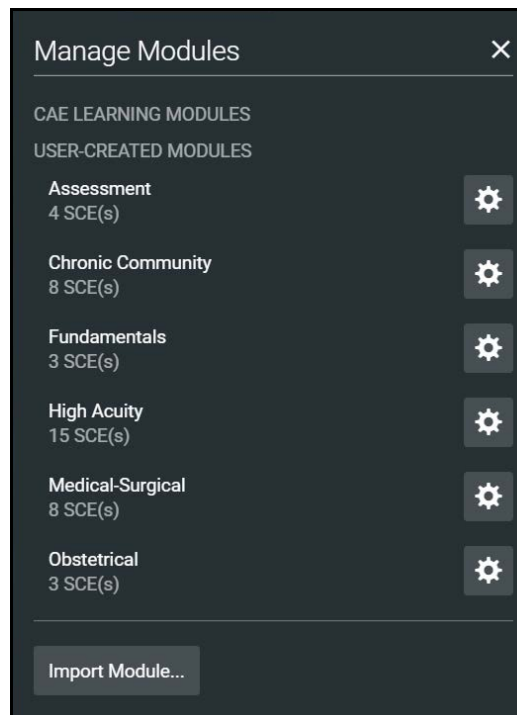
New Module Name Screen

4. Complete the remaining fields on the New SCE window or select options as required.
5. Tap **Create**.

Delete a Learning Module

To delete a Learning Module from Maestro:

1. From the SCE Manager screen, tap **More > Manage Modules**.



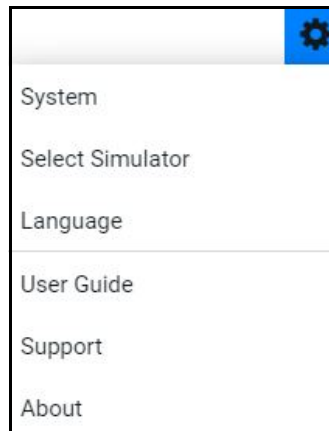
Example of Manage Modules Panel

2. Tap the **Gear** icon next to the module you want to delete.
3. Select **Delete** from the dropdown list.
4. When the message appears for you to confirm your selection, tap **Delete All**. All of the SCEs in the learning module will be deleted.

CAUTION: This action cannot be undone.

ADMINISTRATIVE TOOLS

The Maestro software includes administrative tools to access and manage system settings, preferences, and additional information such as historical data about simulation sessions.



Administrative Tools

Access administrative tools via the **Gear** icon located on the upper-right corner of the Maestro screen.



Gear Icon

Select one or more of the following to access system settings:

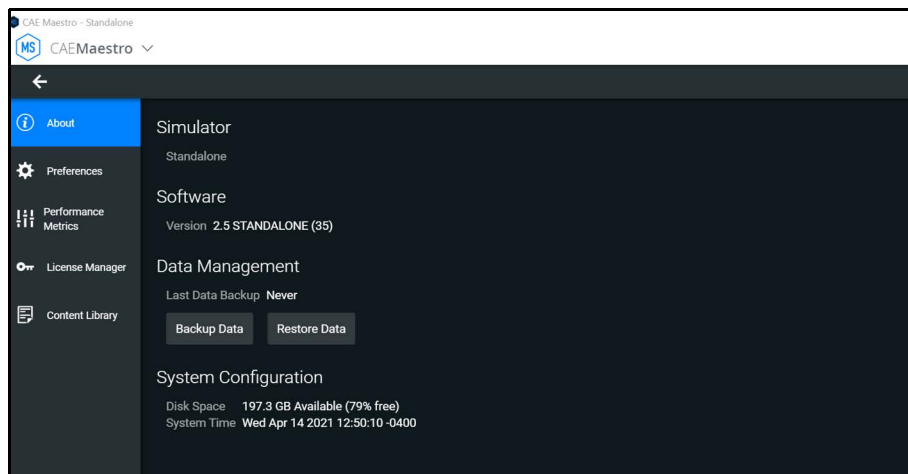
- **System:** Access information about the type of simulator, the Maestro software version, the type of simulator, Data Management, System Configuration, Preferences, Performance Metrics, License Manager, and Content Library.
- **Select Simulator:** Change the simulator (only available when using Maestro Standalone)
- **Language:** Change the Maestro language
- **User Guide:** Access the user guide (English version). Go to: www.caehealthcare.com and click the **Support** link
- **Support:** Access CAE Support contact information
- **About:** Access information about the CAE Maestro software version, the type of simulator and the serial number.

System Administration

From the System Administration screen, you can access system information, set preferences, and manage licenses and performance metrics for CAE Maestro.

System Information and Settings

To access the System Settings, from the Home screen, tap the **Gear** icon. Then select **System**.



System Administration

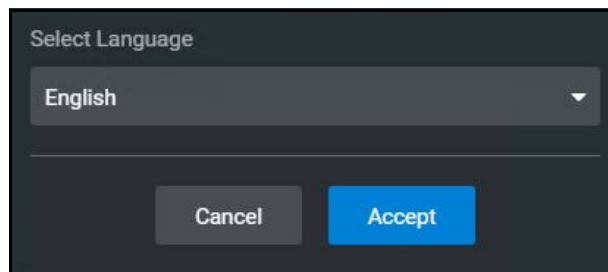
From this screen, you can select:

- **About:** to view software version and system configuration
 - Under Data Management, you can backup and restore data through the **Backup Data** and **Restore Data** buttons respectively.
 - CAUTION:** Restoring data permanently replaces all current data on the device.
- **Preferences:** to change settings to different software features
 - **General Preferences:** to adjust language, sweeper speed, units of measure (metric or imperial), pressure, temperature, energy (electrical therapy), airway pressure, CO2 units, O2 units, Anesthetic Gas Pressure, and color preference
- **Performance Metrics:** to change settings to CPR Training Target Values, including compression rate, compression depth, and ventilation volume
- **License Manager:** to access license information (from here, you can start a trial of the Maestro software, and activate or deactivate the license)
- **Content Library:** to access and create new Patient Files and Custom Speech Files

Set the Default System Language

To set Maestro's language:

1. From the Home screen, tap the **Gear** icon and from the drop-down menu, select Language.



Select Language Window

2. Select the desired language from the drop-down menu.
3. Tap **Accept**.

Note: Language can also be set from **System > Preferences**.

Additional Administrative Tools

You can access the CAE Maestro User Guide, support information, or system information.

From the Home screen, tap the **Gear** icon, then select one of the following:

- **User Guide:** to download the English-language user guide (Go to: www.caehealthcare.com and click the **Support** link)
- **Support:** for CAE Support contact information
- **About:** to access information about the CAE Maestro software version, the type of simulator, and the serial number

SCE Management

The SCEs in Maestro are managed in the SCE Manager screen. For more information on managing and modifying settings of the SCEs using the SCE Manager, see *Using Maestro* section of this user guide.

Session History - History Screen

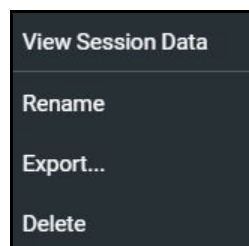
The History screen displays a log of simulation event data.

Start Time	Duration	Simulator	Session Name	SCE Title
2019-12-30 11:46	0min	Standalone	Juno session	Running on the Fly (Modeled)
2019-12-27 12:54	0min	Standalone	Juno session	Skills Assessment (Manual)
2019-12-27 12:49	0min	Standalone	Juno session	Running on the Fly (Modeled)
2019-12-27 12:49	0min	Standalone	Juno session	Running on the Fly (Manual)
2019-12-27 12:47	1min	Standalone	Juno session	Skill Validation (Manual)
2019-12-27 12:47	0min	Standalone	Juno session	Skills Assessment (Manual)
2019-12-23 16:31	0min	Standalone	Juno session	Running on the Fly (Manual)

History Screen

To view session data:

1. Tap the **History** tab.
2. Tap the **Gear** icon for the desired simulation session, then select **View Session Data**.



History Log Options

The Event Log, Physiological Data, and Checklists appear. Tap the Physiological Data for a session to view all physiological data that occurred during the SCE.

You can export data to a CSV or MSS file (session file in Maestro format) and store it on an external device.

To export data from the History screen, tap the **Gear** icon for the desired simulation session, then tap **Export**.

USING THE CAE PATIENT MONITOR

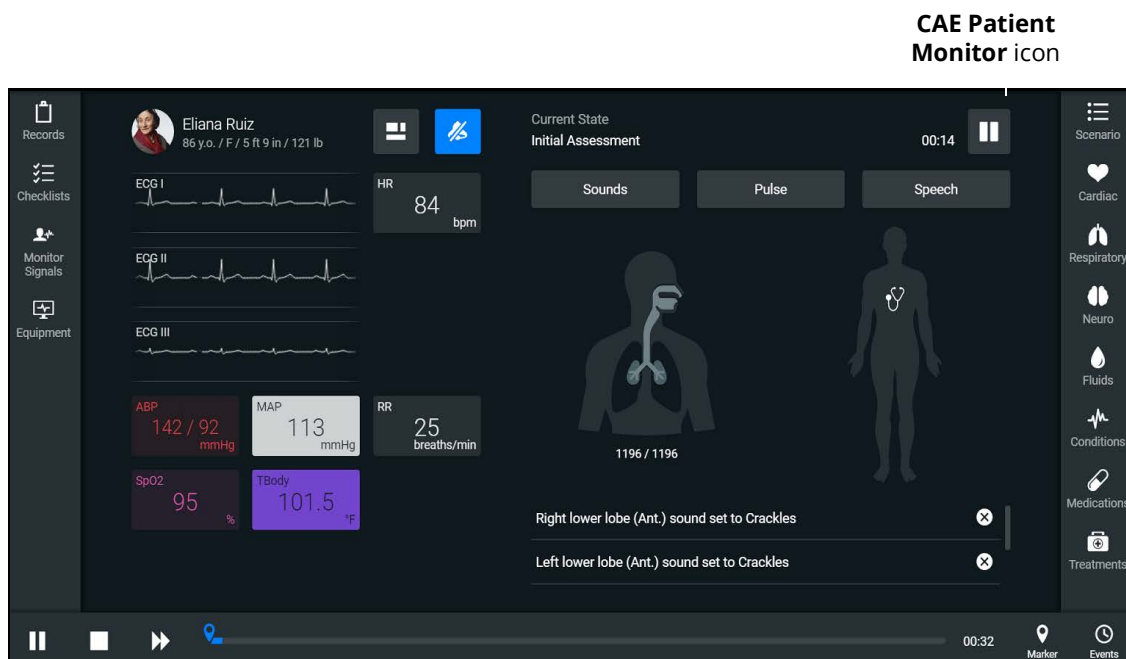
CAE's Patient Monitor is one of the many types of equipment applications that CAE offers to enhance the simulation learning experience. The patient monitor emulates a typical bedside monitor and allows you to view the patient's physiology expressed in waveforms and numeric values. In this User Guide, information is provided to access and configure the Patient Monitor software.

The software can be launched from the CAE Maestro Instructor Tablet, or another computing device, provided it has joined the simulator's wireless network and meets the minimum system requirements. Refer to the *System Requirements* section of this User Guide.

Accessing the Patient Monitor

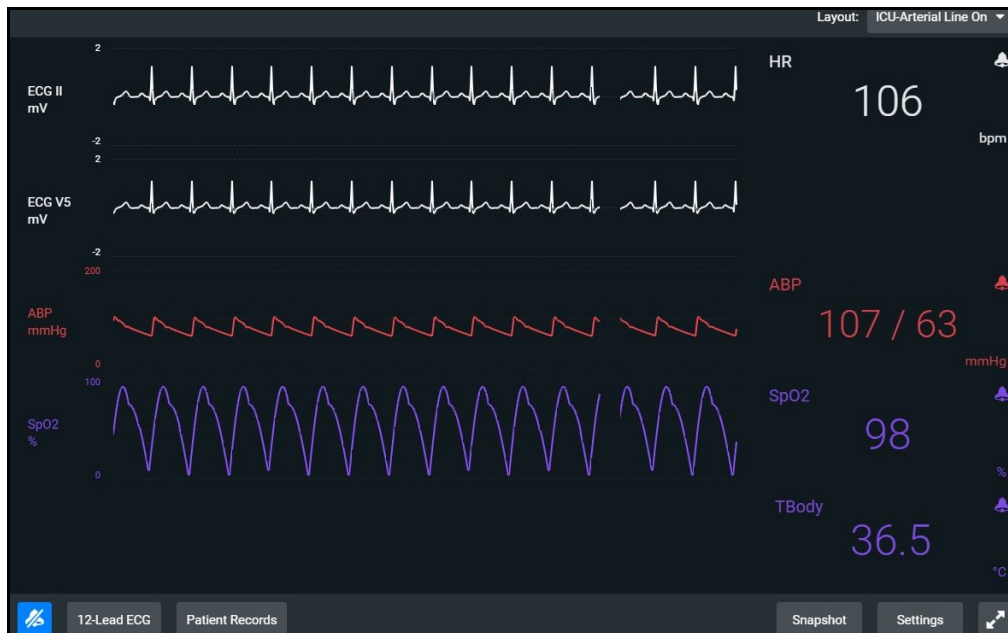
To launch Patient Monitor from the Instructor Tablet:

1. With an SCE running, select the **CAE Patient Monitor** icon in the upper-right corner of the SCE Run screen.



SCE Run Screen - CAE Patient Monitor Icon

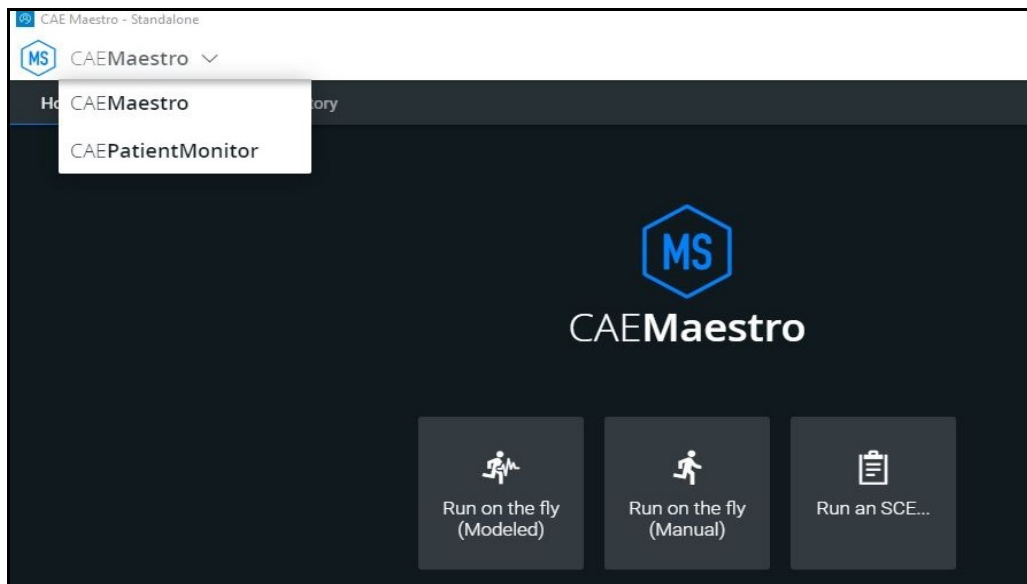
The patient monitor screen appears.



CAE Patient Monitor

- The CAE Patient Monitor can also be accessed from the CAE Maestro Home screen. Tap the CAE Maestro Application drop-down menu in the upper-left corner of the screen and select **CAEPatient Monitor**.

Note: An SCE must be running in the Maestro software for any physiological data to appear on the monitor. The CAE Patient Monitor can only show one patient at a time.



CAE Maestro Application Drop-down Menu

Select a Preconfigured Layout

The following are the preconfigured CAE Healthcare Layouts for the patient simulator:

- **ICU-Arterial Line Only** - preconfigured with waveform and numeric readouts for ECG Lead II, ECG Lead V, ABP, Pleth, and a numeric readout for Body Temperature
- **EMS-ED-Telemetry** - preconfigured with waveform and numeric readout for ECG Lead II and numeric readouts for SpO₂, and Non-Invasive Blood Pressure (NIBP)
- **ICU-OR No CVP** - preconfigured with waveform and numeric readouts for ECG Lead II, ECG Lead V, ABP, PAP and Pleth, and numeric readouts for NIBP, Blood Temperature, and Body Temperature
- **ICU-OR** - preconfigured with waveform and numeric readouts for ECG Lead II, ECG Lead V, ABP, PAP, CVP and Pleth, and numeric readouts for NIBP, Blood Temperature, and Body Temperature
- **Saturation-Pulse** - preconfigured with numeric readouts for SpO₂ and pulse

To select a preconfigured layout:

1. Tap the **Layout** drop-down menu in the upper-right corner of screen.



CAE Patient Monitor Layout Dropdown Menu

The Layout menu appears.

2. Select a desired layout.

Settings

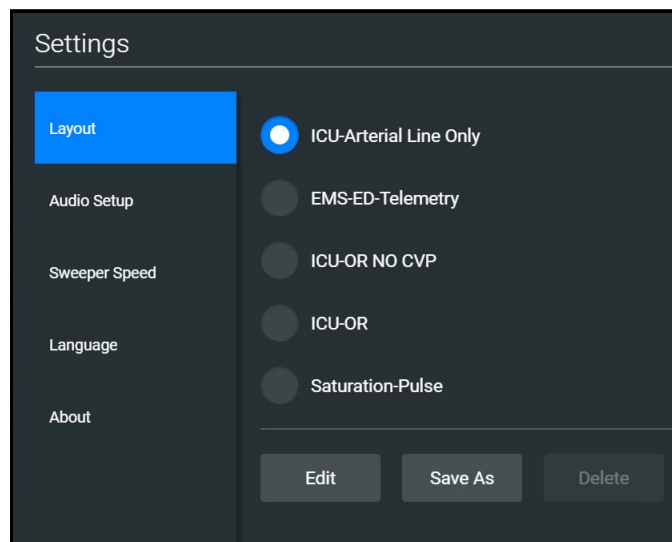
CAE Patient Monitor settings options allow for configuration preferences. The following selections are available on the settings panel:

- Layout - customize specific vital signs, colors, waveforms, numerics and specific location of the parameters on the display
- Audio Setup- specify alarm ranges and suspension times
- Sweeper Speed - adjust intervals from 3 to 60 seconds for sweeper speed
- Language - select preferred language

To access the Settings panel:

1. Tap **Settings** in the lower-right corner of the screen.

The Settings menu appears. The **Layout** tab is displayed by default.

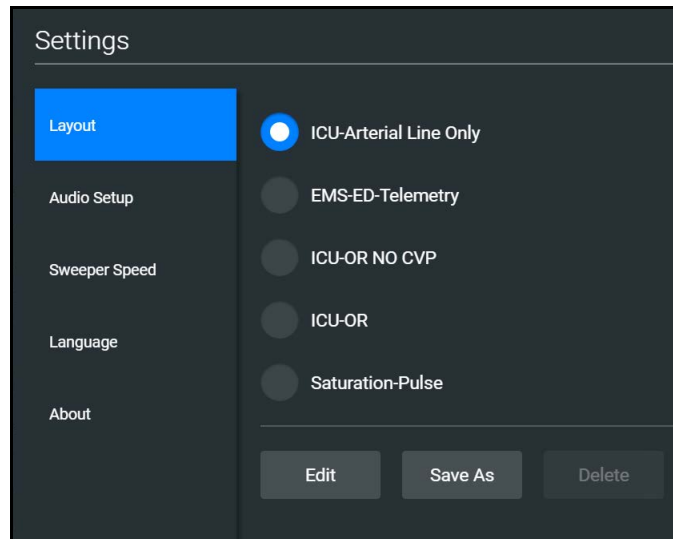


Settings Panel - Layout Options

Layout

To access the Layout options in CAE Patient Monitor:

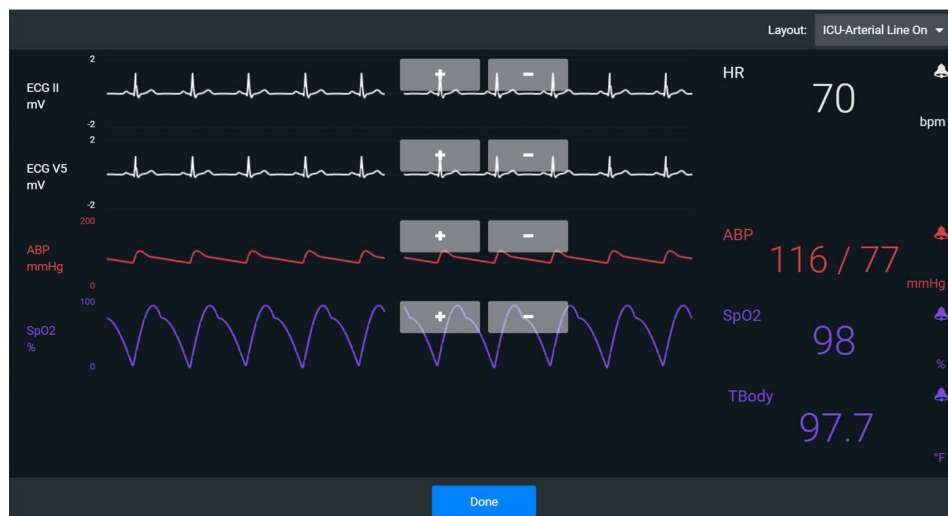
1. Tap the **Settings** tab at the lower-right corner of the Patient Monitor screen. The Layout tab is displayed by default.
2. From the Layout options, select a layout.



Settings Panel - Layout Options

3. Tap **Edit**.

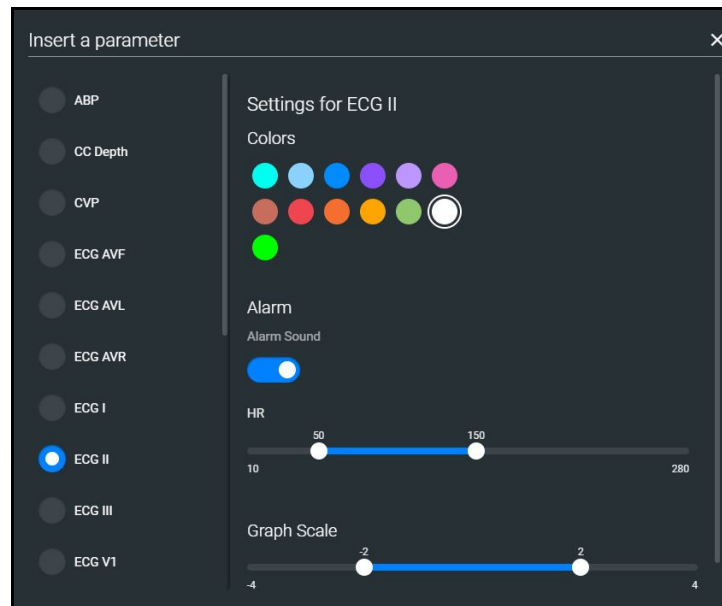
The Layout Edit screen appears.



Layout Edit Screen

4. Select a signal to edit its parameters.

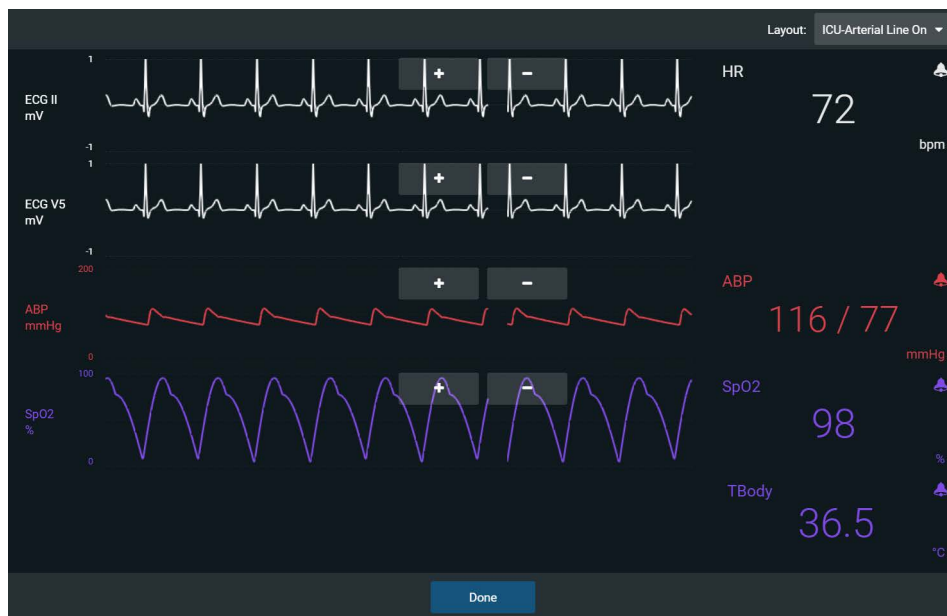
The Insert a parameter screen appears.



Insert a Parameter

5. Adjust the signal's **Color**, **Alarm**, and **Graph Scale** parameters as desired,
OR
Select a parameter to insert it in the place of the selected parameter.
6. When finished, tap the **X** in the upper-right corner to close the panel.

The Layout Edit screen reappears.



Layout Edit Screen

7. Use the plus (+) buttons to add waveforms to the layout.
Patient Monitor adds a line to the Layout.
8. Select the new line to open the Insert a Parameter window.
9. Select the parameter to display on the new line.
10. Set the parameter's **Color** and **Alarms**. When finished, close the parameter panel.
11. Tap **Done** to close the Layout Edit screen.

The Settings Layout panel opens.

12. Tap **Edit** to resume editing the layout.
13. Tap **Save As** to save the layout.
14. Type a name for the layout, then tap **Save**.

NIBP Cycling

Most layouts offer Non-Invasive Blood Pressure (NIBP) cycling options. To select this option within the layout:

1. Tap **NIBP** at the bottom of the Patient Monitor screen.
2. Tap the NIBP Cycling dropdown menu to open.
3. Select a timeframe for automatic cycling of NIBP.



NIBP Cycling Option

Sounds

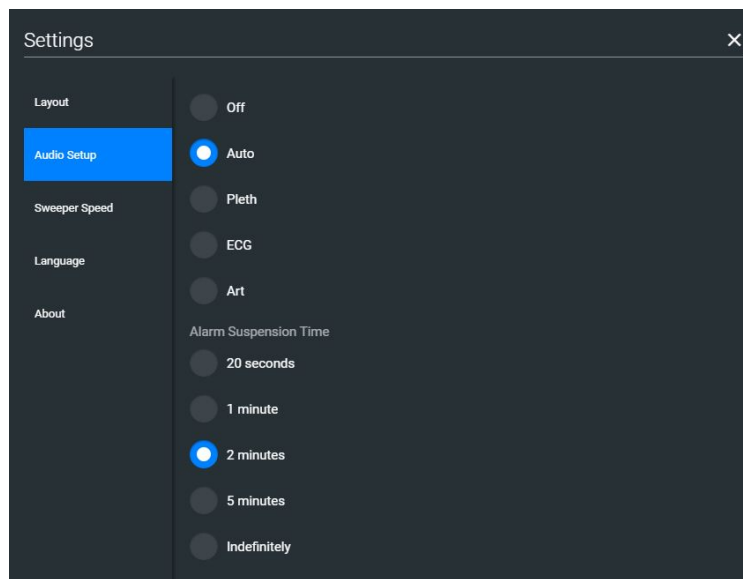
To silence all sounds, tap the **Mute** button in the lower-left corner of the screen.



Mute Button

To set up the audio for Patient Monitor:

1. Tap **Settings** in the lower-right corner of the Patient Monitor screen.
2. From the Settings panel, select the **Audio Setup** tab.



Settings - Audio Setup Options

3. (Optional) Select a waveform to set it as the pulse sound trigger.
4. (Optional) Select an **Alarm Suspension Time** to disable the selected waveform for an indicated amount of time.
5. When finished, tap **X** to close the window.

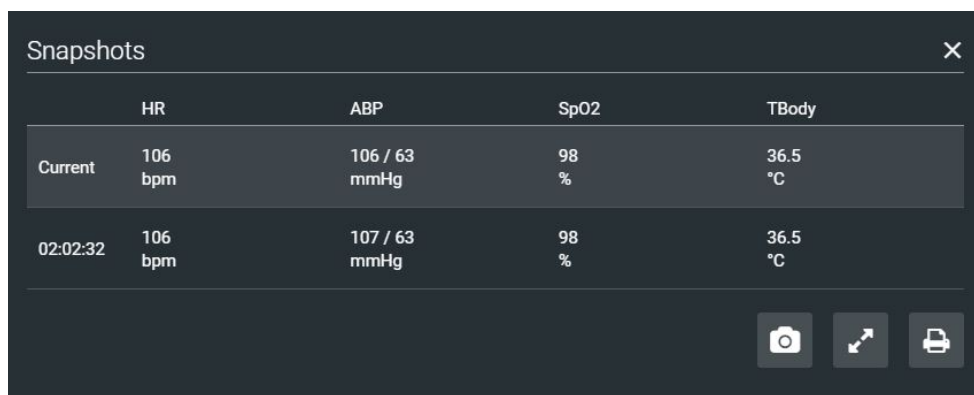
Snapshot

The snapshot tool captures an image of data on the screen, and then provides the ability to save it to a laptop or tablet. This function is unavailable if the device is connected to a wireless network where users cannot print a report.

To capture an image:

1. Tap **Snapshot** at the lower-right corner of the Patient Monitor screen.

The Snapshots window appears showing the live data available to capture.



The screenshot shows a window titled "Snapshots" with a close button (X) in the top right corner. The window contains a table with the following data:

	HR	ABP	SpO2	TBody
Current	106 bpm	106 / 63 mmHg	98 %	36.5 °C
02:02:32	106 bpm	107 / 63 mmHg	98 %	36.5 °C

At the bottom right of the window, there are three icons: a camera icon (Capture Snapshot), a share icon, and a print icon.

Snapshots Window

2. To take another snapshot, tap the **Capture Snapshot** (camera) button at the lower-right corner of the screen.
3. (Optional) Tap the **Full Screen View** button at the lower-right corner of the screen.

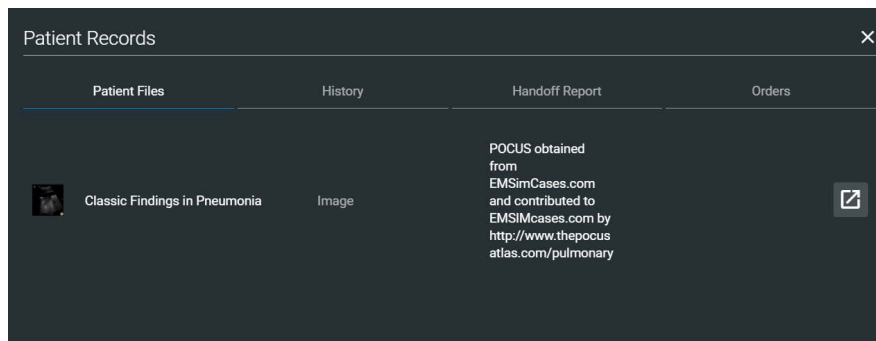
Tap the **Esc** key to exit full screen view.

Patient Records

To view Patient Records:

1. Tap **Patient Record** from patient monitor controls at the lower-left of the screen.

The Patient Records window appears.



Patient Records Window

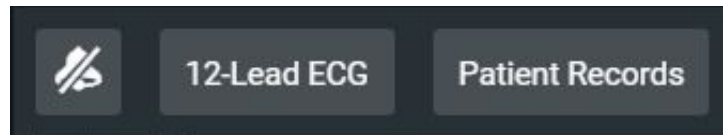
This information provides access to the same Patient Files, History, Handoff Report, and Orders information contained in Maestro.

Note: For this information to be visible in the Patient Monitor, the facilitator must send it from the Maestro software.

12-Lead ECG

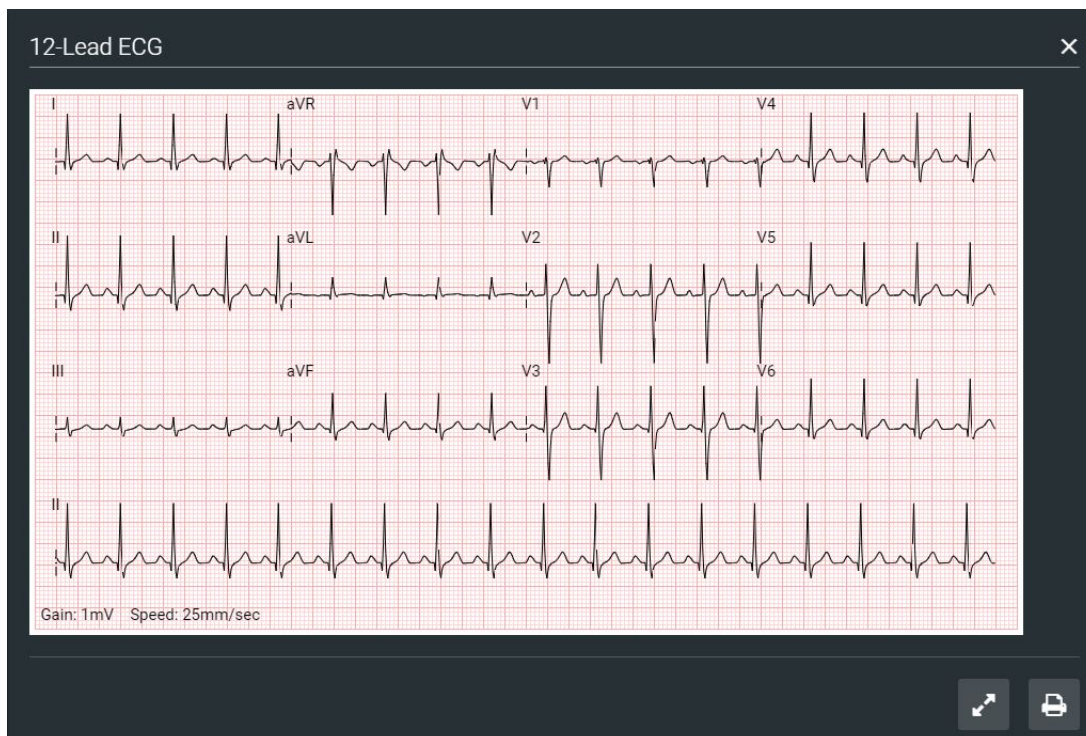
To view a 12-lead ECG report:

1. Tap **12-Lead ECG** from patient monitor controls at the lower-left of the screen.



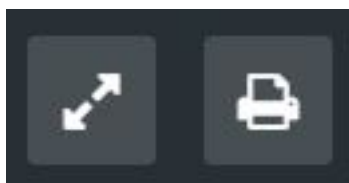
Patient Monitor Controls

The report appears.



12-Lead ECG Report

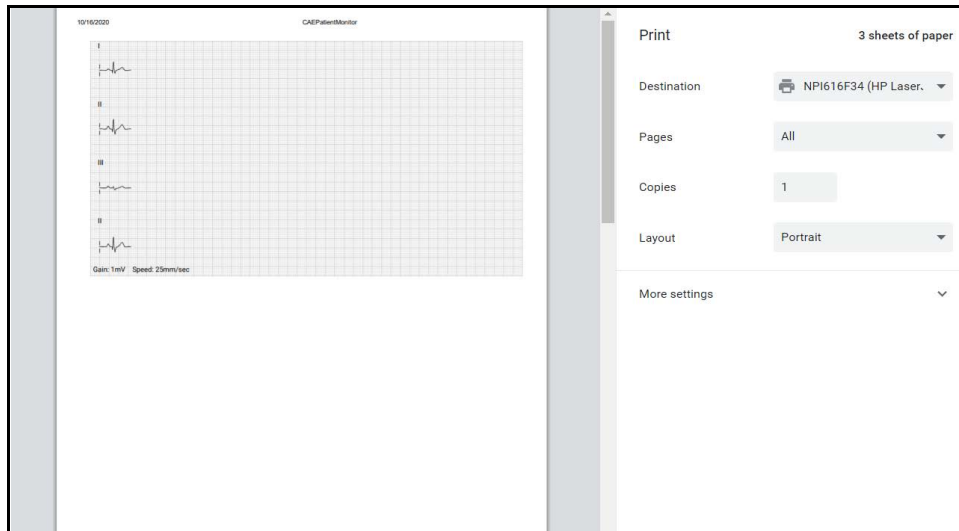
2. (Optional) To view the full screen, tap the **Full Screen View** button at the lower-right corner of the 12-lead ECG report.



Full Screen View and Print Buttons

3. Tap the **Esc** key to return to the inset view.
4. Tap the **Print** button to print the report.

The Print Settings window appears.



Print Settings Window

5. Select the print settings on the right side of the window.
6. Tap **Print** to print the report.

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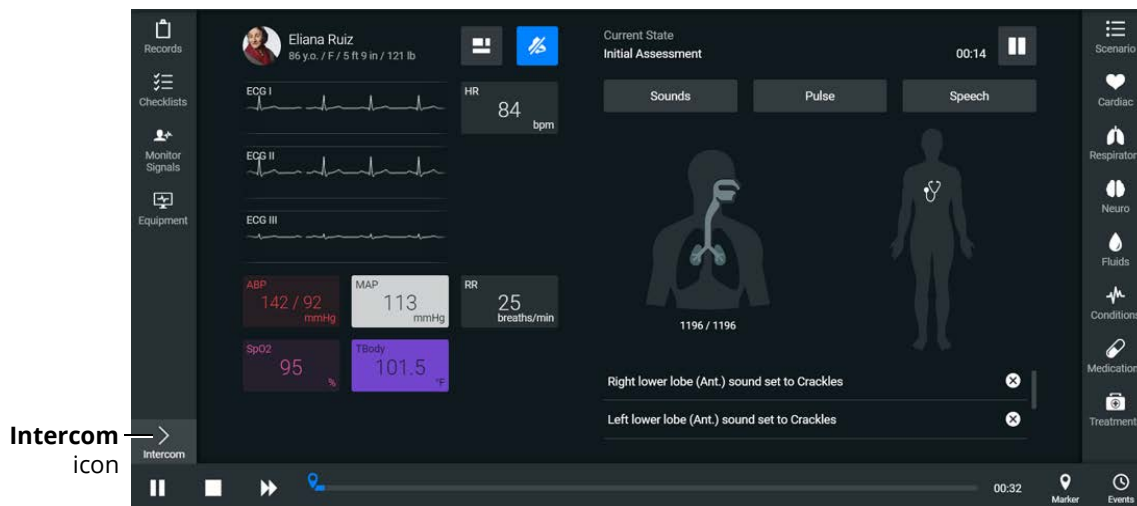
USING THE INTERCOM

CAE Maestro provides an intercom feature which allows the facilitator to speak as the patient or to communicate with other facilitators participating in the simulation. Users can speak through the intercom using a headset or by speaking directly into the tablet's microphone. Users can initiate one-way and two-way communications or mute audio communications.

Connect the Intercom

To connect the intercom:

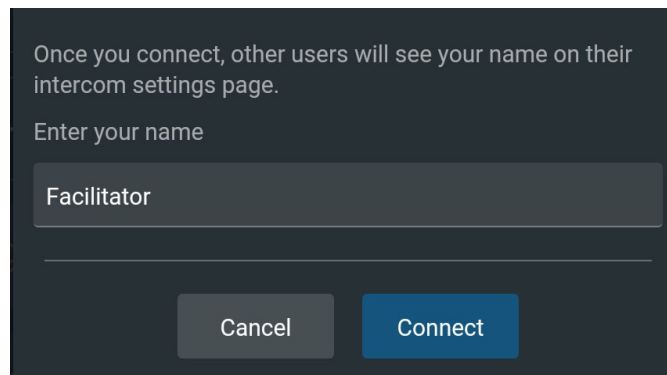
1. From the run screen, tap **Intercom** in the left panel to expand intercom options.



Run Screen

2. Once expanded, tap **Connect**.

The Connect Window appears.



Connect Window

3. Tap in the text field to access the keyboard and enter the desired name for the intercom.

4. Tap **Connect**.

Once connected, the Intercom Tools menu appears.



Intercom Tools Menu

Speak as the Patient

On the Intercom Tools menu:

- Tap and hold the **Patient** button to speak through the manikin's vocal speaker.
- Release the button to stop communication and mute the headset or tablet microphone.

Note: When the **Patient** button is released, the facilitator will continue to hear the learners via the manikin's microphone.

- To mute communications between facilitator and learners, tap **Mute All** on the Intercom Tools menu.

The manikin appears in the Settings panel list as **Simulator**. For more information, see *Settings*.

Communicate with Participants

Additional participants, such as another facilitator playing a role in the simulation, can join the communication network. To join:

1. Use another tablet to launch Maestro and connect to the Intercom.
2. Tap **Participants** on the Intercom Tools menu to begin communications with other participants in the simulation.

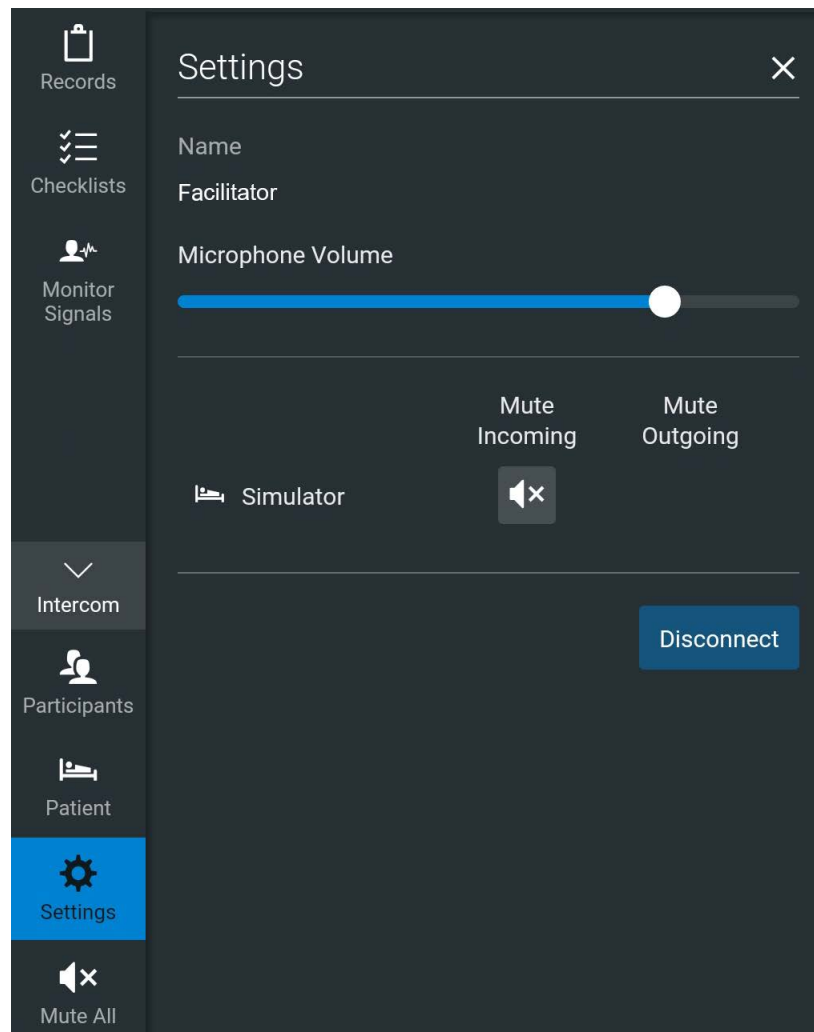
Once connected, each user will appear in the Settings panel list and can be muted as desired. For more information, see *Settings*.

Settings

Settings allow users to control how the intercom functions. To modify settings:

1. On the Intercom Tools menu, tap **Settings**.

The Settings panel appears.



Settings Panel

2. In the Settings panel, users can:
 - Use the slider to adjust the microphone volume.
 - Tap a **Mute** icon to mute communications with the manikin or with a selected participant.
 - Tap **Disconnect** to disconnect from the manikin’s intercom functions.

To exit the panel, tap the **X** icon.

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APPENDIX A - PARAMETER DESCRIPTIONS

The Maestro software has a number of parameters that control the patient status and software-controlled features of the simulator.

The parameters are grouped by category: Cardiac, Respiratory, Neuro, Fluids, Sounds, Pulse, and Speech.

The following is a brief description of each parameter. Each parameter description lists the default settings for the default baseline, as well as the ranges and/or controls for all patients.

Cardiovascular: Basic Parameters

Arterial Blood Pressure

The **Blood Pressure** parameter is used to set the value of the blood pressure (Manual mode) or override the physiological modeling for blood pressure in Modeled mode. The systolic and diastolic blood pressures can both be set to fixed numeric values, regardless of interventions performed. Resetting the parameter to **Modeled** returns control of the underlying blood pressure to the physiological models. The set change can also be programmed to occur over time using the onset control.

Default: Modeled or 116/77 (Manual mode)

Range:

- Systolic: 0 mmHg - 300 mmHg
- Diastolic: 0 mmHg - 300 mmHg

Central Venous Pressure (CVP)

The **CVP** parameter is used to set the CVP baseline and atrial contraction amplitude to fixed numeric values. Once set, intravascular volume changes have no effect on the CVP. In addition, once an override is applied, changes in tidal volume have no effect on the CVP waveform with the exception of an apneic patient where the minimum and maximum would be the same value since there is no inspiration or expiration. Depending on the volume status of the patient, the minimum/maximum value can be shifted up or down.

The available CVP controls are as follows:

- Minimum Diastolic: Baseline of the CVP at the end of an inspiration
- Maximum Diastolic: Baseline of the CVP at the end of an exhalation
- Pulse Amplitude: Size of the CVP wave during atrial contraction

For the override to take effect, the **Central Venous Catheter** must be set to the *Intrathoracic Vein*.

For example, with the minimum diastolic set to 5 mmHg, maximum diastolic set to 15 mmHg and pulse amplitude set to 2 mmHg, the CVP baseline is 15 mmHg, dipping to 5 mmHg with each inhalation, and the amplitude of the wave is 2 mmHg with each atrial contraction. The CVP baseline remains the same even in the event of intravascular volume changes and the depth of each dip due to inhalation remains at 5 mmHg even in the event of tidal volume changes. However, if the respiratory rate increases or decreases, the frequency of the dips will show a corresponding increase or decrease. The set change can also be programmed to occur over time using the onset control.

Default: Modeled or Manual mode as follows

- Minimum Diastolic: -2 mmHg
- Maximum Diastolic: 2 mmHg
- Pulse Amplitude: 3 mmHg

Range:

- Minimum Diastolic: -10 mmHg - 25 mmHg
- Maximum Diastolic: -10 mmHg - 25 mmHg
- Pulse Amplitude: 0 mmHg - 50 mmHg

Pulmonary Artery Pressure (PAP)

The **PAP** parameter is used to set the pulmonary artery pressure or to override the physiological modeling for pulmonary artery pressure in Modeled mode. The systolic and diastolic pressures can both be set to fixed numeric values, regardless of interventions performed. Resetting the parameter to **Modeled** returns control of the underlying pulmonary artery pressure to the physiological model. The set change can also be programmed to occur over time using the onset control.

Default: Modeled or 18/6 (Manual mode)

Range:

- Systolic: 0 mmHg - 50 mmHg
- Diastolic: 0 mmHg - 50 mmHg

Pulmonary Capillary Wedge Pressure (PCWP)

The **PCWP** parameter is used to display the patient's pulmonary capillary wedge pressure. It is used to simulate the pressure as measured by wedging a pulmonary catheter with an inflated balloon into a small pulmonary arterial branch. The set change can also be programmed to occur over time using the onset control.

Default: Modeled or 6 mmHg (Manual mode)

Range: -10 mmHg - 100 mmHg

Heart Rate

The **Heart Rate** parameter is used to set the heart rate to a given (fixed) number of beats per minute. Once the heart rate is set to a numeric value, administered drugs or intravascular volume changes have no effect on the heart rate, but continue to influence other components of the physiological models (in Modeled mode). Use this parameter to “fix” or set the heart rate to a specific number. In Manual mode, the set change can also be programmed to occur over time using the onset control.

Default: Modeled or 71 bpm (Manual mode)

Range: 30 beats per minute - 220 beats per minute

Cardiac Output

The **Cardiac Output** parameter displays the volume of blood pumped by the heart per minute. **Cardiac Output** is a function of heart rate (the number of heart beats per minute) and stroke volume (the volume of blood pumped out of the heart with each beat). **Cardiac Output** does not affect the rest of the physiology. For example, if cardiac output is set to zero, it will be shown on the CAE Patient Monitor as zero, but the patient will still have a blood pressure and pulses. In Manual mode, the set change can also be programmed to occur over time using the onset control.

Default: Modeled or 5.25.9 L/min:

Range: 0 L/min - 30 L/min

Cardiac Rhythm

The **Cardiac Rhythm** parameter is used to change the patient’s underlying cardiac rhythm displayed on the Patient Status Display or the CAE Patient Monitor. To change the cardiac rhythm, click the **Cardiac Rhythm** parameter and select the desired rhythm from the available list. If a number appears following the cardiac rhythm on the list, this overrides the heart rate to the rate indicated.

Default: Sinus

A

Asystole

Atrial Enlargement, Left

Atrial Enlargement, Right

Atrial Fibrillation

Atrial Flutter

Atrial Tachycardia

AV Block, First-Degree

AV Block, Second-Degree, Mobitz I

AV Block, Second-Degree, Mobitz II

AV Block, Third-Degree

AV Block, Third-Degree (Wide Complex)

B

Bundle Branch Block, Incomplete Right

Bundle Branch Block, Left

Bundle Branch Block, Right

H

Hypercalcemia

Hyperkalemia (Mild)

Hyperkalemia (Moderate)

Hyperkalemia (Severe)

Hypertrophy, Biventricular

Hypertrophy, Left Ventricular

Hypertrophy, Right Ventricular

Hypocalcemia

Hypokalemia

Hypothermia

I

Idioventricular

J

Junctional

L

Long QT Syndrome

M

Myocardial Ischemia, Mild

Myocardial Ischemia, Moderate

Myocardial Ischemia, Severe

N

NSTEMI

P

Paroxysmal Junctional Tachycardia

Pericarditis

Premature Atrial Contraction

S

Sinus

ST Elevation with Chest Pain

STEMI Anterior

STEMI Anterolatera

STEMI Inferior

STEMI Lateral

STEMI LBBB

STEMI Posterior

STEMI Septal

T

Torsade de Pointes

Trifascicular Block

V

Ventricular Fibrillation, Coarse

Ventricular Fibrillation, Fine

Ventricular Tachycardia

Ventricular Tachycardia, RV Outflow Tract

W

Wellen's Syndrome

Wide Complex Tachycardia

WPW Syndrome, Left Lateral Pathway

Pulseless Electrical Activity

The **Pulseless Electrical Activity** parameter triggers a clinical condition characterized by unresponsiveness and lack of palpable pulse in the presence of organized cardiac electrical activity. It is either ON or OFF.

Default: OFF

PVC Probability

The **PVC Probability** parameter represents the percentage of cardiac cycles containing a premature ventricular contraction (contraction of the ventricles that occurs earlier than usual due to abnormal electrical activity of the ventricles).

The **PVC Probability** is used to set the frequency of PVCs within any cardiac rhythm. The set change can also be programmed to occur over time using the onset control.

Default: Modeled or 0 (Manual mode)

Range: 0% - 90%

Ventricular Escape Rate

The **Ventricular Escape Rate** parameter is used to set the rate of ventricular escape beats. Ventricular escape rate does not affect the rest of the physiology. The set change can also be programmed to occur over time using the onset control.

Default: 30 bpm

Range: 10 to 50 bpm

Hemoglobin

The **Hemoglobin** parameter is used to set a fixed hemoglobin value. Hemoglobin does not affect the rest of the physiology. The value set will be shown on the CAE Patient Monitor if selected in one of the numeric fields. In Manual mode, the set change can also be programmed to occur over time using the onset control.

Default: Modeled or 14.4 (Manual mode)

Range: 10.0 g/dL - 20.0 g/dL

Cardiovascular: Advanced Parameters

Ventricle Contractility Factor: Left

The **Ventricle Contractility Factor: Left** parameter adjusts the contractility of the left ventricle and has a direct effect on cardiac output and blood pressure. Use this parameter to raise or lower the cardiac output.

Default: 1

Range: 0 - 10.00

Ventricle Contractility Factor: Right

The **Ventricle Contractility Factor: Right** parameter adjusts the contractility of the right ventricle and has a direct effect on cardiac output and blood pressure. Use this parameter to raise or lower the cardiac output.

Default: 1

Range: 0 - 10.00

Tamponade Volume

The **Tamponade Volume** parameter is used to set the amount of fluid or blood that is building up in the space between the myocardium and the pericardium, causing a cardiac tamponade.

Default: 0 ml

Range: 0 ml - 500 ml

Chest Compression Efficacy

The **Chest Compression Efficacy** parameter is used to determine the effectiveness of chest compressions administered by the caregiver. The ON/OFF setting indicates that chest compressions are completely effective, while the 0% setting prevents them from having any effect on intrathoracic pressure.

Default: ON

Options: ON/OFF

Resistance Factor: Aortic Valve

The **Resistance Factor: Aortic Valve** parameter is used to adjust the resistance to blood flow across the aortic valve. Increasing the value to greater than 1 corresponds to increased resistance to blood flow through the aortic valve.

Default: 1

Range: 1 - 1000

Resistance Factor: Mitral Valve

The **Resistance Factor: Mitral Valve** parameter is used to adjust the resistance to blood flow across the mitral valve. Increasing the value to greater than 1 corresponds to increased resistance to blood flow through the mitral valve.

Default: 1

Range: 1 - 1000

Resistance Factor: Systemic Vascular

The **Resistance Factor: Systemic Vascular** parameter adjusts the baseline systemic vascular resistance. Raising the value increases the systemic vascular resistance while lowering the value decreases the vascular resistance.

Raising the parameter value is analogous to increasing the resistance to blood flow through the systemic vasculature. Under such conditions, the arterial blood pressure (ABP) increases, and the heart rate may decrease due to feedback from the physiological control mechanisms.

Default: 1

Range: 0.10 - 10.00

Resistance Factor: Pulmonary Vasculature

The **Resistance Factor: Pulmonary Vasculature** parameter adjusts the baseline pulmonary vascular resistance. Raising the value increases the pulmonary vascular resistance, while lowering the value decreases the vascular resistance.

Raising the parameter value is analogous to increasing the resistance to blood flow through the pulmonary vasculature. Under such conditions, the pulmonary artery pressure (PAP) and central venous pressure (CVP) increase due to back-pressure through the right side of the heart.

Default: 1

Range: 0.10 - 10.00

Resistance Factor: Pulmonic Valve

The **Resistance Factor: Pulmonic Valve** parameter is used to adjust the resistance to blood flow across the pulmonic valve. Increasing the value to greater than 1 corresponds to increased resistance to blood flow through the pulmonic valve.

Default: 1

Range: 1 - 1000

Resistance Factor: Venous Return

The **Resistance Factor: Venous Return** parameter adjusts the resistance between the extrathoracic and intrathoracic venous compartments. Raising the value increases the resistance, while lowering the value decreases the resistance.

With less blood returning to the heart, there is a reduced volume entering the ventricles prior to ventricular contraction. This results in a drop in the cardiac output and decrease in arterial blood pressures. The heart rate increases due to feedback from the physiological control mechanisms in an attempt to maintain adequate blood pressures.

Default: 1

Range: 0.10 - 100.00

Compliance Factor: Left Ventricle

The **Compliance Factor: Left Ventricle** parameter adjusts the pulse pressure (difference between systolic and diastolic pressures) of the simulated patient's left ventricle.

Default: 1

Range: 0.20 - 5.00

Compliance Factor: Right Ventricle

The **Compliance Factor: Right Ventricle** parameter adjusts the pulse pressure (difference between systolic and diastolic pressures) of the simulated patient's left ventricle.

Default: 1

Range: 0.20 - 5.00

Compliance Factor: Systemic Arteries

The **Compliance Factor: Systemic Arteries** parameter adjusts the pulse pressure (difference between systolic and diastolic pressures) of the simulated patient's systemic blood pressure. Increases in the compliance factor result in a decreased (narrower) pulse pressure, while smaller values increase the pulse pressure. Additionally, when the pulse pressure increases as a result of a reduced compliance factor, both systolic and diastolic pressures increase. Conversely, with a narrower pulse pressure (higher compliance factor), both the systolic and diastolic blood pressures also drop.

Default: 1

Range: 0.50 - 5.00

Compliance Factor: Pulmonary Arteries

The **Compliance Factor: Pulmonary Arteries** parameter adjusts the pulse pressure (difference between systolic and diastolic pressures) of the simulated patient's pulmonary blood pressure. Increases in the compliance factor decrease (narrow) the pulse pressure, while smaller values increase the pulse pressure. Additionally, when the pulse pressure increases as a result of a reduced compliance factor, both systolic and diastolic pulmonary pressures increase. Conversely, with a narrower pulse pressure (higher compliance factor) both the systolic and diastolic pulmonary pressures also drop.

Default: 1

Range: 0.20 - 5.00

Capacity Factor: Venous

The **Capacity Factor: Venous** parameter adjusts the volume of blood contained in the unstretched venous system without an increase in venous pressure. Raising the value decreases the venous capacitance (vasodilatation and decreased vascular tone), while lowering the value increases the venous capacitance (vasoconstriction and increased vascular tone).

The volume of blood in the venous system has an inverse relationship to the blood pressure. Lowering the value is analogous to a “shift” in blood from the venous system to the arterial system, and this shift, when coordinated with increased systemic vascular resistance, results in an increase in blood pressure [arterial blood pressure (ABP), pulmonary artery pressure (PAP) and central venous pressure (CVP)].

Default: 1

Range: 0.10 - 100.00

Baroreceptor Minimum Pressure

Baroreceptor minimum pressure defines the mean arterial pressure (MAP) at which the baroreceptor inhibitory activity on the heart and systemic vasculature is minimal. When a simulated patient's MAP decreases below baseline pressure, the baroreceptor response exerts inhibitory controls on the MAP (e.g., increase in heart rate) in an attempt to return the MAP to the patient's baseline pressure. However, these controls have a lower limit, and this “minimum pressure” is defined as the baroreceptor minimum pressure.

In other words, as the MAP decreases, the physiological controls (i.e., baroreceptor response) work to bring the pressure back toward baseline, primarily by increasing the heart rate. For every 5 mmHg decrease in MAP, the heart rate may increase by 2 beats per minute in an attempt to keep the MAP in check. However, there is a lower limit (“minimum pressure”), after which these controls are no longer effective. Once the MAP reaches the baroreceptor minimum pressure, there is no additional increase in heart rate if the pressure continues to fall. For example, should the pressure continue to fall, the heart rate would not show a corresponding increase.

The MAP set-point is exactly between baroreceptor maximum pressure and baroreceptor minimum pressure.

Default: 72 mmHg

Range: 20 mmHg - 160 mmHg

Baroreceptor Maximum Pressure

Baroreceptor maximum pressure defines the mean arterial pressure (MAP) at which the baroreceptor inhibitory activity on the heart and systemic vasculature is maximal. When a simulated patient's MAP increases above baseline pressure, the baroreceptor response exerts greater inhibitory controls on the MAP (e.g., reduction in heart rate) in an attempt to return the MAP to the patient's baseline pressure. However, these controls have an upper limit, and this "maximum pressure" is defined as the baroreceptor maximum pressure.

In other words, as the MAP increases, the physiological controls (i.e., baroreceptor response) work to bring the pressure back toward baseline, primarily by reducing the heart rate. For every 5 mmHg increase in MAP, the heart rate may decrease by 2 beats per minute in an attempt to keep the MAP in check. However, there is an upper limit ("maximum pressure"), after which these controls are no longer effective. Once the MAP reaches the baroreceptor maximum pressure, there is no additional reduction in heart rate if the pressure continues to rise. For example, should the pressure continue to rise, the heart rate would not show a corresponding slowing.

The MAP set-point is exactly between baroreceptor maximum pressure and baroreceptor minimum pressure.

Default: 112 mmHg

Range: 40 mmHg - 220 mmHg

Baroreceptor Gain Factor: Overall

The **Baroreceptor Gain Factor: Overall** parameter adjusts the influence of mean arterial pressure (MAP) on heart rate, contractility, systemic vascular resistance and venous capacity. Use this parameter to adjust how vigorously the heart and vasculature respond to blood pressure changes. The degree of increase in heart rate or vascular response is influenced by the baroreceptor gain (overall) factor.

For example, when blood pressure falls, the heart rate increases, the arteries increase their vascular tone (resistance) and there is less pooling of the blood in the venous system, all in an attempt to maintain adequate blood pressure. A baroreceptor gain (overall) factor value of less than 1 corresponds to baroreceptor depression. A baroreceptor gain (overall) factor value greater than 1 leads to a stronger response to MAP changes.

Default: 1

Range: 0.00 - 100.00

Baroreceptor Gain Factor: Cardiac

The **Baroreceptor Gain Factor: Cardiac** parameter selectively adjusts the influence of mean arterial pressure (MAP) on the heart rate and contractility, influencing how much the heart rate increases or decreases with changes in blood pressure. Use this parameter to adjust how vigorously the heart responds to blood pressure changes.

A baroreceptor gain (cardiac) factor of less than 1 corresponds to baroreflex depression (e.g., less heart rate response to MAP changes). A value greater than 1 leads to a stronger response to MAP changes.

Default: 1

Range: 0.00 - 10.00

Baroreceptor Gain Factor: Peripheral

The **Baroreceptor Gain Factor: Peripheral** parameter adjusts the influence of mean arterial pressure (MAP) on systemic vascular resistance and venous capacity, influencing how much the vasculature responds to changes in blood pressure.

For example, when blood pressure falls, the arteries increase their vascular tone (resistance), and there is less pooling of the blood in the venous system, in an attempt to maintain adequate blood pressure. A factor of less than 1 corresponds to baroreflex depression (e.g., less systemic vascular resistance response to MAP changes). A value greater than 1 leads to a stronger response to MAP changes.

Default: 1

Range: 1.00 - 10.00

Ischemic Index Sensitivity

The **Ischemic Index Sensitivity** parameter determines the relative sensitivity of the simulated patient to myocardial ischemia. A lower ischemic index sensitivity value corresponds to less sensitivity to an unfavorable oxygen supply/demand ratio (i.e., poor oxygenation with high heart rate). A patient with a low value is less sensitive to poor oxygenation, takes longer to go into the “death spiral” and, therefore, survives longer.

Default:

Range: 0.10 - 5.00

Model-Driven ECG Rhythm	Ischemic Index (I.I.)
Normal Sinus Rhythm (NSR)	$I.I. \geq 0.90$
Mild ST Segment Depression	$0.90 > I.I. \geq 0.70$
Moderate ST Segment Depression	$0.70 > I.I. \geq 0.60$
Premature Ventricular Contractions (PVCs)	$0.60 > I.I. \geq 0.40$
Ventricular Tachycardia (VTach)	$0.40 > I.I.$

Model-Driven ECG Rhythm	Ischemic Index (I.I.)
Ventricular Fibrillation (VFib)	1 minute after VTach
Asystole	1 minute after VFib

The patient's response to myocardial ischemia may be altered using the **Ischemic Index Sensitivity** parameter found on the Cardiovascular view. To make the patient less sensitive to ischemia, lower the value below the default setting. To make the patient more sensitive, increase the value above the default setting. These changes are then reflected in the patient's Ischemic Index, as shown in the table above.

Ischemic Index Averaging

Ischemic index averaging determines how quickly myocardial ischemia develops in the presence of an unfavorable oxygen supply/demand ratio or how rapidly it resolves when myocardial oxygenation becomes favorable. By decreasing the averaging time (i.e., value toward 0.5), ischemia has a faster onset if there is a poor oxygen supply to the heart or a faster resolution with favorable oxygenation. Increasing the averaging time (i.e., value toward 0.99) means ischemia takes longer to develop or longer to resolve.

Use this parameter to speed up the recovery from the model-driven "death spiral." By setting the parameter to 0.5, a patient pulls out of the "death spiral" at a faster rate than with a setting of 0.99. However, the favorable conditions (i.e., better oxygenation and/or lower heart rate) must exist before the number is made smaller. If not, the patient's descent increases at a faster rate.

Default: 0.99

Range: 0.50 - 1.00

Defibrillation Energy

The **Defibrillation Energy** parameter is used to simulate a specified amount of energy discharged via an external cardiac defibrillator. Setting this parameter results in the characteristic spike in the ECG, followed by a return to the pre-defibrillation rhythm. **Defibrillation Energy** has no direct effect on the electrical conduction system of the heart. Thus, synchronized cardioversion may be done "on the fly" or scripted using the Scenario Designer.

Default: 0 Joules

Range: 0 Joules - 360 Joules

Pacing Capture Threshold

The **Pacing Capture Threshold** parameter determines the minimum pacing current necessary to pace the heart via an external cardiac pacer. Also see **Pacing Current**. Pacing current values below the pacing capture threshold have no effect on the patient's heart rate.

Default: 50 mA

Range: 0 mA - 119 mA

Pacing Current

The **Pacing Current** parameter is used to simulate a specified amount of current discharged via an external cardiac pacer. Setting this parameter results in the characteristic pacing signal on the ECG waveform when the pacing current is at or above the capture threshold. Also, see **Pacing Capture Threshold**.

Default: 0 mA

Range: 0 mA - 200 mA

Pacing Rate

The **Pacing Rate** parameter determines the cardiac rate (in beats/minute) when the pacing current is at or above the pacing capture threshold. Also, see **Pacing Current** and **Pacing Capture Threshold**.

Default: 80 beats per minute

Range: 0 beats per minute - 119 beats per minute

Respiratory: Basic Parameters

Apnea

The **Apnea** parameter triggers a clinical condition characterized by no spontaneous breathing. Lung sounds and vocal sounds will cease when apnea is enabled. It is either ON or OFF.

Default: OFF

Bronchial Occlusion (Left and Right)

Turning on the **Bronchial Occlusion** parameter completely obstructs the right or left bronchi, simulating a lower airway obstruction (e.g., mucus plug).

Right and left bronchi can be occluded individually.

Improper intubation creates a mainstem occlusion, yielding an inability to ventilate the lungs. However, the right and left bronchi are not occluded individually.

Default: OFF

Respiratory Rate

The **Respiratory Rate** parameter is used to set the respiratory rate to a given number of breaths per minute. In Modeled mode, when the Respiratory Rate is set, arterial oxygen and carbon dioxide values have no effect on the resulting respiratory rate, but continue to influence other components

of the physiological models. The patient continues to breathe at the set number of breaths per minute, regardless of the arterial oxygen or carbon dioxide levels.

For example, when the respiratory rate is set to 10 breaths per minute, the respiratory rate remains at 10 breaths per minute, regardless of arterial oxygen or carbon dioxide levels.

Default: Modeled or 11 (Manual mode)

Range: 0 breaths per minute - 40 breaths per minute

SpO₂

The SpO₂ parameter overrides the physiology and sets a fixed numeric value, regardless of the oxygen applied. Resetting to **Modeled** returns control of the underlying SpO₂ to the physiological models. If SpO₂ is set to less than 75%, the eyes will automatically close when in the Auto mode.

Default: 98%

Range: 0% - 100%

Improved Capnogram

Turning this feature on adjusts the waveform for a more realistic display when using virtual equipment.

EtCO₂

The EtCO₂ parameter is used to set the end-tidal CO₂ to a fixed numeric value, measured in mmHg, regardless of the minute ventilation. The end exhalation point of the capnogram waveform will also reflect the set end-tidal CO₂ value. Setting the EtCO₂ has no effect on the arterial carbon dioxide values (PaCO₂), respiratory rate or tidal volume.

For example, when the EtCO₂ is set to 50 mmHg, the numeric end-tidal CO₂ will display 50 mmHg and the capnogram waveform rises to an end-tidal of 50 mmHg. However, the respiratory rate and tidal volume will remain the same unless the Respiratory Rate and/or the Tidal Volume parameter(s) is adjusted.

Default: Modeled

Range: 0 mmHg – 100 mmHg

Tidal Volume

The **Tidal Volume** parameter sets the tidal volume to a given volume per breath. Once Tidal Volume is set to a numeric value, arterial oxygen and carbon dioxide values have no effect on the tidal volume, but continue to influence other components of the physiological models (in Modeled mode).

For example, with the tidal volume set to 600mL in the adult simulator, the tidal volume remains a constant (set) 600 mL even in the event of falling arterial oxygen levels. In such situations, the patient can only respond to arterial oxygen or carbon dioxide levels by altering the respiratory rate.

Default: Modeled or 500 mL (Manual mode)

Range: 0 mL - 2500mL

I to E Ratio (1:X)

The **I to E Ratio (1:X)** parameter can be used to change the ratio of inspiratory time:expiratory time (I:E). The I to E Ratio does not affect physiology. The set change also be programmed to occur over time using the onset control.

Default: 2.0

Range: 0.5 - 7.0

pH

Use the pH parameter to set a fixed pH value. The pH does not affect the rest of the physiology. The value set will be shown on the patient monitor if selected in one of the numeric fields. The set change can also be programmed to occur over time using the onset control.

Default: 7.45

Range: 6.9 - 7.9

Fraction of Inspired O₂ (FiO₂)

This parameter is used to simulate changes in the **FiO₂**, such as would occur with the administration of supplemental oxygen. This parameter does not affect the rest of the physiology.

Default: 21%

Range: 0% - 100%

Intrapleural Volume (Vol): (Left and Right)

The **Intrapleural Vol** parameters allow intrapleural volume to accumulate, for example, as happens during pneumothorax, hydrothorax or hemothorax.

To simulate a pneumothorax, set the corresponding **Intrapleural Vol** to a value greater than 0 mL. Values more than 1500 mL reduce the corresponding lung volume significantly. Breath sounds are automatically diminished on the appropriate side due to decreased ventilation of the affected lung.

Default: 0 mL

Range: 0 mL - 2500 mL

Respiratory: Advanced Parameters

Chest Wall Capacity

The **Chest Wall Capacity** parameter sets the total (combined) intrapleural and lung volumes at which the chest wall is considered distended. Also, see **Chest Wall Compliance Factor** and **Distended Chest Wall Compliance Factor**.

Default: 3900

Range: 1500 - 3900

Chest Wall Compliance Factor

The **Chest Wall Compliance Factor** parameter describes the interaction of the chest wall with the lungs. The **Chest Wall Compliance Factor** parameter defines the volume-pressure relationship in the normal operating lung volumes. Once distended, however, the chest wall rapidly becomes much less compliant (i.e., much “stiffer”) and resistant to further inflation.

Default: 1

Range: 0.15 - 10.00

Distended Chest Wall Compliance Factor

The **Distended Chest Wall Compliance Factor** parameter, along with the **Chest Wall Compliance Factor** parameter, describes the interaction of the chest wall with the lungs. The **Chest Wall Compliance Factor** parameter defines the volume-pressure relationship in normal lung volumes. Once distended, however, the chest wall rapidly becomes much “stiffer” and resistant to further inflation.

The **Distended Chest Wall Compliance Factor** parameter must be set to a low value for increased intrapleural volumes to result in elevated inspiratory pressures with positive pressure ventilation. Also, see **Intrapleural Volume (Vol): (Left and Right)**.

Default: 1

Range: 0.10 - 10.00

Functional Residual Capacity

The **Functional Residual Capacity** parameter sets the combined left and right lung volume remaining at the end of a normal, spontaneous exhalation. This parameter influences the speed of desaturation during apnea.

Default: 2300 mL

Range: 500 mL - 4000 mL

Lung Compliance Factor: (Left and Right)

These two parameters independently set the left and right lung compliance. **Lung Compliance Factor** determines how easily the lungs inflate. Low compliance factors (less than 1) create “stiff” lungs (such as in acute respiratory distress syndrome or pulmonary edema) requiring more pressure for expansion. High compliance factors (greater than 1) create “loose” lungs that easily inflate with less pressure.

Default: 1

Range: 0.15 - 10.00

PaCO₂ Set-point

The **PaCO₂ Set-point** parameter is a set-point for PaCO₂. The control-of-breathing model adjusts tidal volume and respiratory rate in order to bring the PaCO₂ toward this set-point. Factors that influence the success of this control effort include baseline tidal volume, baseline respiratory rate, respiratory gain, O₂ consumption, respiratory quotient, lung compliances, chest wall compliance, bronchial resistances, the presence of artificial airways in the simulator and the inspired gas mixture.

When the **PaCO₂ Set-point** is set to a new value, the physiological controls adjust the simulator’s respiratory pattern in an attempt to attain the desired set-point. For example, when the set-point is raised from 40 to 50 mmHg, there is a transitory decrease in respiratory rate and tidal volume, as the physiological controls attempt to drive the PaCO₂ toward 50 mmHg. When the PaCO₂ reaches the new set-point, the simulator’s respiratory rate and tidal volume should return to normal values.

Default: 40 mmHg

Range: 20.0 mmHg - 70.0 mmHg

PaO₂ Set-point

The **PaO₂ Set-point** parameter is a set-point for PaO₂. When PaO₂ is below the set-point value, progressive stimulation of spontaneous minute ventilation occurs. Both tidal volume and respiratory rate rise, which under appropriate conditions results in PaO₂ moving closer to the set-point. Factors that influence this control effort include baseline tidal volume, baseline respiratory rate, respiratory gain, O₂ consumption, respiratory quotient, lung compliances, chest wall compliance, bronchial resistances, the presence of artificial airways in the simulator and the inspired gas mixture. Minute ventilation is not affected for PaO₂ above the set-point.

For example, if **PaO₂ Set-point** is set to 100 mmHg and PaO₂ drops to 90 mmHg, ventilatory stimulation occurs. When PaO₂ reaches the new set-point, the simulator’s respiratory rate and tidal volume are again controlled to maintain PaCO₂ at the PaCO₂ set-point. Also, see **PaCO₂ Set-point**.

Default: 100.00 mmHg

Range: 20.0 mmHg - 100.0 mmHg

PetCO₂ - PaCO₂ Factor

The **PetCO₂ - PaCO₂ Factor** adjusts the end-tidal CO₂ relative to the PaCO₂. At the default value of 1, PetCO₂ very closely approximates PaCO₂. When **PetCO₂ - PaCO₂ Factor** is set at a value of 2, PetCO₂ is approximately one half of PaCO₂. PetCO₂ depends on CO₂ production and alveolar ventilation. Because the alveolar dead space is not modeled physically in the hardware, the responses to changes in mechanical ventilation settings may not be exact. The use of the Onset feature (e.g., onset over a 1-minute period) is recommended for this parameter.

Default: 1

Range: 0.9 - 10.0

Respiratory Gain Factor

The **Respiratory Gain Factor** determines how strong an influence arterial CO₂ levels have on the simulated patient's tidal volume and respiratory rate. Under default conditions (value = 1), when arterial CO₂ levels rise, the patient's respiratory rate and tidal volume show a transitory increase in an attempt to return the patient to the physiological control CO₂ set-point. If the **Respiratory Gain Factor** is increased to more than 1, the patient has a more pronounced response, while values less than 1 correspond to a blunted response.

Default: 1

Range: 0.00 - 10.00

Volume/Rate Control Factor

Ventilatory responses to increased arterial carbon dioxide or decreased arterial oxygen may take the form of increased tidal volume, increased respiratory rate, or both. The **Volume/Rate Control Factor** determines these relative changes. At a value of 1, increased and decreased ventilatory drive affect tidal volume and respiratory rate equally. When the **Volume/Rate Control Factor** is greater than 1, increased or decreased minute ventilation is predominantly achieved by changes in tidal volume. When the **Volume/Rate Control Factor** is less than 1, ventilatory changes are affected primarily by changes in respiratory rate.

For example, set the **Volume/Rate Control Factor** to 0.1 and increase the shunt fraction to 0.4 to decrease the arterial O₂. The patient responds to falling arterial oxygen levels with increased minute ventilation. Increasing the respiratory rate with minimal increase in tidal volume produces this.

Default: 1

Range: 0.1 - 10.0

Venous CO₂ Shift

The **Venous CO₂ Shift** parameter affects the partial pressure of CO₂ in the venous blood. Changing this parameter allows large and rapid shifts in total body CO₂ concentration. Increases in alveolar and arterial CO₂ follow rapidly in a physiologically correct magnitude and time course.

This parameter is useful for giving a “bolus” of CO₂ to the venous system. The alveolar and arterial CO₂ levels rise rapidly in response to the added carbon dioxide but soon return to “pre-bolus” levels as increased ventilation efforts work to eliminate the added CO₂. Therefore, the rise in CO₂ levels is only transitory. This parameter can be used to simulate external CO₂ administration such as that used during laparoscopy.

Note: *This parameter is only intended to be used while running an SCE. SCEs and patients should NOT be saved once the parameter has been applied. If an SCE or patient is saved after the **Venous CO₂ Shift** parameter has been applied, unexpected behavior may occur when the SCE or patient is reloaded.*

Default: 0 mmHg

Range: 0.0 mmHg - 60.0 mmHg

pH Shift

The **pH Shift** parameter is used to create a metabolic acidosis or metabolic alkalosis under script control.

The default pH value displayed on the Patient Status Display or TouchPro software is dependent on respiratory arterial CO₂ values. Under default conditions (PaCO₂ = 40 mmHg), the pH is approximately 7.4. Rising arterial CO₂ produces a subsequent drop in pH, while falling arterial CO₂ levels result in rising pH values.

To simulate pH changes with metabolic changes (acidosis or alkalosis), the **pH Shift** value is a mathematical addition to (or subtraction) from the displayed pH value to that which is desired.

Default: 0

Range: -(0.50) - 0.50

O₂ Consumption

The **O₂ Consumption** parameter is used to change the rate of consumption of oxygen and production of carbon dioxide. When **O₂ Consumption** is increased and used with increased **Shunt Fraction**, profound levels of hypoxia can be achieved rapidly.

Default: 250 mL per minute

Range: 0 mL per minute - 2000 mL per minute

CO₂ Production Factor

The **CO₂ Production Factor** parameter allows for the manipulation of metabolic CO₂ production to simulate a variety of pathophysiological conditions. CO₂ production is determined by the **O₂ Consumption** and **Respiratory Quotient** settings. A CO₂ Production Factor value of 2 doubles the CO₂ production, while a value of 0.5 decreases the CO₂ production by 50%.

Default: 1

Range: 0.50 - 4.00

Respiratory Quotient

Respiratory Quotient is the rate of carbon dioxide production divided by the rate of oxygen consumption. Changes to the **Respiratory Quotient** parameter alter the rate of carbon dioxide production relative to the rate of oxygen consumption.

Default: 0.8

Range: 0.70 - 1.10

Positive End Expiratory Pressure (PEEP)

The PEEP parameter specifies the amount of positive end expiratory pressure applied during mechanical ventilation. Setting this parameter results in clinically appropriate intrathoracic pressures and hemodynamic responses. **PEEP** must be set both in the software and on the ventilator.

Default: 0.0 cmH₂O

Range: 0.0 cmH₂O - 25.0 cmH₂O

Alveolar Enflurane

The **Alveolar Enflurane** parameter is used to simulate the presence of enflurane in the alveolar space without using real anesthetic vapors. The enflurane percentage is input to the drug models to achieve the expected pharmacodynamic effects (e.g., respiratory depression).

Using this parameter bypasses pharmacokinetics, real and instructor-specified inspired fractions, venous content, lung perfusion and ventilation. This parameter can be used to focus on cardiorespiratory effects (pharmacodynamics).

Note: Maestro does not verify a 100% sum of all fractions, because this would require all fractions to be set.

Default: Modeled

Range: 0.00% - 5.00%

Fraction of Inspired Enflurane

The **Fraction of Inspired Enflurane** parameter is used to simulate the amount of enflurane set in the anesthetic vaporizer and is used to calculate alveolar enflurane.

This parameter has a faster effect on physiology than anesthesia machine settings, because mixing in the breathing circuit is not simulated.

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: 0%

Range: 0.00% - 5.00%

Alveolar Halothane

The **Alveolar Halothane** parameter is used to simulate the presence of halothane in the alveolar space without using real anesthetic vapors. The halothane percentage is input to the drug models to achieve the expected pharmacodynamic effects (e.g., respiratory depression).

Using this parameter bypasses pharmacokinetics, real and instructor-specified inspired fractions, venous content, lung perfusion and ventilation. This parameter can be used to focus on cardiorespiratory effects (pharmacodynamics).

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: Modeled

Range: 0.00% - 5.00%

Fraction of Inspired Halothane

The **Fraction of Inspired Halothane** parameter is used to simulate the amount of halothane set in the anesthetic vaporizer and is used to calculate alveolar halothane.

This parameter has a faster effect on physiology than anesthesia machine settings, because mixing in the breathing circuit is not simulated.

Note: Maestro does not verify a 100% sum of all fractions, because this would require all fractions to be set.

Default: 0%

Range: 0.00% - 5.00%

Alveolar Isoflurane

The **Alveolar Isoflurane** parameter is used to simulate the presence of isoflurane in the alveolar space without using real anesthetic vapors. The isoflurane percentage is input to the drug models to achieve the expected pharmacodynamic effects (e.g., respiratory depression).

Using this parameter bypasses pharmacokinetics, real and instructor-specified inspired fractions, venous content, lung perfusion and ventilation. This parameter can be used to focus on cardiorespiratory effects (pharmacodynamics).

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: Modeled

Range: 0.00% - 5.00%

Fraction of Inspired Isoflurane

The **Fraction of Inspired Isoflurane** parameter is used to simulate the amount of isoflurane set in the anesthetic vaporizer and is used to calculate alveolar isoflurane.

This parameter has a faster effect on physiology than anesthesia machine settings, because mixing in the breathing circuit is not simulated.

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: 0%

Range: 0.00% - 5.00%

Alveolar Nitrous Oxide

The **Alveolar Nitrous Oxide** parameter is used to simulate the amount of nitrous oxide set in the anesthetic vaporizer and is used to calculate alveolar nitrous oxide.

Using this parameter bypasses pharmacokinetics, real and instructor-specified inspired fractions, venous content, lung perfusion and ventilation. This parameter can be used to focus on cardiorespiratory effects (pharmacodynamics).

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: 0.00%

Range: 0.00% - 80.0%

Fraction of Inspired Nitrous Oxide

The **Fraction of Inspired Nitrous Oxide** parameter is used to simulate the amount of nitrous oxide set in the anesthetic vaporizer and is used to calculate alveolar nitrous oxide.

This parameter has a faster effect on physiology than anesthesia machine settings, because mixing in the breathing circuit is not simulated.

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: 0%

Range: 0.00% - 80.0%

Alveolar Sevoflurane

The **Alveolar Sevoflurane** parameter is used to simulate the presence of sevoflurane in the alveolar space without using real anesthetic vapors. The sevoflurane percentage is input to the drug models to achieve the expected pharmacodynamic effects (e.g., respiratory depression).

Using this parameter bypasses pharmacokinetics, real and instructor-specified inspired fractions, venous content, lung perfusion and ventilation. This parameter can be used to focus on cardiorespiratory effects (pharmacodynamics).

Note: Maestro does not verify a 100% sum of all fractions, because this would require all fractions to be set.

Default: Modeled

Range: 0.00% - 8.00%

Fraction of Inspired Sevoflurane

The **Fraction of Inspired Sevoflurane** parameter is used to simulate the amount of sevoflurane set in the anesthetic vaporizer and is used to calculate alveolar sevoflurane.

This parameter has a faster effect on physiology than anesthesia machine settings, because mixing in the breathing circuit is not simulated.

Note: Maestro does not verify a 100 % sum of all fractions, because this would require all fractions to be set.

Default: 0%

Range: 0.00% - 8.00%

Neurological

Intracranial Pressure (ICP)

The ICP parameter is used to set the ICP displayed as a numeric value on the Patient Status Display and on the CAE Patient Monitor.

Default: Modeled or 9.4 mmHg (Manual mode)

Range: 0 mmHg - 65 mmHg

Temperature: Body

The temperature measured at the body surface can be set using this parameter and can be displayed on the Patient Status Display and the CAE Patient Monitor. Body temperature is not linked to the physiologic models, however, changes can be made “on the fly” or scripted using the Scenario Designer. The set change can also be programmed to occur over time using the onset control.

Default: 36.5°C

Range: 32.0°C - 42.0°C

Temperature: Blood

The arterial blood temperature can be set using the **Temperature: Blood** parameter. The arterial blood temperature can then be displayed on the Patient Status Display and the CAE Patient Monitor. The set change can also be programmed to occur over time using the onset control.

Default: 37°C

Range: 32.0°C - 42.0°C

Fluids

There are two categories of fluids: BLEEDING and INFUSION.

BLEEDING

Fluid Loss Blood

When used, the **Fluid Loss Blood** parameter allows users to apply a decrease in total blood volume. Blood loss proportionally decreases both the red blood cell volume and the plasma volume according to the current hematocrit. The loss of volume can be an immediate one time loss or a loss over time. A custom volume amount and rate can also be set.

Range: 0 mL - 6000mL

Fluid Loss Plasma

When used, the **Fluid Loss Plasma** parameter reflects a decrease in plasma volume. Plasma loss decreases the plasma volume without changing the red blood cell volume. It refers collectively and generically to all fluid losses, including evaporative, transcellular, bowel and third space fluid losses. The loss of volume can be an immediate one time loss or a loss over time. A custom volume amount and rate can also be set.

Range: 0 mL - 6000 mL

INFUSION

Colloid Infusion

When used, the **Colloid Infusion** parameter reflects an addition to the plasma volume without changing the red blood cell volume. Colloids include modified fluid gelatin starch solutions, dextran and human albumin. The volume selected can be administered as an immediate bolus or as an infusion over time. A custom bolus amount or infusion rate can also be set.

Range: 0 mL - 6000 mL

Crystalloid Infusion

When used, the **Crystalloid Infusion** parameter reflects an addition to the plasma volume without changing the red blood cell volume. The term crystalloid is used to describe salt solutions for infusion (e.g., normal saline, dextrose in water, Ringer's Lactate). The volume selected can be administered as an immediate bolus or as an infusion over time. A custom bolus amount or infusion rate can also be set.

Range: 0 mL - 6000 mL

PRBC Infusion

Packed red blood cells are a preparation of 70% red blood cells and 30% liquid plasma, often administered in severe anemia to restore adequate levels of hemoglobin and red cells without overloading the vascular system with excess fluids. The volume selected can be administered as an immediate bolus or as an infusion over time. A custom bolus amount or infusion rate can also be set.

Range: 0 mL - 6000 mL

Whole Blood Infusion

The term whole blood is used to refer to blood that has not been separated into its various components. It represents a preparation of 40% red blood cells and 60% liquid plasma. The volume selected can be administered as an immediate bolus or as an infusion over time. A custom bolus amount or infusion rate can also be set.

Range: 0 mL - 6000 mL

Sounds

A variety of simulated sounds are available to create a realistic experience. Click the **Sounds** button on the Run screen to access the Sounds controls.

Heart Sounds

Heart sounds are synchronized with the cardiac cycle and can be auscultated over the left upper and lower sternal border.

Heart sounds are synchronized with the cardiac cycle and can be auscultated over the sternal border and left lower sternal border and apex.

Heart sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Heart Sounds**. The Heart Sounds menu will appear.

Independent control of the type and volume of heart sounds may be selected in each anatomical region.

Locations:

- Aortic
- Mitral
- Pulmonic
- Tricuspid

To affect the heart sounds simultaneously in all anatomical regions, select **All** and the desired sound.

Default: Normal

Type:

- Normal
- S3
- S4
- S3 and S4
- Early Systolic Murmur
- Mid Systolic Murmur
- Late Systolic Murmur
- Pan Systolic Murmur
- Late Diastolic Murmur

Note: The volume control slider can be used to adjust the amplitude of the sound.

Lung Sounds

Normal and abnormal breath sounds are selected using this parameter. Breath sounds are synchronized with ventilation of the left and right lungs.

Breath sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Lung Sounds**. The Lung Sounds menu will appear.

Independent control of the type and volume of heart sounds may be selected in each anatomical region.

Locations:

- Left Upper
- Left Lower
- Right Upper
- Right Lower

To change breath sounds, select the desired sound from the **Lung Sounds** menu.

Default: Normal

Type:

- Normal
- Wheezing
- Crackles
- Rhonchi
- Diminished
- Gurgling
- Pleural Rub

NOTE: The volume control slider can be used to adjust the amplitude of the sound.

Bowel Sounds

Bowel sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Bowel Sounds**. The Bowel Sounds menu will appear.

Normal, Hypoactive, Hyperactive and absent bowel sounds (**None**) are selected using this parameter.

Type:

- Normal
- Hypoactive
- Hyperactive

Independent control of the type and volume of bowel sounds may be selected in each anatomical region.

Locations:

- Left Upper
- Right Upper
- Left Lower
- Right Lower

To affect the bowel sounds simultaneously in all anatomical regions, select All Bowel Sounds and the desired sound.

Default: Normal

Note: The volume control slider underneath each area may be used to adjust the amplitude of the sound. The volume control slider is only enabled while connected to a simulator.

Pulse

All pulses are enabled by default, unless altered by an SCE. To change a pulse setting, tap the **Pulse** icon on the Run screen. Tap the desired pulse location on the image.

Pulse	Default	Range
Brachial Right	ON	Not Applicable
Brachial Deficit	80 mmHg	0 - 300
Radial Right	ON	Not Applicable
Radial Right Deficit	90 mmHg	0 - 300

The pulse can be turned ON or OFF, and the pulse intensity can be set to:

- Absent
- Weak
- Normal
- Bounding

The pulse deficit can be changed from the default to another value. When the systolic pressure falls below the set pulse deficit, the pulse will turn off.

Speech

Vocal speech sounds and speech sounds are selected using this parameter. These sounds can be turned on or off, and the volume can be adjusted using the **Volume** slider. Sounds will emanate from a speaker in or near the head of the simulator.

Note: When using the Standalone Maestro software, Speech selections are functional and will be logged, but they will not be heard due to the absence of the simulator.

Vocal Speech Sound

Vocal speech sounds are selected by tapping on the **Speech** button on the Run screen. When the Speech panel appears, select a sound from the dropdown menu under **Vocal Speech Sound**. The sound plays continuously until either None or another vocal speech sound is selected, or until Speech is turned off.

Default: None

Vocal Speech Sounds:

- None
- Gagging
- Gasping
- Groaning
- Long Loud Cough
- Long Soft Cough
- Crying
- Wheezing
- Mumbling

Speech Sounds

Speech Sounds include pain rating responses from 0 to 10, various phrases, and a series of other utterances. Sounds will play in either a male or female voice based on the gender selected at the start of the simulation. Unlike vocal speech sounds, these speech sounds are not continuous and play only once when selected.

To play a Speech Sound, tap on the **Speech** button on the Run screen. Predefined phrases are arranged in Vocal Sound, Conversation, and Symptom categories. Select a desired sound or phrase by tapping on that button in the menu under **Speech Sounds**.

Default: OFF

Vocal Sound:

- Loud cough
- Short Loud Cough
- Short Soft Cough
- Grunt
- Soft cough
- Aching
- Dull
- Pressure
- Sharp
- Stabbing
- Ouch
- Scream

When Female gender is selected, the following additional sounds are available:

- Crying
- Gasping
- Mumbling
- Coughing
- Screaming
- Gagging
- Groaning

Conversation:

- No
- Sometimes
- Yes
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 10, 9, 8, 7, 6...

When Female gender is selected, the following additional phrases are available:

- Sorry, I didn't understand
- Is everything OK?
- How much longer?
- I'll try
- Hello
- Yes I am
- Not at the moment
- Don't touch me
- What's happening?
- Yes, thank you
- Good afternoon
- OK
- Could you say that again?

Symptoms:

- I can't breathe
- My belly hurts
- My chest is tight
- My leg hurts
- Ow, that hurts

When Female gender is selected, the following additional phrases are available:

- It's dull (pain)
- It's constant (pain)
- Comes and goes (pain)
- It's pressure (pain)
- A little bit (pain)
- A lot (pain)
- It's sharp (pain)
- It's stabbing (pain)
- It's very hot in here
- My mouth feels tingly
- I can't feel my legs
- It's so cold in here
- It hurts
- I'm feeling dizzy
- My ears are ringing
- My back hurts
- I'm not feeling very well
- My head hurts so much
- I'm feeling well
- Everything looks blurry
- My stomach hurts
- I'm really nervous
- I feel so nauseous
- I'm very tired
- OUCH!
- I feel very weak
- IT HURTS!

APPENDIX B - CONDITION GUIDELINES FOR PROGRAMMING JUNO WITH MAESTRO

This section is intended to help you select conditions to achieve desired vital signs within each programmed state when using the Modeled Physiology option. All four conditions should be programmed into each state in the order presented below:

- Respiratory: Desaturation
- Cardiovascular: Blood Pressure
- Cardiovascular: Heart Rate
- Respiratory: Respiratory Rate

When using multiple conditions (for example, Desaturation + Hypertension + Tachycardia + Tachypnea), physiological regulatory mechanisms such as the baroreceptor reflex and ventilatory control cause compensatory changes within parameters. To achieve the desired vital sign, select one condition level, above (greater) or below (less), to achieve the desired physiological effect.

Respiratory: Desaturation

Desaturation	SpO ₂ Value
Reset	99%
High 90s	97%
Mid 90s	95%
Low 90s	92%
High 80s	87%
Mid 80s	84%
Low 80s	81%
High 70s	78%
Mid 70s	75%
Low 70s	72%
Less than 70	<58%

Cardiovascular: Blood Pressure

Hypertension		Hypotension	
Reset	110s/70s	Reset	110s/70s
Increased	120s/80s	Decreased	100s/70s
Pre-Borderline	130s/80s	Pre-Borderline	100s/60s
Borderline	140s/90s	Borderline	90s/50s
Mild	150s/90s	Mild	80s/40s
Moderate	160s/100s	Moderate	70s/40s
Severe	170s/100s	Severe	60s/30s
Profound	190s/110s	Profound	50s/30s
Extreme	220s/120s	Extreme	40s/30s

Cardiovascular: Heart Rate

Tachycardia		Bradycardia	
Reset	70s	Reset	70s
Increased	High 70s	Decreased	Mid 60s
Elevated	80s	Pre-Borderline	Low 60s
Pre-Borderline	90s	Borderline	Mid 50s
Borderline	100s	Intermediate	Low 50s
Intermediate	110s	Mild	High 40s
Mild	120s	Moderate	Mid 40s
Moderate	130s	Severe	Low 40s
Severe	140s	Extreme	Mid 30s
Supra	150s	Acute	Low 30s
Profound	160s		
Extreme	170s		
Acute	High 170s		

Respiratory: Respiratory Rate

Tachypnea		Bradypnea	
Reset	11	Reset	11
Increased	15	Increased	10
Elevated	18	Intermediate	9
Borderline	20	Mild	7
Intermediate	22	Moderate	6
Mild	25	Severe	5
Moderate	28	Profound	3
Severe	31	Extreme	2
Profound	33		
Extreme	36		

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APPENDIX C - MEDICATION INFORMATION

The following table describes the medications available for administration in the Maestro software. Each medication is listed along with:

- Any effects on the patient’s physiology (modeled or log-only)
- The medication category
- The predefined dosage choices
- The units used for custom dosages
- The route of administration

When a medication has more than one possible route of administration, it is listed on a separate row for each route.

Medication	Modeled or Log Only	Category	Predefined Dosages	Custom Dosage Options	
				Units	Route
Acetaminophen	L	Analgesic	10mg/kg 15 mg/kg	mg/kg	PO, PR, IV
Adenosine	M	Cardiovascular	0.05 mg/kg 0.1 mg/kg	mg/kg	IV/IO
Albumin 5%	L	Volume Expander	0.5 gram/kg	gram/kg	IV/IO
Albuterol	L	Bronchodilator	0.05 mg/kg 0.10 mg/kg 0.15 mg/kg	mg/kg	Nebulizer
Alprostadil	L	Cardiovascular	0.01 mcg/kg/min 0.05 mcg/kg/min 0.1 mcg/kg/min 0.4 mcg/kg/min	mcg/kg/min	IV/IO
Amiodarone	M	Cardiovascular	5 mcg/kg/min 10mcg/kg/min 15mcg/kg/min 5mg/kg	mg/kg mcg/kg/min	IV/IO
Atropine	M	Cardiovascular	0.02 mg/kg 0.04 mg/kg 0.05 mg/kg 0.06 mg/kg	mg/kg	IV/IO, IM, ET
Caffeine Citrate	L	Stimulant	5 mg/kg 10 mg/kg 20 mg/kg 25 mg/kg	mg/kg	IV, PO
Calcium Chloride 10%	L	Cardiovascular	10 mg/kg 20 mg/kg 50 mg/kg/hr	mg/kg mg/kg/hr	IV/IO
Calcium Gluconate	L	Mineral	100mg/kg 200 mg/kg	mg/kg	IV

Medication	Modeled or Log Only	Category	Predefined Dosages	Custom Dosage Options	
				Units	Route
Captopril	L	Cardiovascular	0.01 mg/kg 0.05 mg/kg 0.1 mg/kg	mg/kg	PO
Chloral Hydrate	L	Hypnotic	25 mg/kg 50mg/kg	mg/kg	PO, PR
Chlorothiazide	L	Diuretic	5 mg/kg 10 mg/kg 20 mg/kg	mg/kg	IV, PO
Curosurf	L	Respiratory	1.25 ml/kg 2.5 ml/kg	mL/kg	ET
Dexamethasone	L	Corticosteroid	0.25 mg/kg 0.5 mg/kg	mg/kg	IV, PO
Dextrose	L	Anti-Hypoglycemic	0.2 gram/kg 1 gram/kg	gm/kg	IV/IO
Diazepam	L	Hypnotic	0.1 mg/kg 0.2 mg/kg 0.3 mg/kg	mg/kg	IV, IM, PO
Digoxin	L	Cardiovascular	6 mcg/kg 8 mcg/kg 10 mcg/kg	mcg/kg	IV, PO
Diphenhydramine	L	Histamine Blocker	1 mg/kg 2 mg/kg	mg/kg	IV/IO, IM, PO
Dobutamine	M	Cardiovascular	2 mcg/kg/min 5 mcg/kg/min 10 mcg/kg/min 20 mcg/kg/min	mcg/kg/min	IV/IO
Dopamine	M	Cardiovascular	2 mcg/kg/min 5 mcg/kg/min 10 mcg/kg/min 20 mcg/kg/min	mcg/kg/min	IV/IO
Enalapril	L	Cardiovascular	0.04 mg/kg 0.1 mg/kg	mg/kg	PO
Enalaprilat	M	Cardiovascular	5 mcg/kg 10 mcg/kg	mcg/kg	IV
Epinephrine 1:10,000	M	ACLS/Cardiovascular	0.01 mg/kg (IV, IO) 0.05 mg/kg (ET) 0.1 mg/kg (ET)	mg/kg mcg/kg/min	IV,IO, ET
Esmolol	M	Cardiovascular	25 mcg/kg/min 50 mcg/kg/min 100 mcg/kg/min	mcg/kg/min	IV
Etomidate	M	Hypnotic	0.2 mg/kg 0.4 mg/kg	mg/kg	IV/IO

Medication	Modeled or Log Only	Category	Predefined Dosages	Custom Dosage Options	
				Units	Route
Fentanyl	M	Narcotic	1 mcg/kg 2 mcg/kg 3 mcg/kg 4 mcg/kg 1 mcg/kg/hr 2 mcg/kg/hr 3 mcg/kg/hr 4 mcg/kg/hr 5 mcg/kg/hr	mcg/kg mcg/kg/hr	IV
Flumazenil	L	Antagonist	0.01 mg/kg	mg/kg	IV
Furosemide	L	Diuretic	1 mg/kg 2 mg/kg	mg/kg	IV, IM
Hydralazine	L	Cardiovascular	0.1 mg/kg 0.2 mg/kg	mg/kg	IV, IM
Hydrocortisone	L	Corticosteroid	1 mg/kg 2 mg/kg 3 mg/kg 4 mg/kg 5 mg/kg	mg/kg	IV
Indomethacin	L	Prostaglandin Inhibitor	0.1 mg/kg 0.2 mg/kg	mg/kg	IV
Infasurf	L	Respiratory	3 ml/kg	mL/kg	ET
Insulin	L	Hormone	0.05 u/kg 0.1 u/kg	units/kg	IV
Ipratropium bromide	L	Respiratory	25 mcg/kg/dose 175 mcg/dose	mcg mcg/kg	Nebulizer
Isoproterenol	M	Cardiovascular	0.05 mcg/kg/min 0.1 mcg/kg/min 0.15 mcg/kg/min 2 mcg/kg/min	mcg/kg/min	IV
Lidocaine	M	Cardiovascular	0.5 mg/kg 1.0 mg/kg 2 mg/kg 20 mcg/kg/min	mg/kg mcg/kg/min	IV/IO
Lorazepam	L	Hypnotic	0.05 mg/kg 0.1 mg/kg	mg/kg	IV
Magnesium Sulfate	L	ACLS	25 mg/kg 50 mg/kg	mg/kg	IV/IM
Mannitol	L	Diuretic	0.5 gm/kg 1.0 gm/kg	gm/kg	IV
Meperidine	L	Narcotic	0.2 mg/kg 0.5 mg/kg	mg/kg	IV, IM, PO, SQ
Methadone	L	Narcotic	0.05 mg/kg 0.1 mg/kg	mg/kg	PO, SC, IM, IV
Methylprednisolone	L	Corticosteroid	1 mg/kg	mg/kg	IV/IO, IM

Medication	Modeled or Log Only	Category	Predefined Dosages	Custom Dosage Options	
				Units	Route
Midazolam	M	Hypnotic	0.05 mg/kg 0.1 mg/kg 0.15 mg/kg 1 mcg/kg/min	mg/kg mcg/kg/min	IV
Milrinone	L	Vasodilator	50 mcg/kg 0.25 mcg/kg/min 0.5 mcg/kg/min 0.75 mcg/kg/min	mcg/kg mcg/kg/min	IV/IO
Morphine	M	Narcotic	0.05 mg/kg 0.1 mg/kg 0.01 mg/kg/hr 0.02 mg/kg/hr	mg/kg mg/kg/hr	IV
Naloxone	M	Antagonist	0.1 mg/kg	mg/kg	IV/IO, ET, IM, SC
Neostigmine	L	Neuromuscular Blockade	0.03 mg/kg 0.05 mg/kg 0.07 mg/kg	mg/kg	IV
Nitroglycerin	L	Cardiovascular	0.25 mcg/kg/min 0.5 mcg/kg/min	mcg/kg/min	IV/IO
Nitroprusside	L	Cardiovascular	0.5 mcg/kg/min 1.0 mcg/kg/min 2.0 mcg/kg/min	mcg/kg/min	IV/IO
Norepinephrine	L	Cardiovascular	0.05 mcg/kg/min 0.1 mcg/kg/min	mcg/kg/min	IV/IO
Pancuronium	L	Neuromuscular Blockade	0.05 mg/kg 0.1 mg/kg	mg/kg	IV
Phenobarbital	L	Hypnotic	3 mg/kg 5 mg/kg 15 mg/kg 20 mg/kg	mg/kg	IV, IM, PO
Phenylephrine	L	Cardiovascular	0.1 mcg/kg/min 0.5 mcg/kg/min	mcg/kg/min	IV
Phenytoin	L	Anticonvulsant	5 mg/kg 15 mg/kg 20 mg/kg	mg/kg	IV, PO
Procainamide	M	Cardiovascular	7 mg/kg 10 mg/kg 20 mcg/kg/min 40 mcg/kg/min 80 mcg/kg/min	mg/kg mcg/kg/min	IV/IO
Propranolol	L	Cardiovascular	0.01 mg/kg 0.1 mg/kg 0.15 mg/kg 0.25 mg/kg	mg/kg	IV, PO
Racemic Epi	L	Bronchodilator	0.25 ml	mL	IN
Rocuronium	L	Neuromuscular Blockade	0.4 mg/kg 0.5 mg/kg 0.6 mg/kg	mg/kg	IV/IO

Medication	Modeled or Log Only	Category	Predefined Dosages	Custom Dosage Options	
				Units	Route
Sodium Bicarbonate 4.2%	L	Cardiovascular	1m Eq/kg 2m Eq/kg	mEq/kg	IV, IO
Succinylcholine	M	Neuromuscular Blockade	2 mg/kg	mg/kg	IV
Survanta	L	Respiratory	4 ml/kg	mL/kg	ET
Terbutaline	L	Respiratory	2 mcg/kg 10 mcg/kg 0.1 mcg/kg/min	mg/kg mcg/kg/min	IV/IO
Theophylline	L	Bronchodilator	2 mg/kg 5 mg/kg	mg/kg	PO
Vasopressin	L	ACLS/Cardiovascular	0.1 mu/kg 0.5 mu/kg 0.1 mu/kg/min 0.5 mu/kg/min	milliunits/kg milliunits/kg/min	IV/IO
Vecuronium	L	Neuromuscular Blockade	0.03 mg/kg 0.1 mg/kg 0.15 mg/kg	mg/kg	IV

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APPENDIX D - CAE MAESTRO MULTISIM

MultiSim allows you to control multiple, synchronized CAE Juno simulators from a single instructor device.

Notes:

- Checklists and the intercom features cannot be used when running MultiSim.
- The CPR graph will not appear on the CAE Maestro Run screen while using MultiSim. The CPR graph will appear only on CAE Patient Monitor.

Setting Up MultiSim

To use the MultiSim feature, the following software and hardware is required:

- CAE Maestro v1.8 software or later

Note: If you have an earlier version of Maestro, you must update it to version 1.8 or later. To update Maestro, go to <https://caehealthcare.com/support/software-updates/> and follow the on-screen instructions. The *Installing Maestro Updates* guide is also available on the website.
- Samsung Galaxy S3 or Surface Go tablet
- Two to 10 Juno simulators
- Linksys WRT3200ACM central router (purchased from and preconfigured by CAE)

Setup Steps	
1	Configure simulators
2	Configure tablets
3	Connect simulators in MultiSim

Step 1: Configure Simulators

Each simulator and its associated tablet must be configured to communicate with the central router.

To configure each simulator:

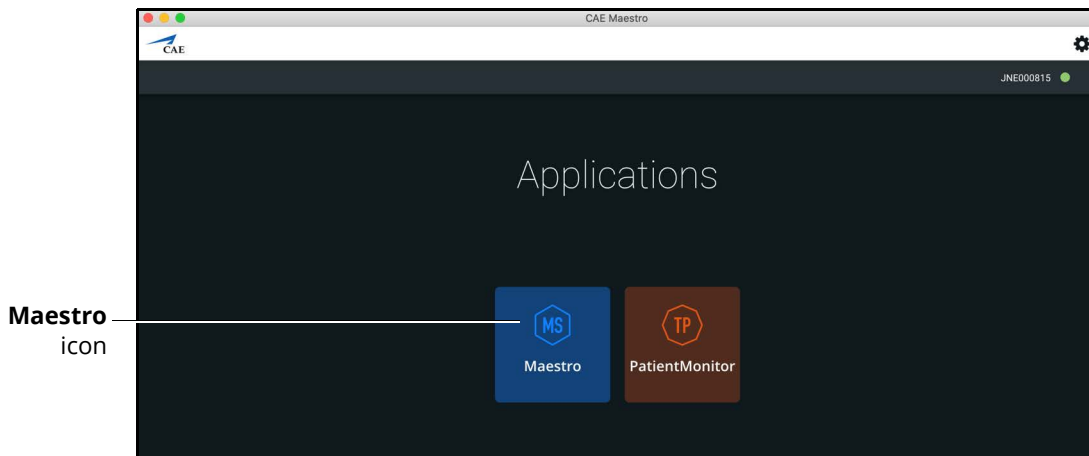
- a. Power on the router and ensure the antenna is attached.

- b. On the tablet, tap the **CAE Maestro** icon.



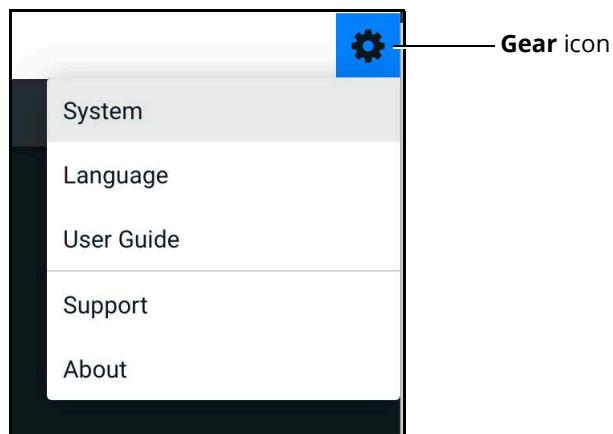
CAE Maestro Icon

- c. On the Application Home screen, tap **Maestro**.



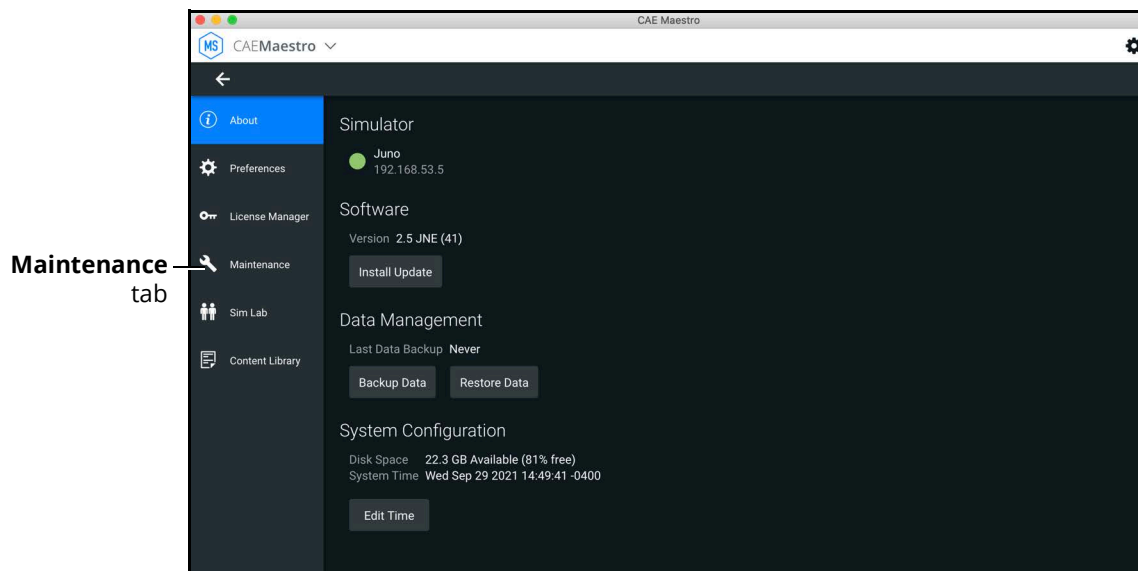
Application Homescreen

- d. On the CAE Maestro Home screen, tap the **Gear** icon in the upper-right corner, then select **System**.



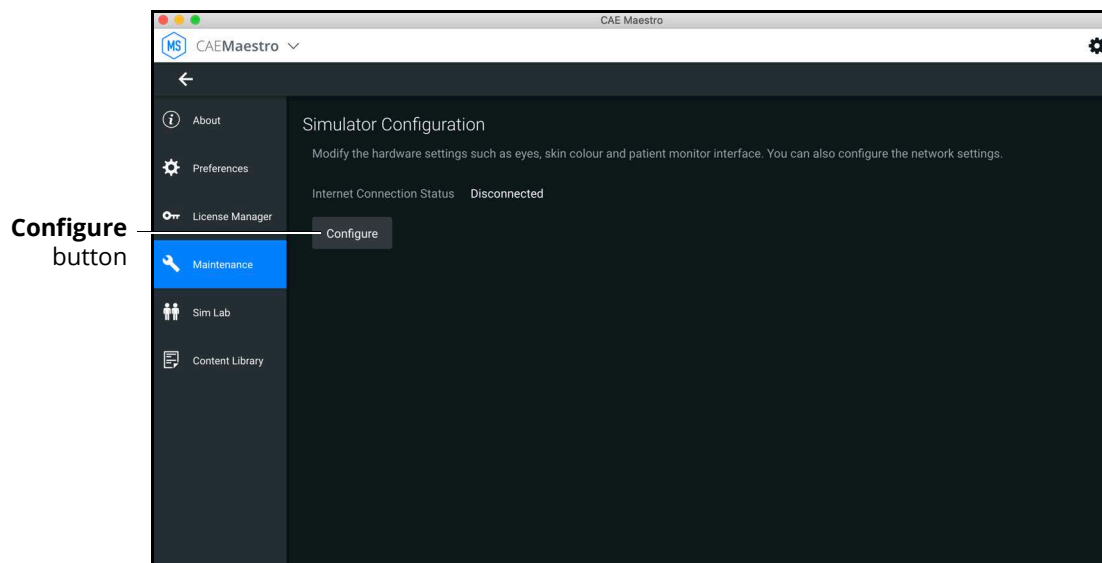
Gear Icon Menu

The Simulator screen appears.



Simulator Screen

- e. Tap the **Maintenance** tab to display the Simulator Configuration screen and tap the **Configure** button.

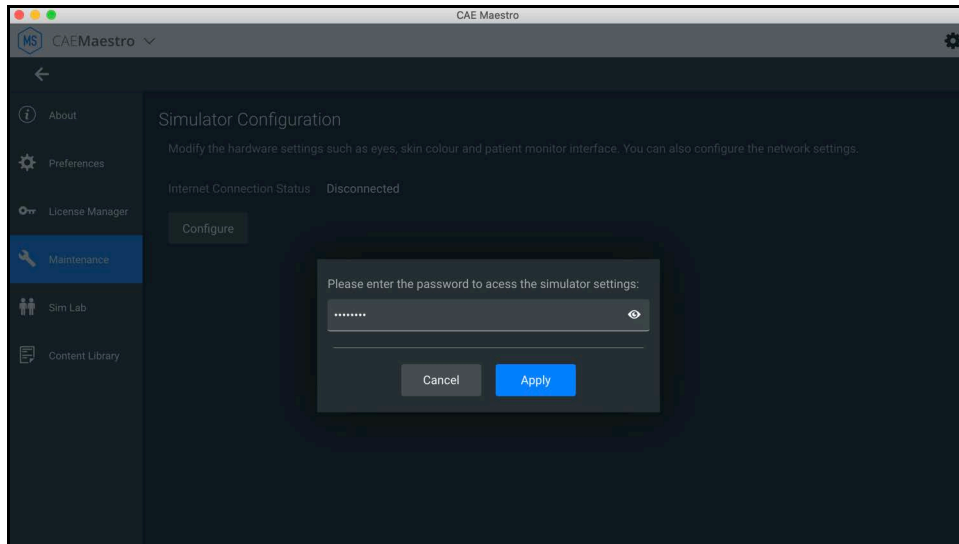


Simulator Configuration Screen

The password entry panel appears.

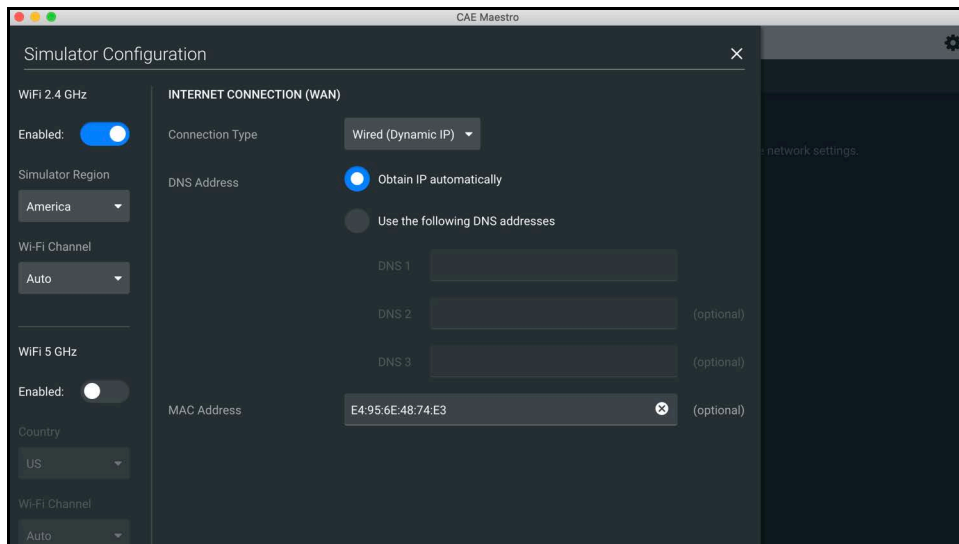
- f. Type the password: caeadmin (tap the **Eye** icon to confirm the password is entered correctly).

- g. Tap **Apply**.



Password Entry Panel

The Internet Connection (WAN) panel appears.



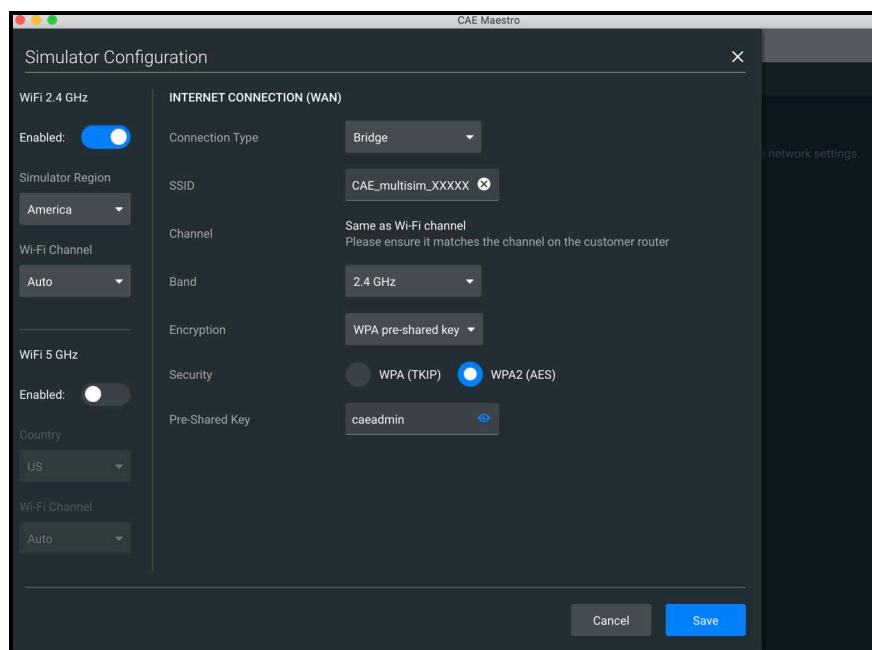
Internet Connection (WAN) Panel

- h. Select or change the following settings in order. As you select settings, additional settings appear.

IMPORTANT: Select or type the following information exactly as it is shown.

- Connection Type: Select **Bridge**.
- SSID: **CAE_multisim_XXXXX** (the specific SSID - e.g. CAE_multisim_04663, is located on the bottom of the router).
- Encryption: **WPA pre-shared key**.
- Security: **WPA2 (AES)**.
- Pre-Shared Key: **caeadmin**.

The following image shows completed information for a CAE router connection.



Internet Connection Settings Completed

IMPORTANT: In the left panel, ensure the WiFi Channel is set to Auto. Tap the **Eye** icon to confirm the password is entered correctly.

- i. Tap **Save**.

IMPORTANT: If you inadvertently selected or entered incorrect settings, the simulator will not be able to connect to the router. This will disable your simulators. In that event, see *“Re-establish a Network Connection” on page 169*.

The Restart Required dialog box appears.

- j. Tap **Restart** and continue the configuration process in *Step 2: Configure a Tablet*.

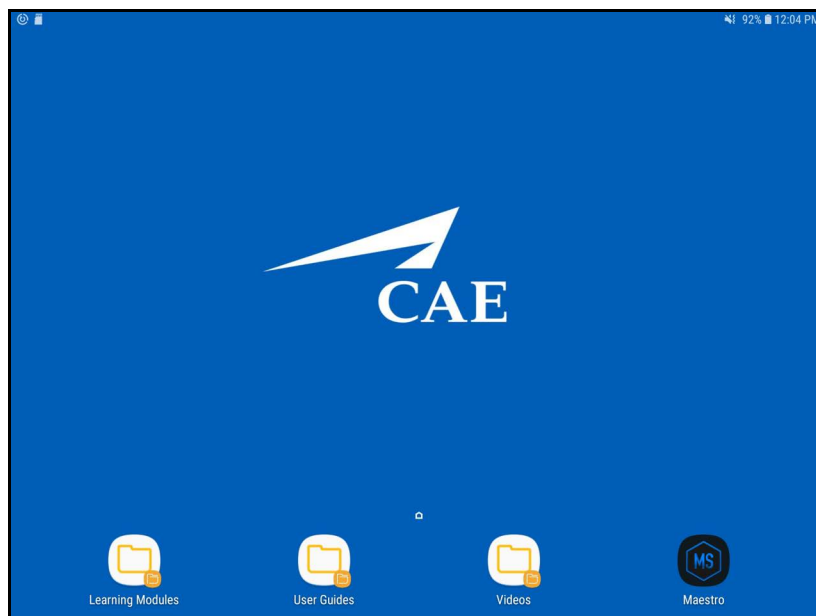
Step 2: Configure a Tablet

Follow the instructions to connect the tablet provided with your simulator to the MultiSim router and configure the application to the associated simulator.

Samsung Tablet

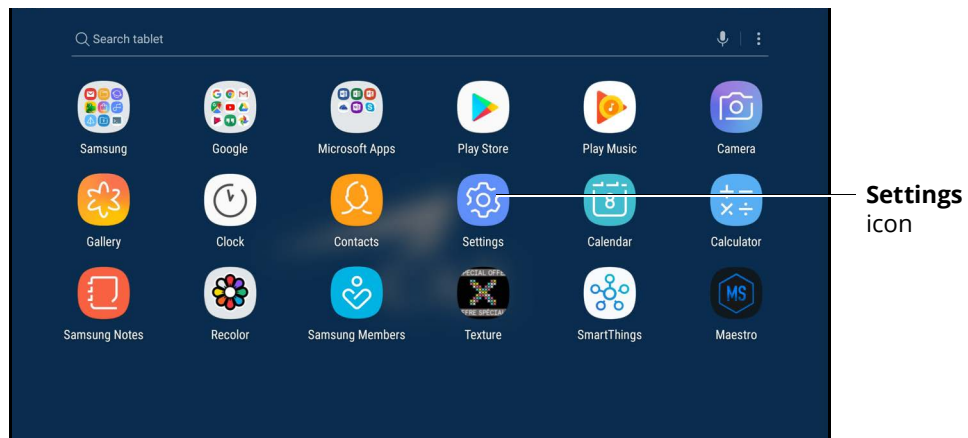
To configure a Samsung Tablet:

- a. On the tablet, press the **Home** button.
The Samsung Home screen appears.



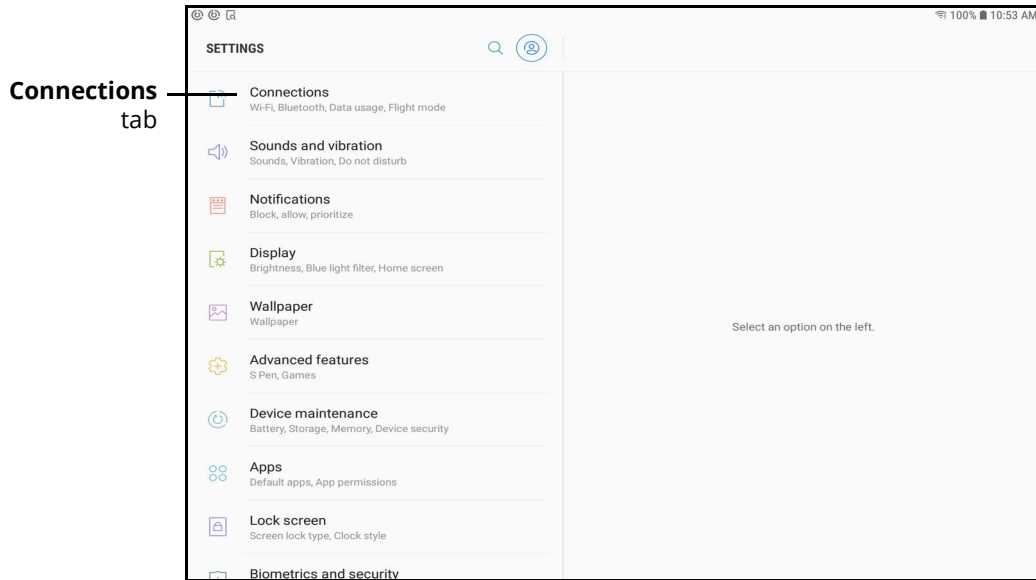
Samsung Tablet Home Screen

- b. On the screen, swipe the screen up to display the Search tablet screen.



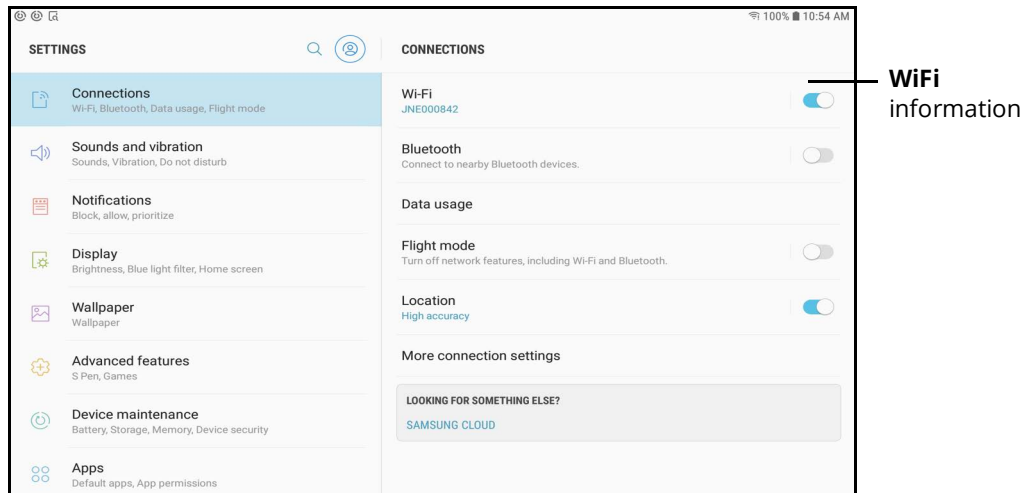
Search Tablet Screen

- c. Tap the **Settings** icon.
The Settings screen appears.



Settings Screen

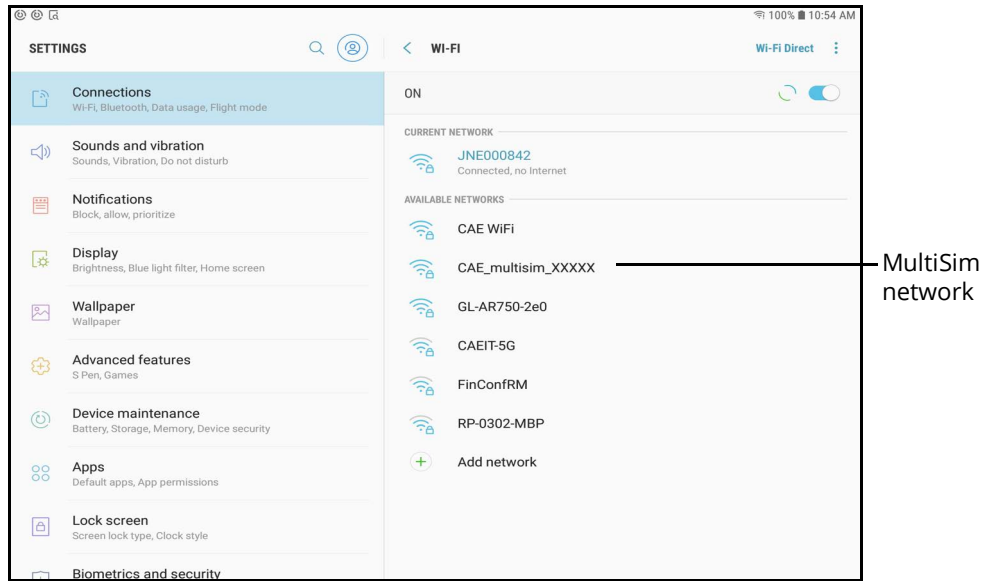
- d. Tap **Connections** tab to view connections settings.



Settings - Connections Screen

- e. Tap **WiFi** to view available networks.

The list of available networks appears.

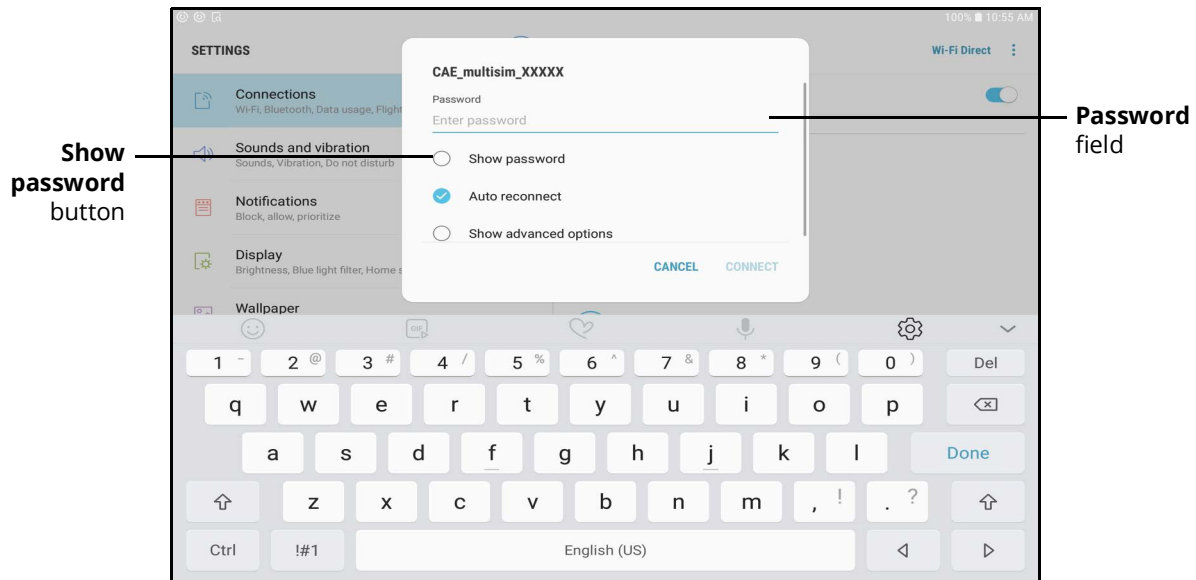


Settings - WiFi Screen

- f. Tap **CAE_multisim_XXXXX**.

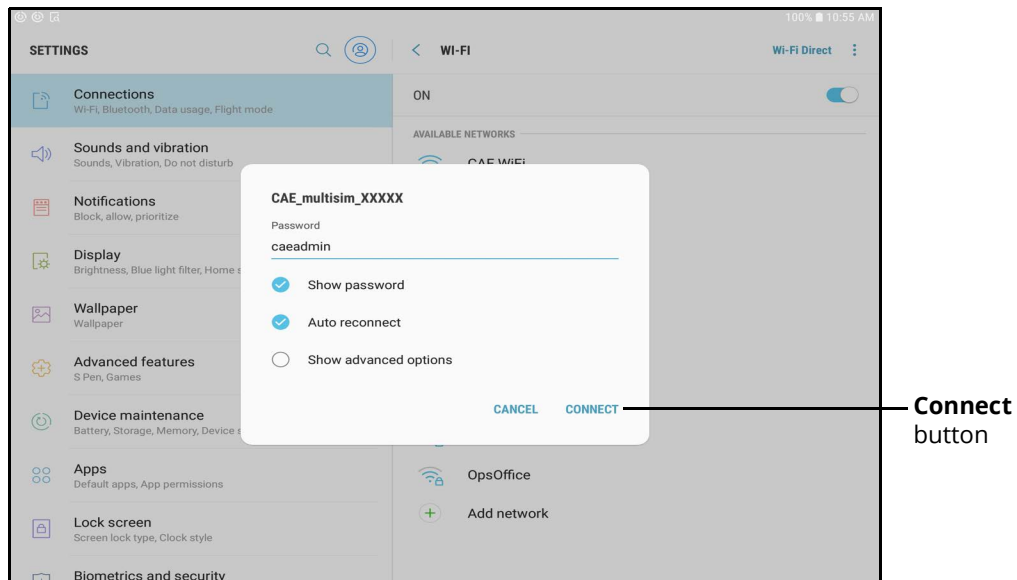
Note: The XXXXX in the CAE MultiSim network name is a placeholder for the digits found on the bottom of the router.

The password prompt window appears.



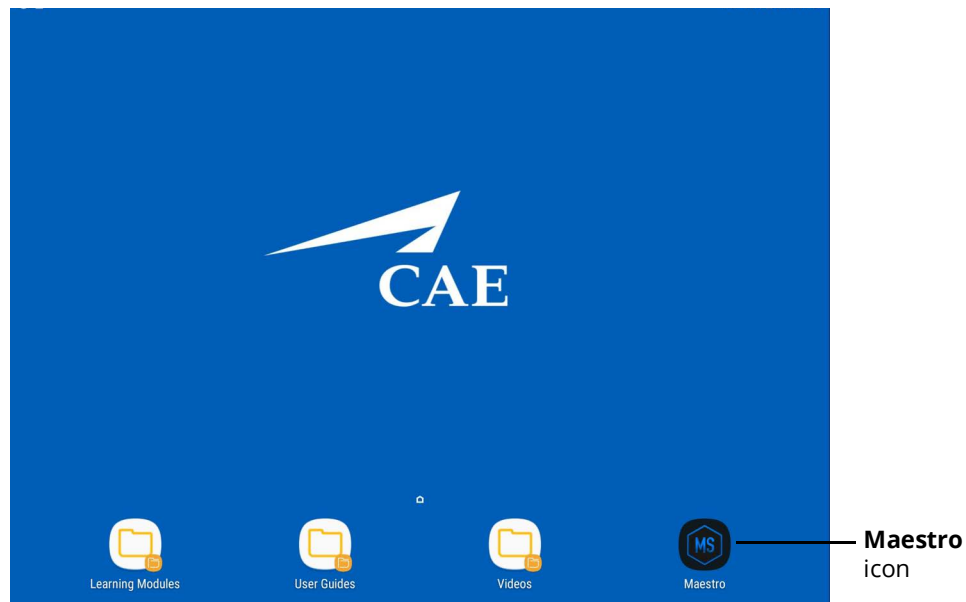
Password Prompt

- g. Tap the **Show Password** radio button and enter the password *caeadmin*.



Password Prompt

- h. Tap **Connect**.
- i. Press the **Home** button on the tablet.
The Samsung Home screen appears.



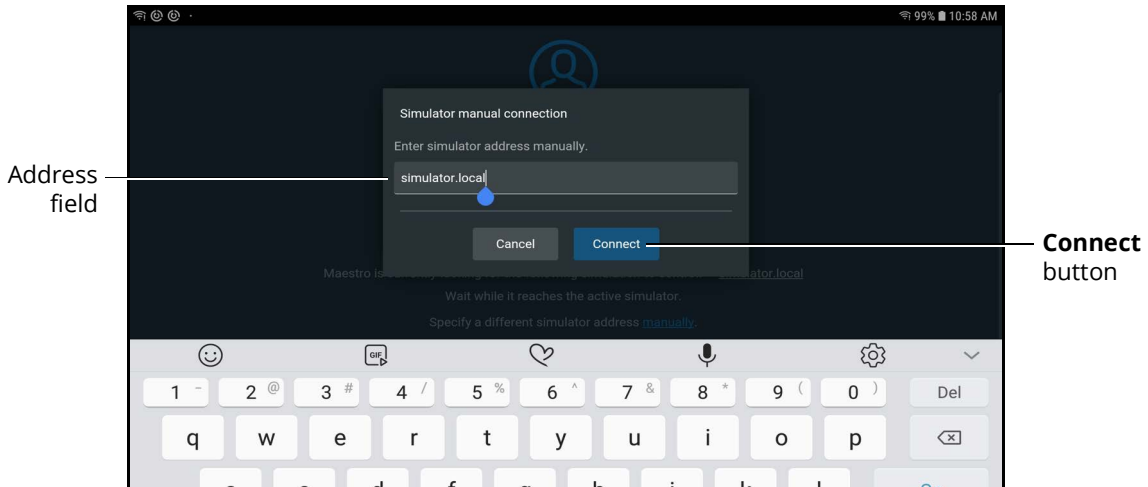
Samsung Tablet Home Screen

- j. From the Home screen, tap the **Maestro** icon.
The CAE Maestro app launches.

- k. While the connection is being made, tap the **manually** link at the bottom of the screen.

Note: If a message appears that the connection to Maestro failed, tap **Modify address**.

The Simulator Manual Connection prompt opens.

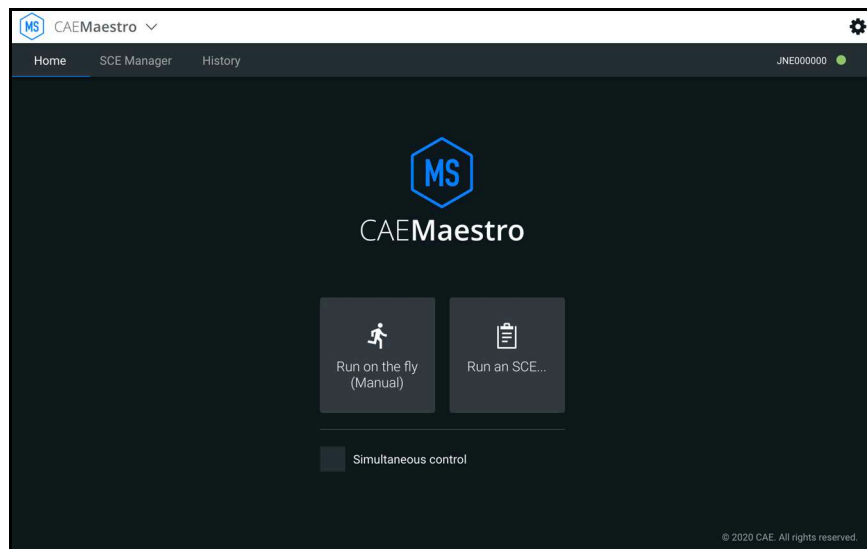


Simulation Manual Connection Prompt

- l. In the Address field, replace “simulator.local” with the simulator serial number associated with the tablet. Tap **Connect**.

Note: The CAE serial number is located on the back of the tablet. (Example: JNE000527)

The Maestro Home page appears.



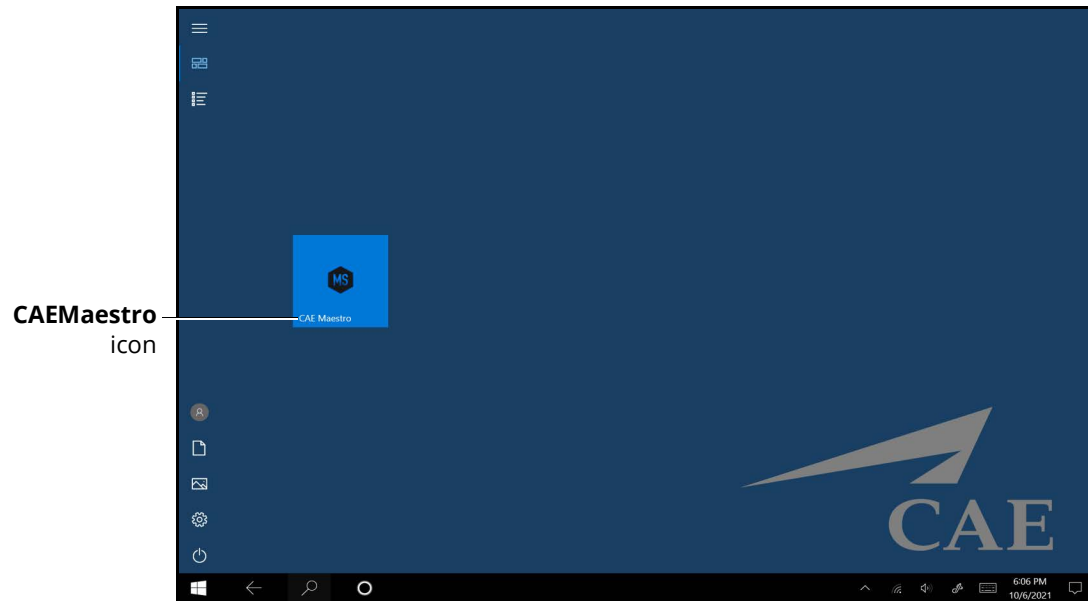
Maestro Home Page

- m. Continue the connection for the Maestro software in *Step 3: Connect Simulators to MultiSim*.

Surface Go Tablet

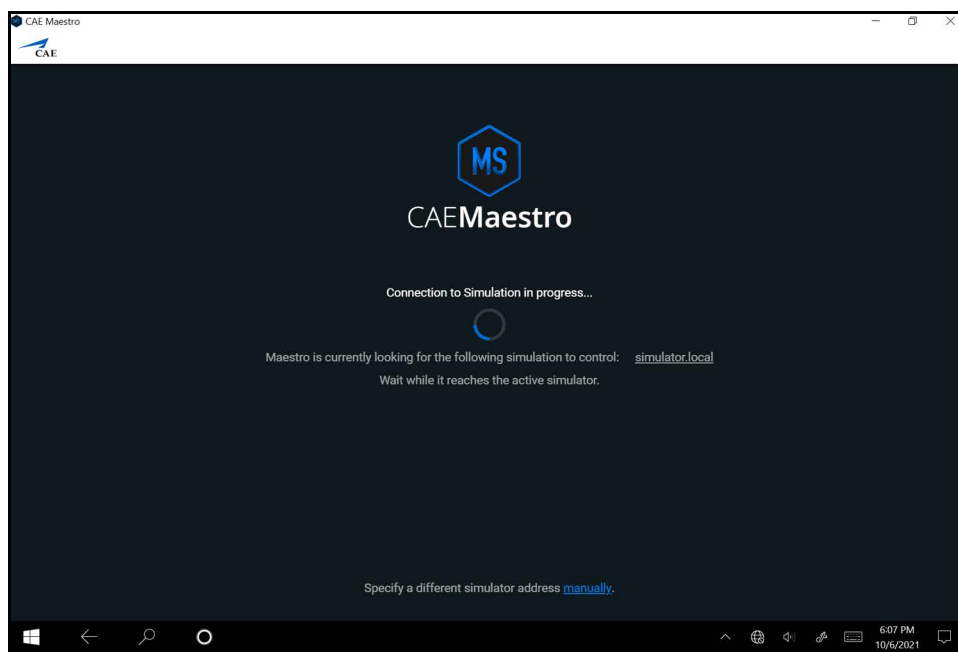
To configure a Surface Go tablet:

- a. From the Surface Go Home screen, tap the **CAEMaestro** icon to launch the app.



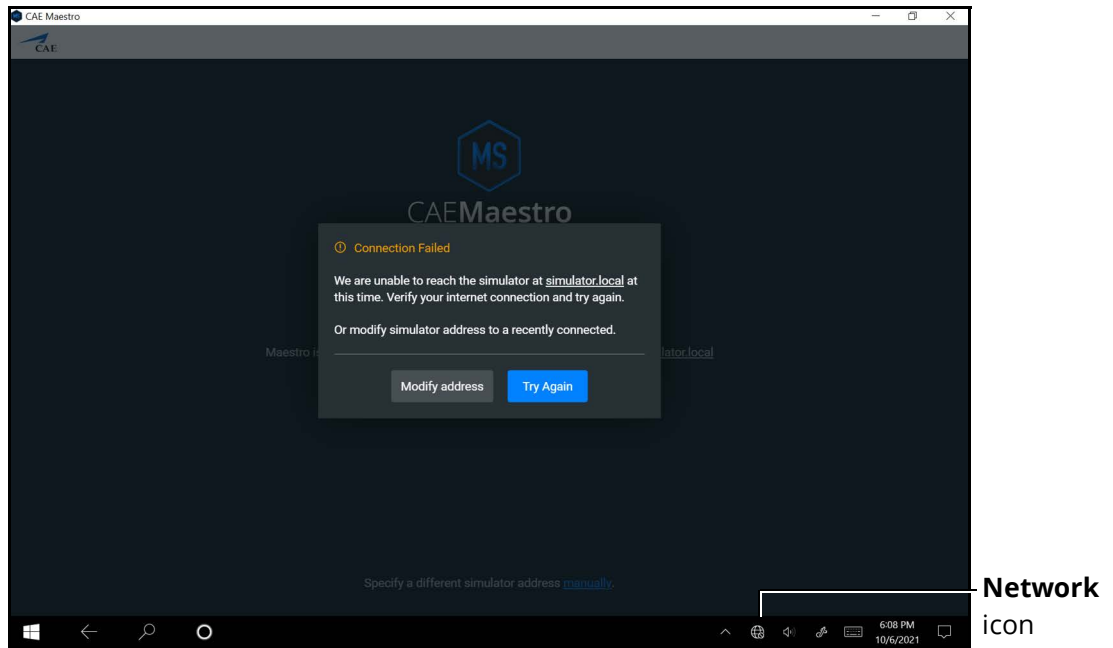
Surface Go Tablet Home Screen

The CAE Maestro Connecting screen appears.



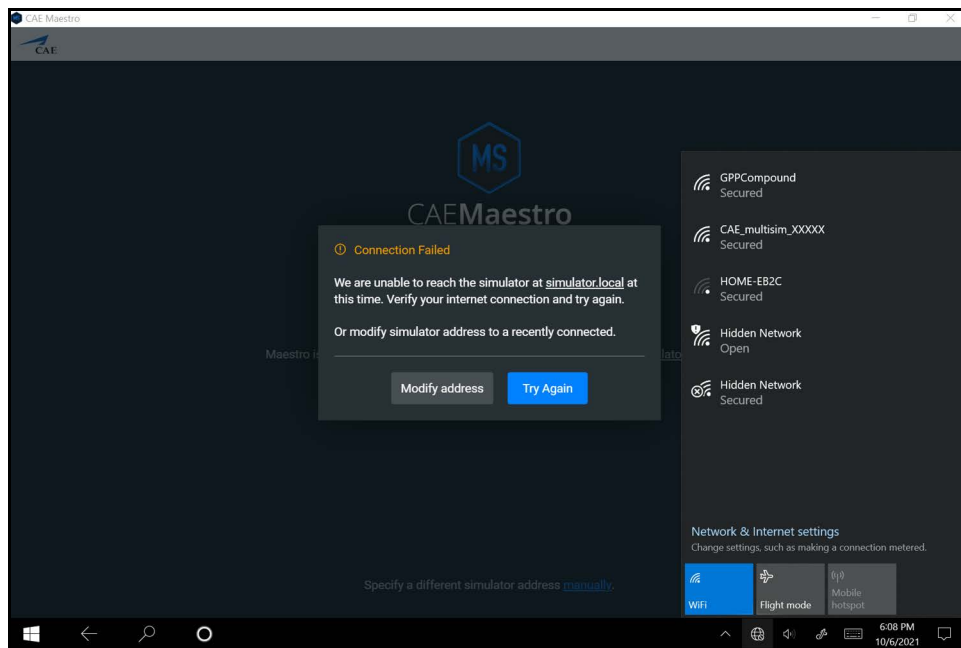
CAE Maestro Connection Screen

The Connection Failed prompt will appear after 30 seconds of attempting to connect.



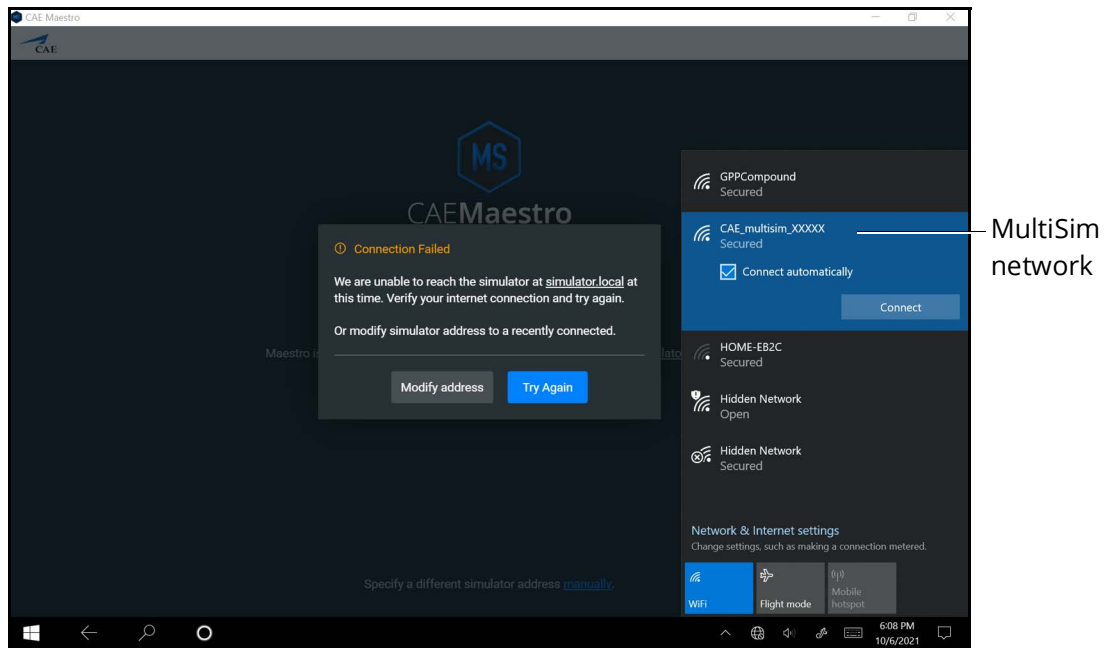
Connection Failed Prompt

- b. Tap the **Network** icon in the Windows taskbar to expand the available networks list.



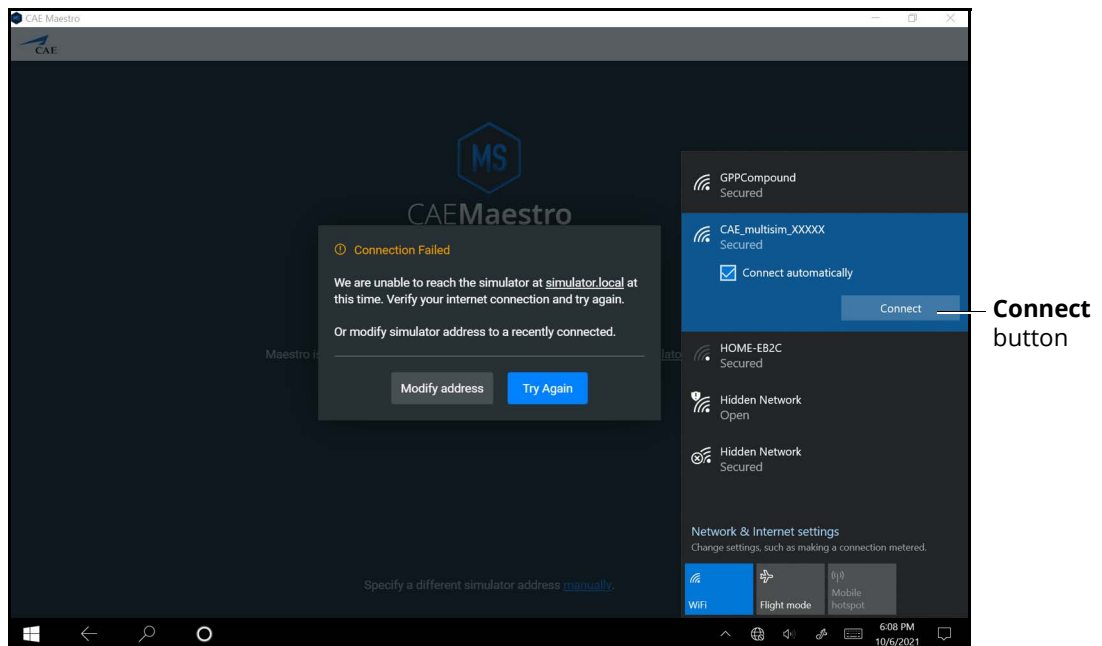
Connection Failed Screen with Networks List

c. Tap CAE_multisim_XXXXX.



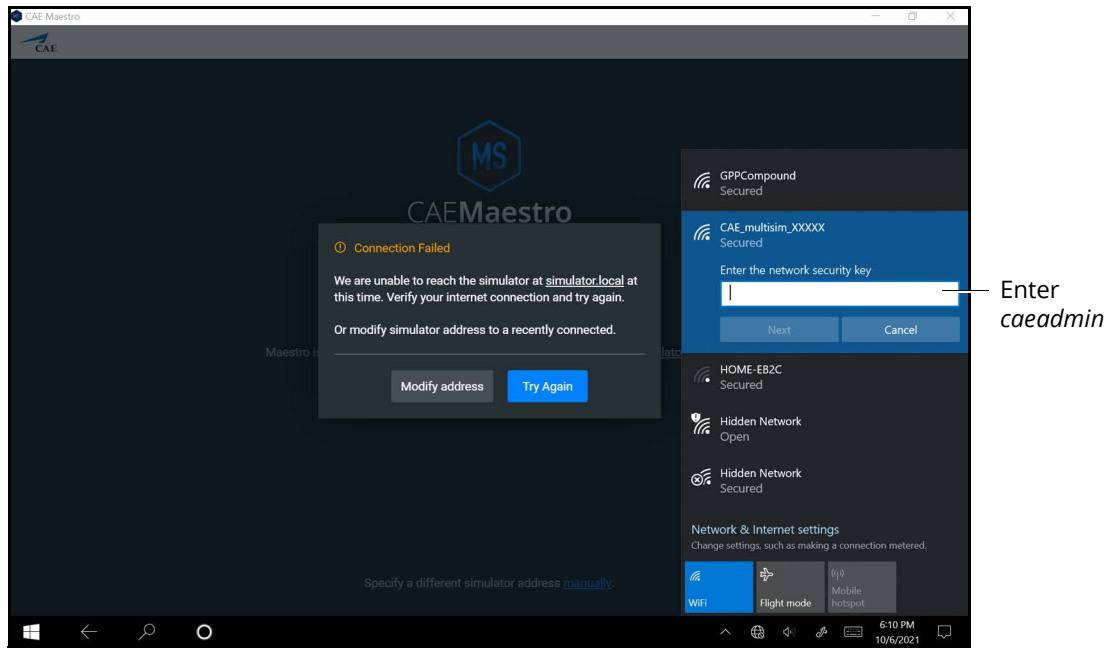
WiFi Connection - MultiSim Network

d. In the CAE_multisim_XXXXX network option, tap the **Connect Automatically** checkbox and then tap the **Connect** button.



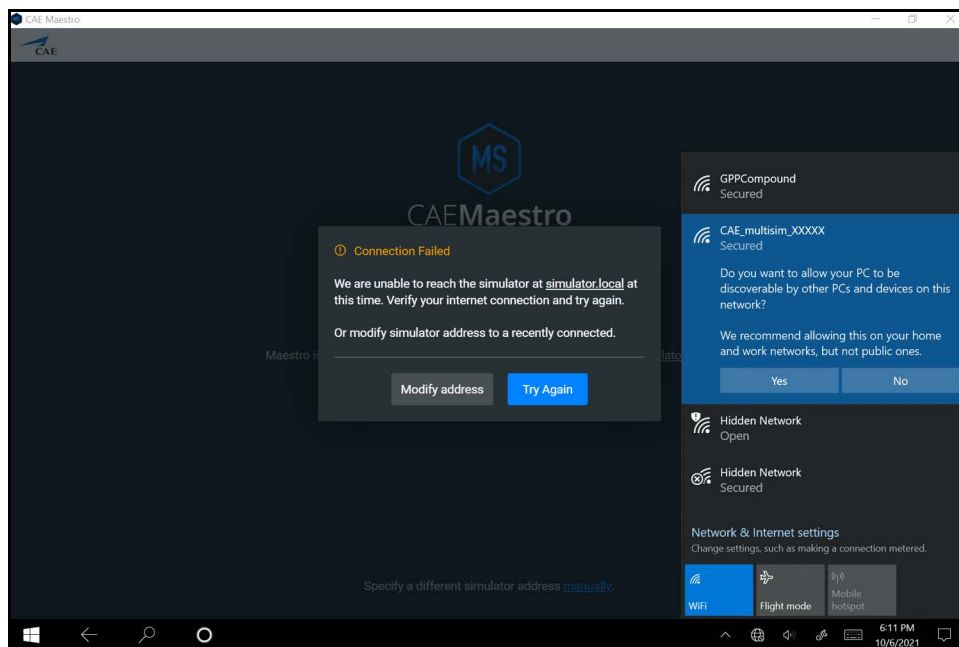
WiFi Connection - MultiSim Network

The network security key prompt appears.



WiFi Connection - Network Security Key Prompt

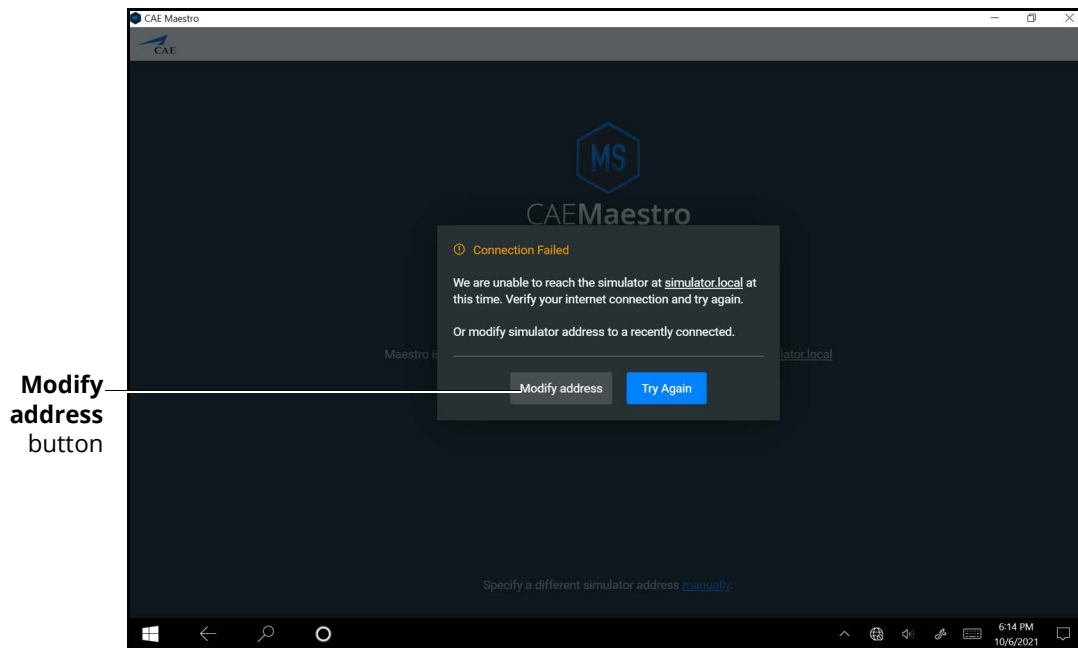
- e. Enter *caeadmin* into the security network key field using the on-screen keyboard.
- f. Tap **Next**.
- g. When the discoverable PC prompt appears, tap **Yes**.



WiFi Connection - Discoverable PC

Note: Tap anywhere on the screen outside of the panels to close the WiFi panel.

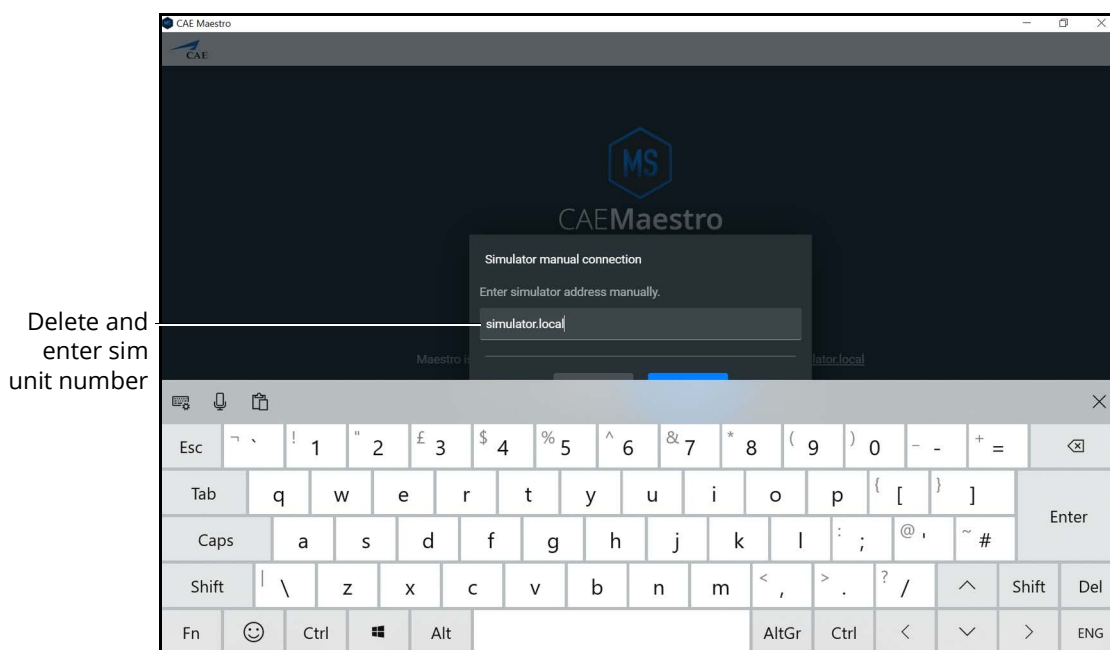
- h. Tap the **Modify address** button.



Connection Failed Prompt

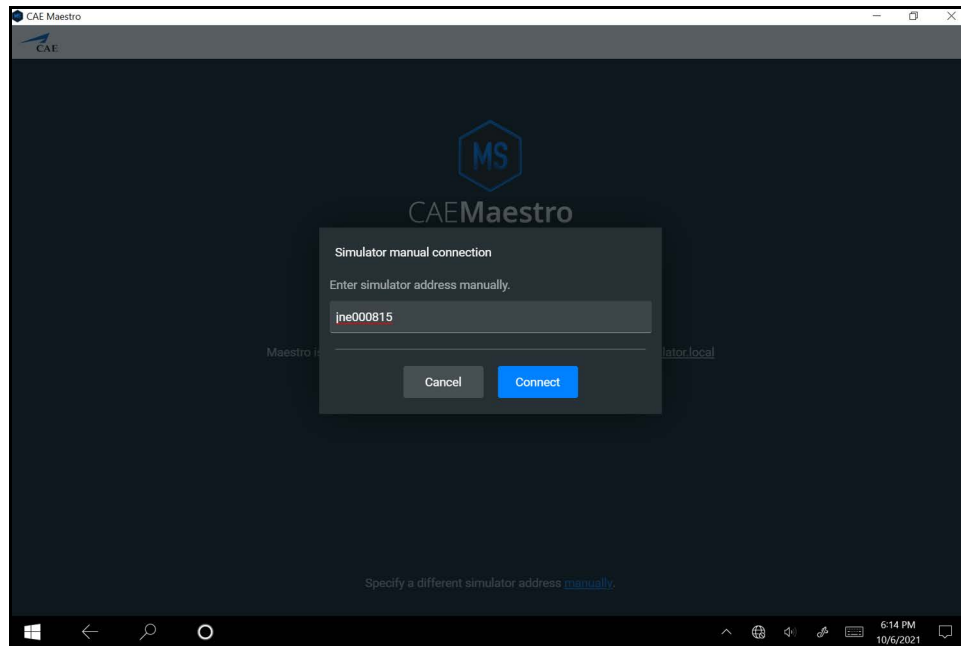
The Simulator manual connection prompt appears.

- i. Using the on-screen keyboard, delete *simulator.local* from the text field and enter the serial number found on the back of the tablet (ex. *JNE000842*).



Manual Connection Entry Panel

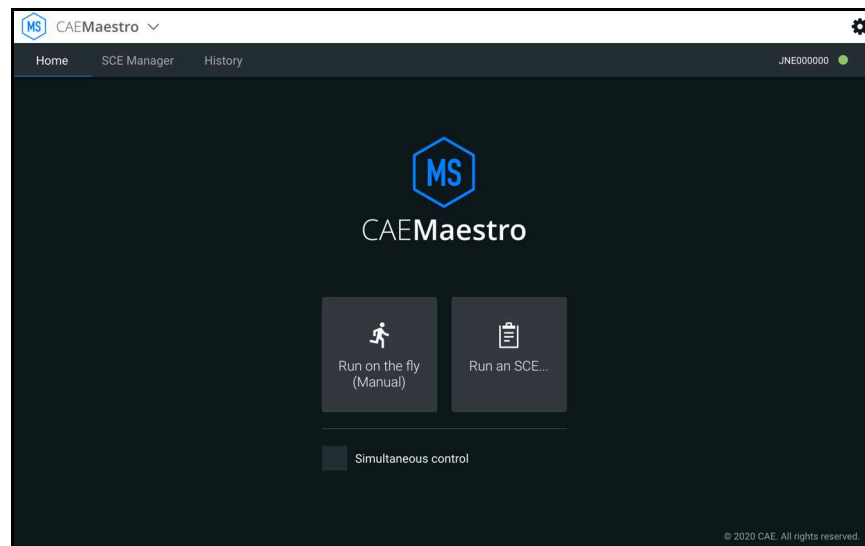
- j. Tap the X in the upper-right corner of the keyboard to exit the keyboard.



Simulator Manual Connection Panel

- k. Tap **Connect**.

The Maestro Home screen appears.



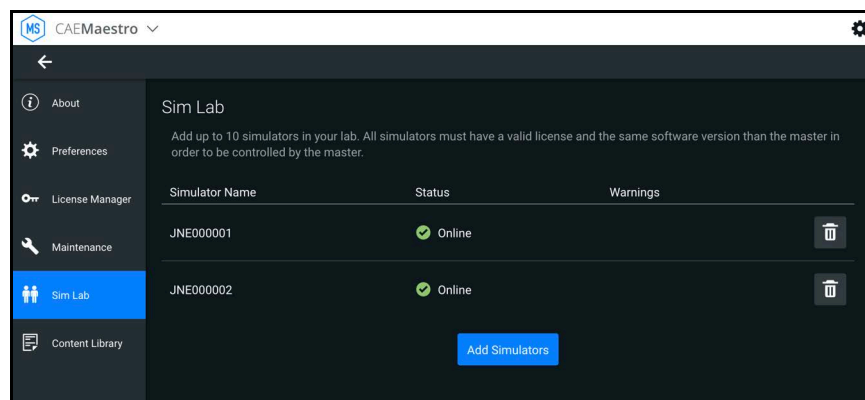
Maestro Home Screen

Step 3: Connect Simulators in MultiSim

Once simulators are configured, connect them in the Sim Lab. This lets you select simulators to run simultaneously.

To add simulators in the Sim Lab:

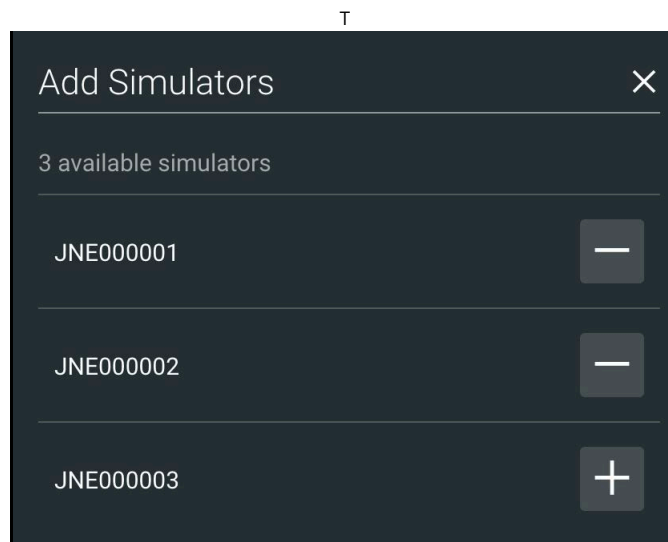
- a. From the Maestro Home screen, tap the **Gear** icon and from the drop-down menu, tap **System**.
- b. Tap **Sim Lab** tab.
- c. On the Sim Lab screen, tap **Add simulators**.



Sim Lab Screen

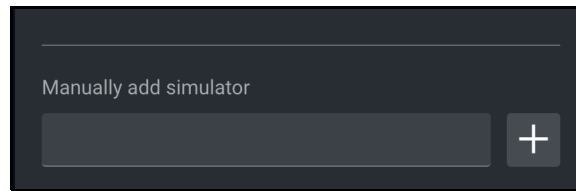
A list of configured simulators appears.

- d. Tap the plus sign (+) next to each simulator you want to add.
Once added, the plus sign becomes a minus sign (-). Tap the minus sign to remove the simulator from the lab.



Add Simulators Screen

- e. (Optional) You can add a simulator not included in the list if you know the IP address of the simulator. In the **Manually add simulator** field at the bottom of the screen, type the IP address, then tap the plus sign.



Manually Add Simulator

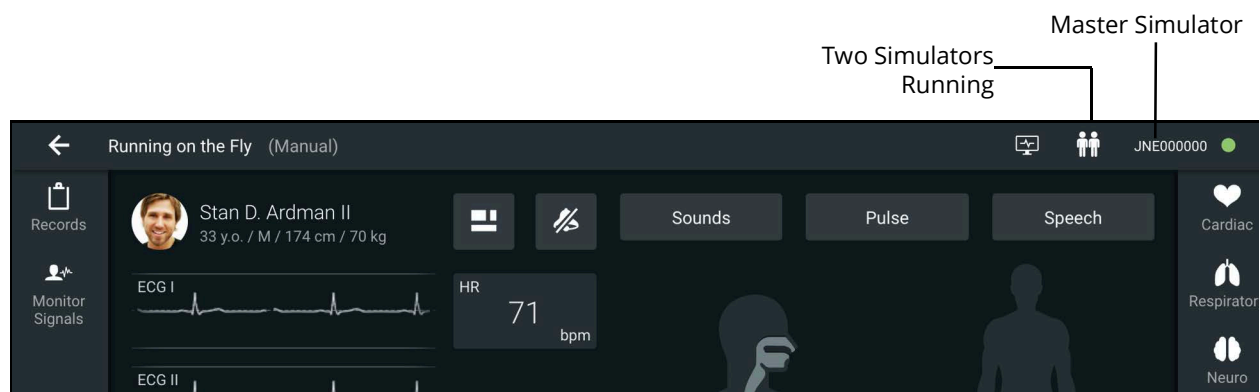
Using MultiSim

The MultiSim feature provides views and options that differ from running simulations without MultiSim. This section describes only those views and options using MultiSim.

Run a Simulation

The tablet and simulator from which you run all simulations is designated as the “master” simulator. The screen displays a list of simulators included in the simulation, but vitals and patient information will appear only for the master simulator. Any changes made to the master simulator (such as parameters, conditions, sounds, pulse, etc.) will apply to all simulators.

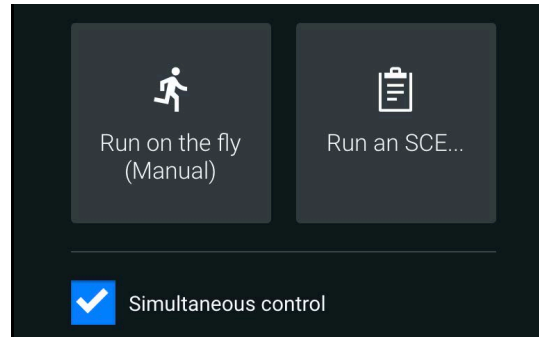
Example: Two simulators are configured to run a simulation (JNE000001 and JNE000002). You run the simulations from JNE000001’s tablet, which becomes master. You will see two simulators running, and data displaying for only the JNE000001 simulator. Any changes made to the master will apply to JNE000002.



Master Simulator View

To run multiple simulators for a session:

1. From the Maestro Home screen, tap to check the box next to **Simultaneous Control**.



Simultaneous Control

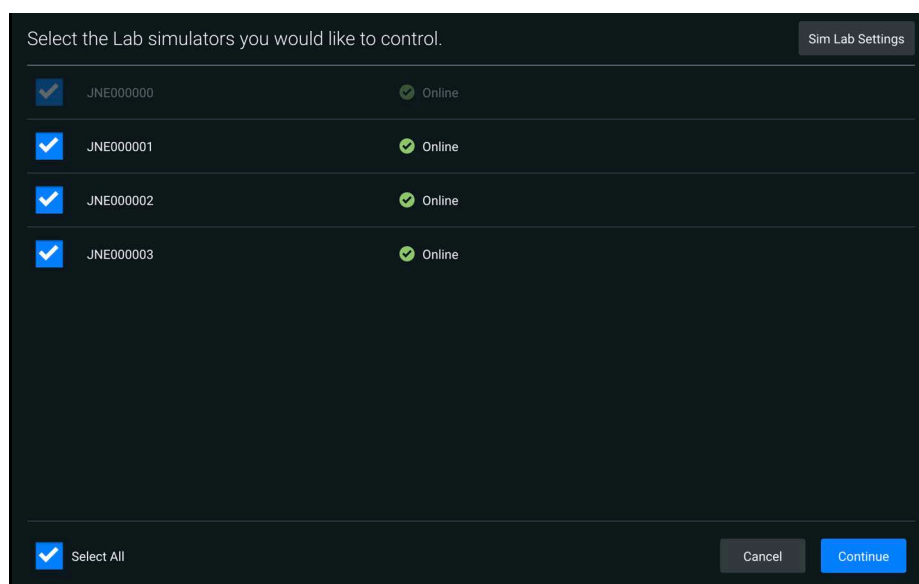
2. Tap an option to run simulations: **Run on the fly (Modeled or Manual)** or **Run an SCE**.
 - If you selected Run on the fly (either mode), you are prompted to select a **Gender**, and then tap **Start**.

OR

- If you selected Run an SCE, tap the **Play** for the desired session.

CAUTION: When running an SCE, if a simulator has another version of the selected SCE, a message appears indicating that the other version will be overwritten. To continue, tap **Overwrite other SCE versions**.

3. From the list of connected simulators (which appear as Online), select two or more to simulators to control, or tap **Select All**.



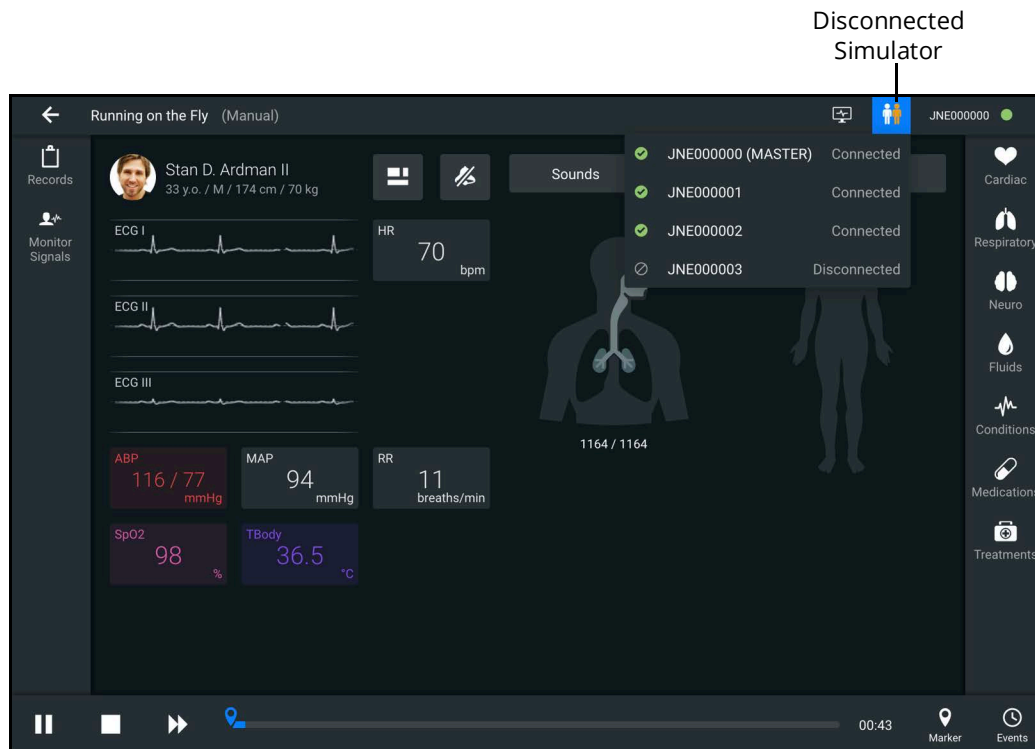
Select Simulators

4. Tap **Continue**.

The Runtime screen appears.

Note: If a simulator disconnects while running a simulation, the simulator icon changes color. This may happen, for example, if the WiFi connection is lost.

To display a list of disconnected simulators, tap the **Simulator** icon.



Runtime Screen

The system will automatically reconnect when it becomes available again.

Setting Up Patient Monitor for MultiSim

To use CAE Patient Monitor(s) in a MultiSim environment, the following software and hardware is required:

- One Juno simulator updated with CAE Maestro v1.8 software or later and already connected to MultiSim network

Note: If you have not connected your simulator to the MultiSim network, refer to the *Setting Up MultiSim* section for further instructions.

- Ethernet cable
- Display monitor(s) (MSI or Lenovo)
- Linksys WRT3200ACM central router (purchased from and preconfigured by CAE)

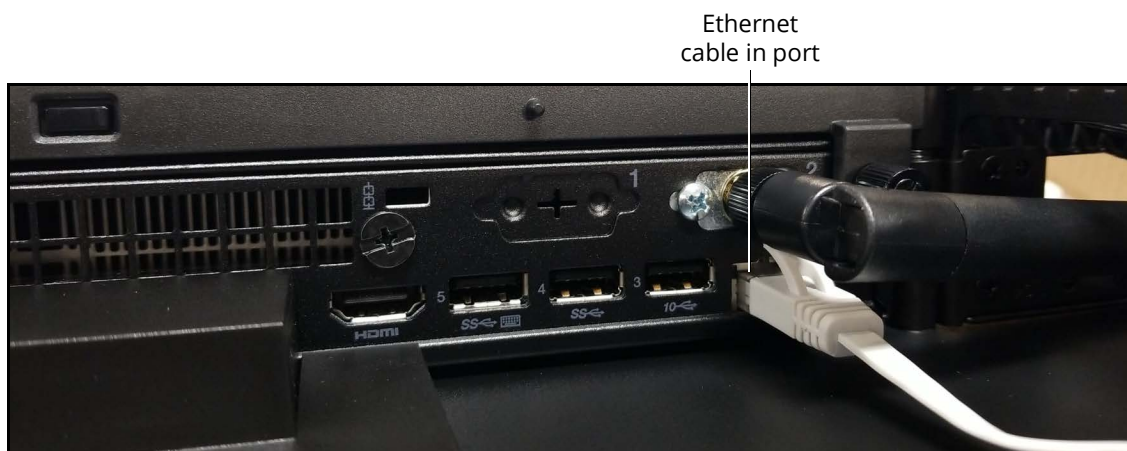
Prior to beginning the Patient Monitor MultiSim setup, complete the steps outlined in the *Patient Monitor Getting Started Guide* provided with the Patient Monitor shipment.

TouchPro MultiSim Setup Steps	
1	Connect Simulator to Patient Monitor
2	Download Maestro App
3	Connect Patient Monitor to MultiSim Network
4	Launch Patient Monitor

Step 1: Connect Simulator to the CAE Patient Monitor

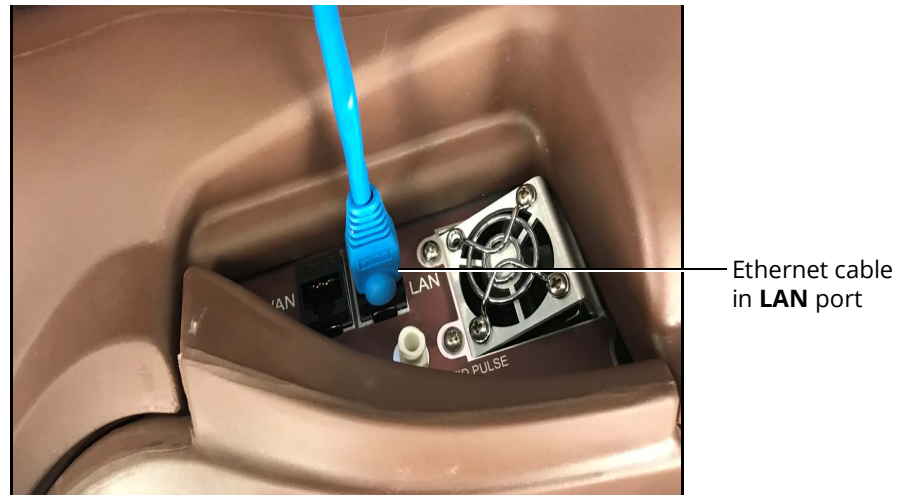
To connect the simulator to Patient Monitor:

- Connect one end of Ethernet cable to back of Patient Monitor.



Lenovo Patient Monitor Connection

- b. Connect other end of Ethernet cable to LAN port on CAE Juno manikin.



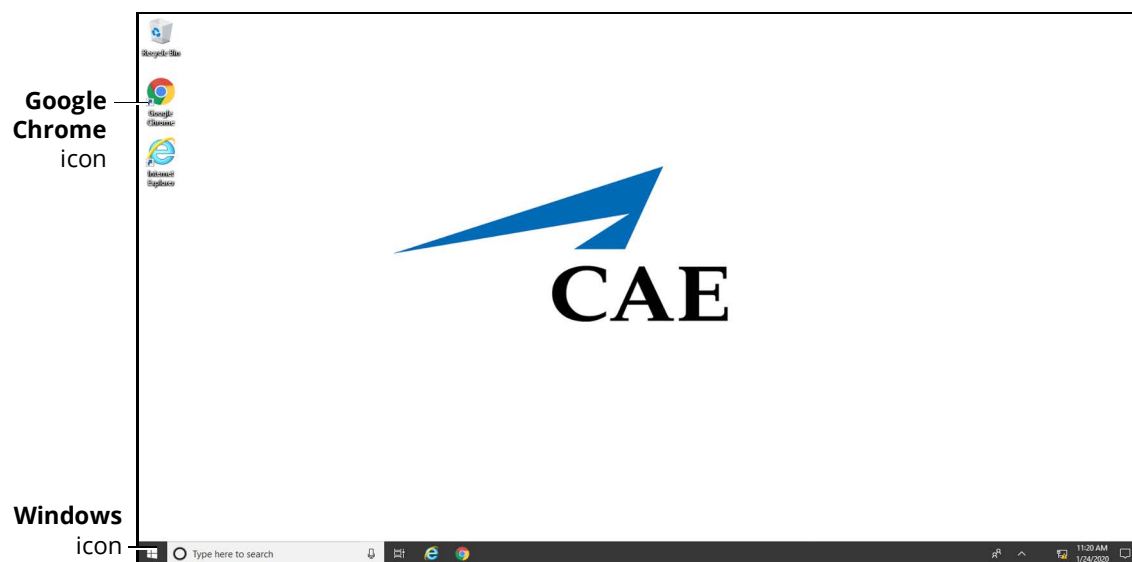
Juno Ethernet Connection

- c. Power on Patient Monitor.

Step 2: Download Maestro App

To download the Maestro app:

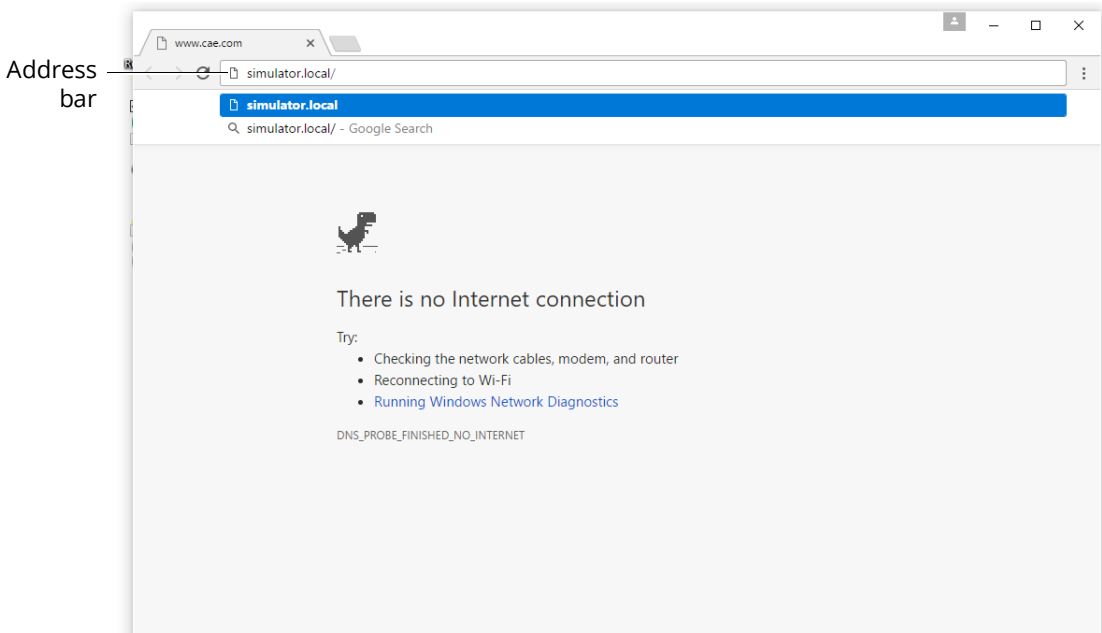
- a. From the Patient Monitor desktop screen, tap the **Google Chrome** icon to launch Google Chrome browser. If the icon is not on the desktop, tap the Windows icon to search the Start Menu for it.



Patient Monitor Desktop

The Google Chrome browser window appears.

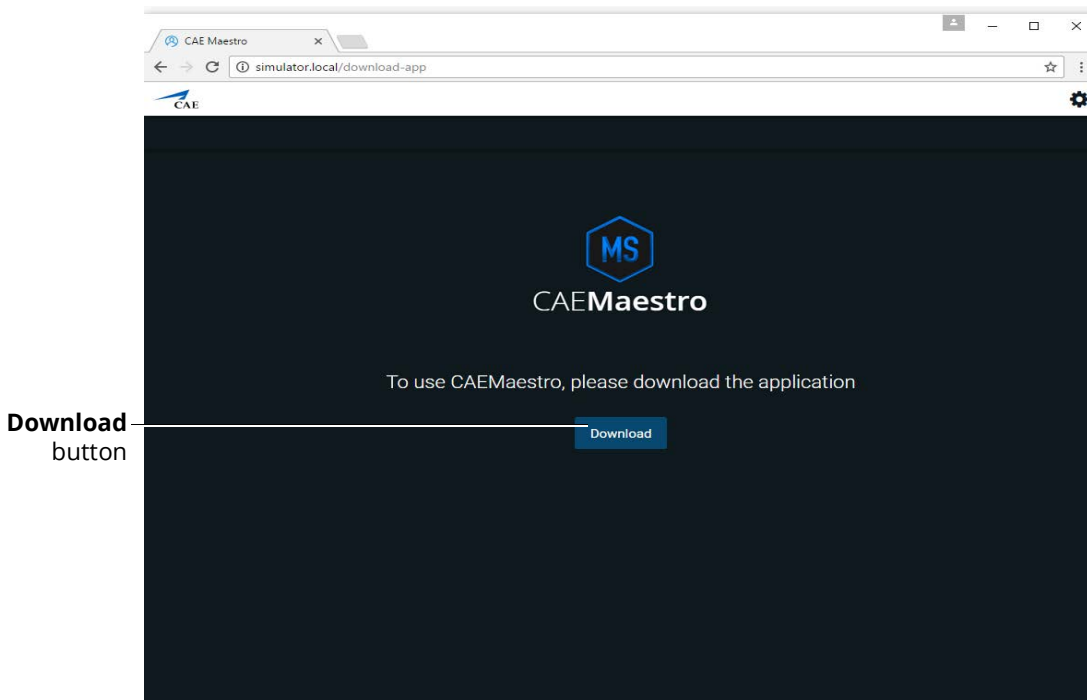
- b. Tap in the address bar and using the keyboard, enter “simulator.local” and press **Enter**.



Google Chrome Browser Window

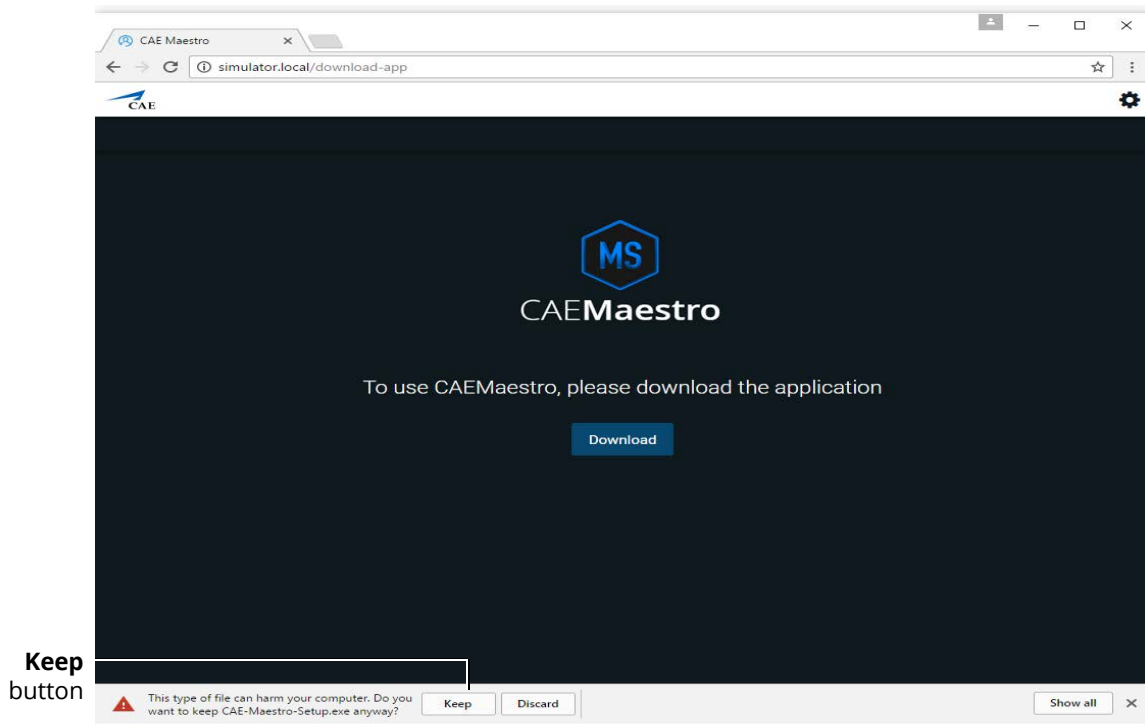
The CAE Maestro Download App page appears.

- c. Tap **Download**.



CAE Maestro Download Page

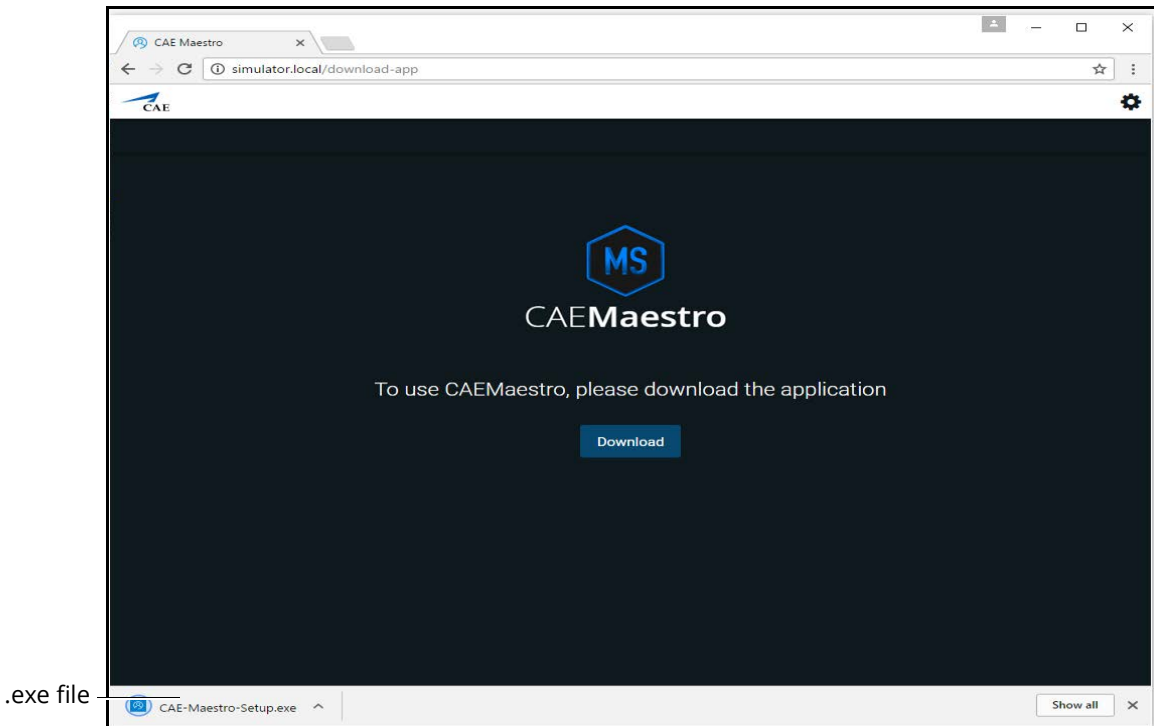
After the download is complete, a banner appears at the bottom of the Chrome window, asking whether to keep or discard the file.



CAE Maestro Download Page

d. Tap **Keep**.

The CAE-Maestro-Setup.exe appears in the Downloads bar at the bottom of the Google Chrome browser window.



CAE Maestro Download Page

- e. Tap the CAE-Maestro-Setup.exe file.

The CAE Maestro Setup application launches and begins installing.

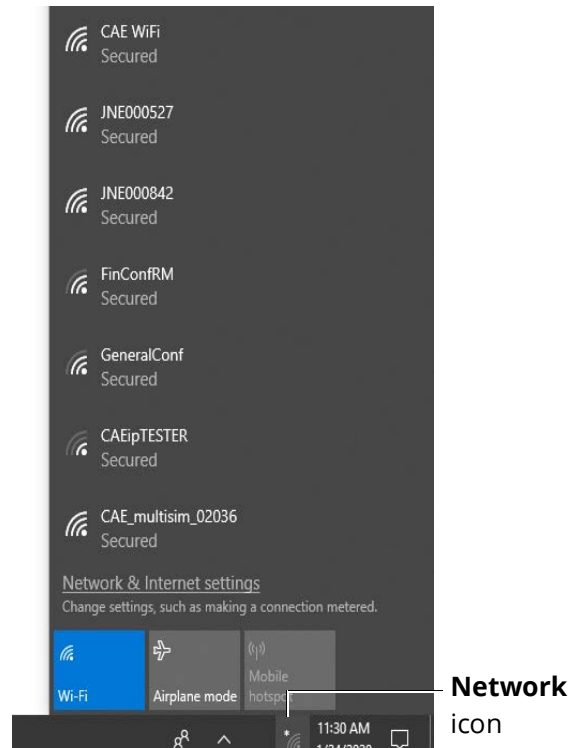
Note: During the CAE Maestro Setup application installation, a window may appear explaining that Windows Defender Firewall has blocked some features of this app. If it appears, tap **Allow** access.

The CAE Maestro screen appears.

Step 3: Connect Patient Monitor to MultiSim Network

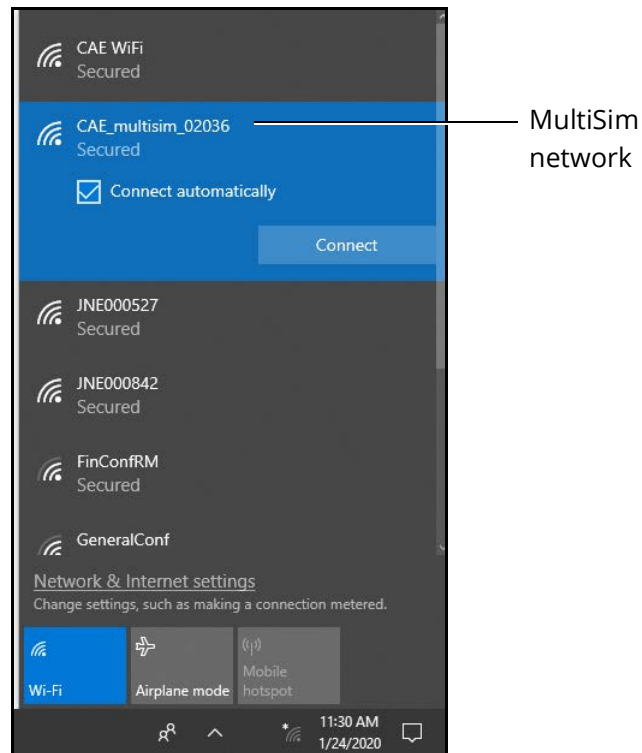
To connect Patient Monitor to the MultiSim network:

- a. Tap the **Network** icon in the Windows taskbar to expand the available networks list.



Patient Monitor Desktop Network Panel

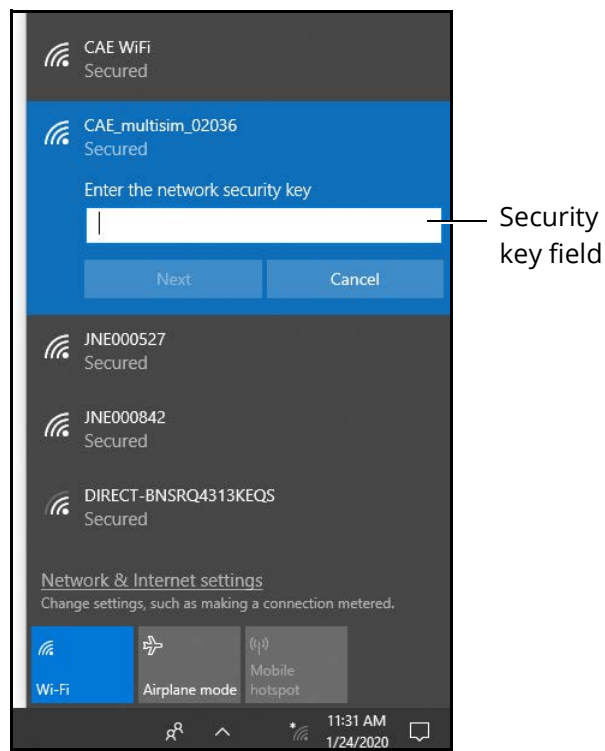
- b. Tap CAE_multisim_XXXXX.



WiFi Connection - MultiSim Network

- c. In the CAE_multisim_XXXXX network option, tap the **Connect Automatically** checkbox and then tap **Connect**.

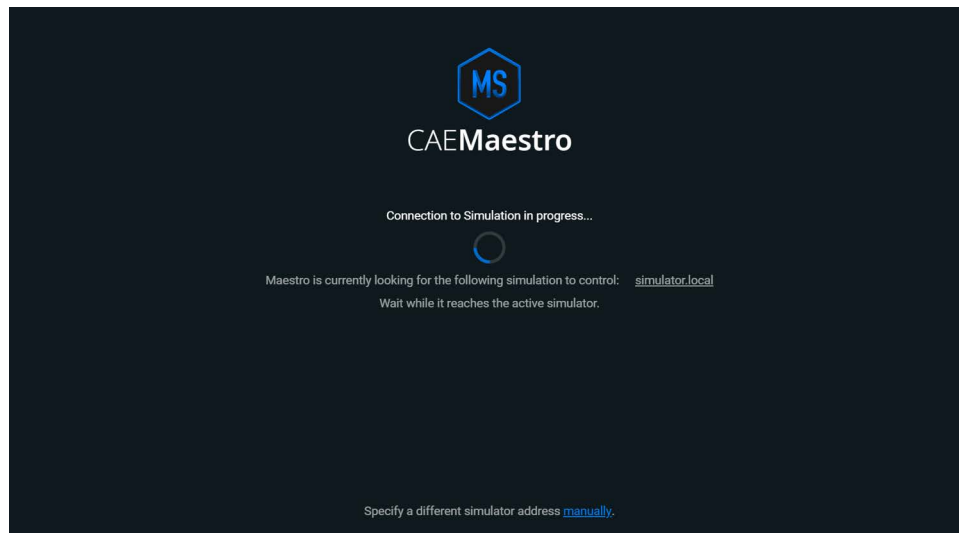
The network security key prompt appears.



WiFi Connection - Network Security Key Prompt

- d. Tap in the Enter the security network key field and type *caeadmin*.
- e. Tap the **Show password** (eye) icon to the right of the field and confirm the password has been entered correctly.
- f. Tap **Next**.
- g. If the discoverable PC prompt appears, tap **Yes**.
- h. Wait a few moments while Patient Monitor connects to the Multisim network.
- i. Close the Google Chrome browser window. The desktop is revealed, showing two new icons (Maestro and Patient Monitor). Tap on the **Patient Monitor** icon.

The CAE Maestro Connecting screen appears.

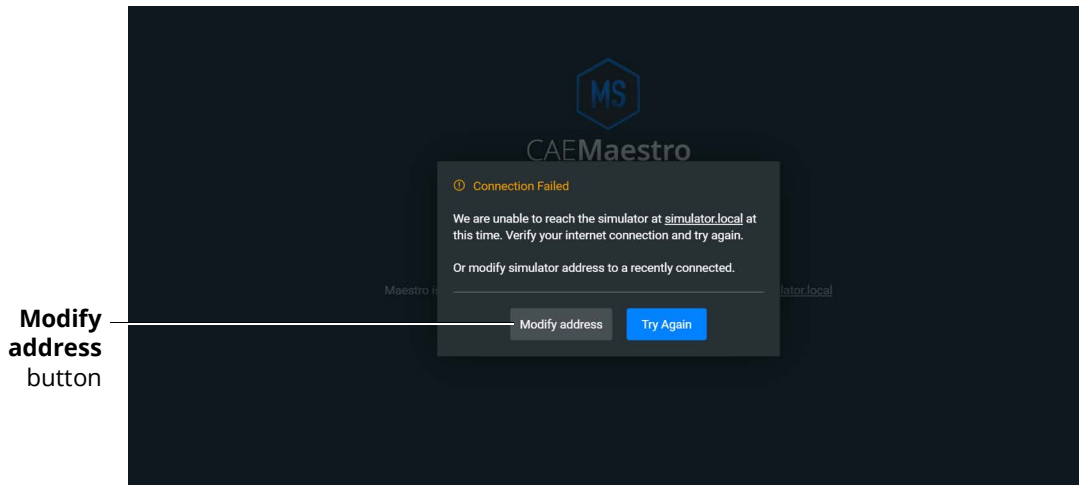


CAE Maestro Connection Screen

- j. Tap on the **manually** link within the first 30 seconds of the application launching.

The Connection failed message appears.

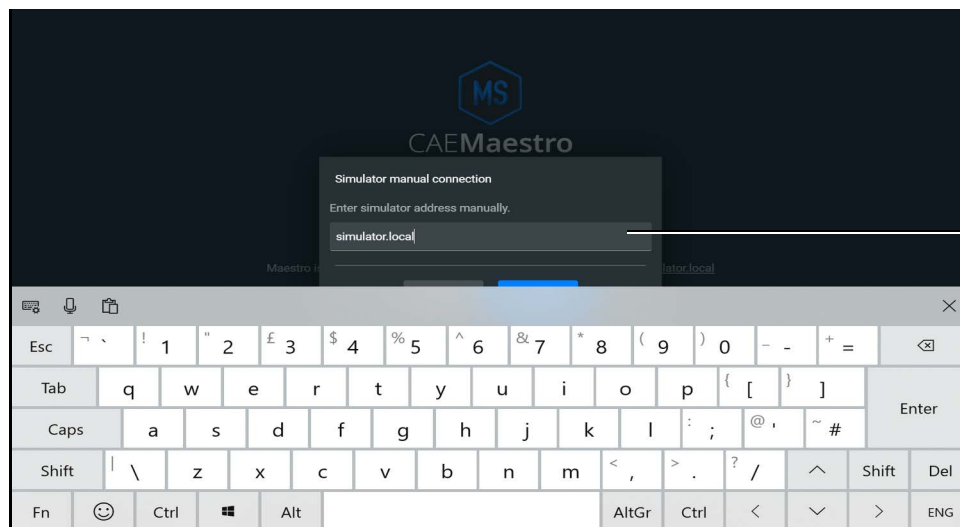
- k. Tap the **Modify address** button.



CAE Maestro Connection Failed Screen

The Simulator manual connection prompt appears.

- l. Using the keyboard, delete *simulator.local* from the text field and enter the serial number found on the back of the designated simulator's tablet (ex. *JNE000826*) or on the removable pad located on the manikin's hip.



Simulator Manual Connection

- m. Tap **Connect**.

The Maestro Home screen appears.

Step 4: Launch the Patient Monitor

To launch the patient monitor from the Maestro Home screen, tap the **Patient Monitor** icon.

Note: The Patient Monitor app can also be launched from its desktop by tapping the Patient Monitor icon.

Troubleshooting

This section describes basic troubleshooting procedures.

Re-establish a Network Connection

When configuring the simulator, if you inadvertently selected or entered the wrong settings, the tablet will not connect to the central router. The following instructions will re-establish the network connection.

You will need:

- A Windows-based laptop where you have Administrator rights
- An Ethernet cable
- Access to a web browser

To re-establish a network connection:

1. Plug the Ethernet cable in the manikin's LAN port, and connect it to the laptop.
2. On the laptop, click the **Network** (Internet Access) icon (located in the lower-right corner of the Windows task bar). Then, click the **Network & Internet settings** link.



Network Access Icon

3. In the Status window, scroll down and then select **View your network properties**.

Status

Show available networks

Change your network settings



Change adapter options

View network adapters and change connection settings.



Sharing options

For the networks you connect to, decide what you want to share.



HomeGroup

Set up a homegroup to share pictures, music, files, and printers with other PCs on your network.



Network troubleshooter

Diagnose and fix network problems.

View your network properties

Windows Firewall

Status Window

4. Scroll to locate the **Default gateway** IP address. (Example: 192.168.x.1, where “x” will vary based on your manikin.) Note this address.

← Settings



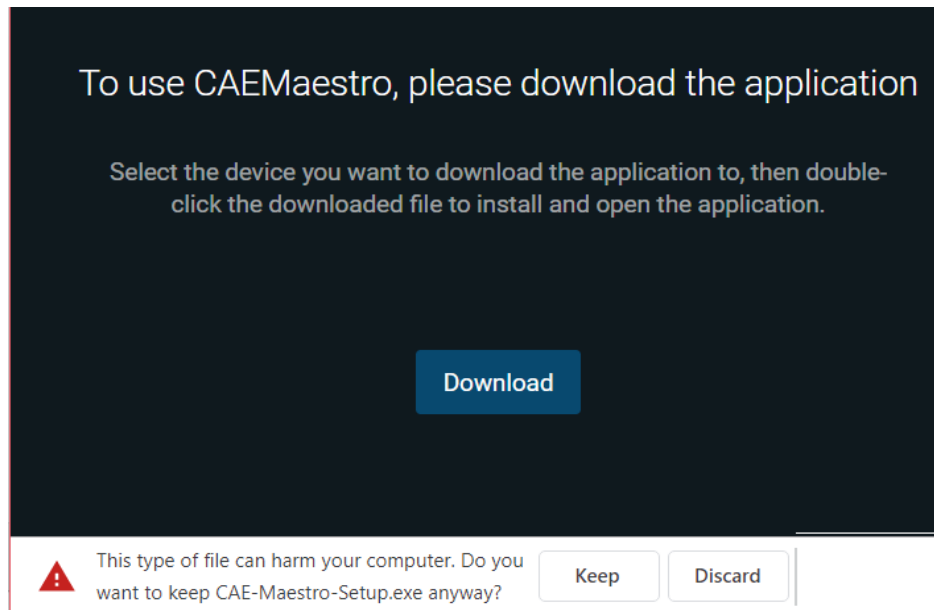
View your network properties

Default gateway: 192.168.xx.1

Network Properties Window

5. Launch a web browser and enter the web address from Step 4, however, change the number “1” to “5”. (Example: 192.168.x.5).

6. On the CAEMaestro download page, click **Download**.



Download Page

7. When a message appears in the lower-left of the screen, click **Keep**.
8. From the Download folder, double-click the **CAE-Maestro-Setup.exe** file.
9. If a SmartScreen opens, click **Run**.

Note: If the Run button does not appear, click **More Info**.

10. Complete the configuration process:
 - a. **On your laptop:** Click the **Maestro** icon on your desktop. Follow the instructions in “*Step 1: Configure Simulators*”.
 - b. **On your tablet:** Refer to “*Step 2: Configure a Tablet*”.

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