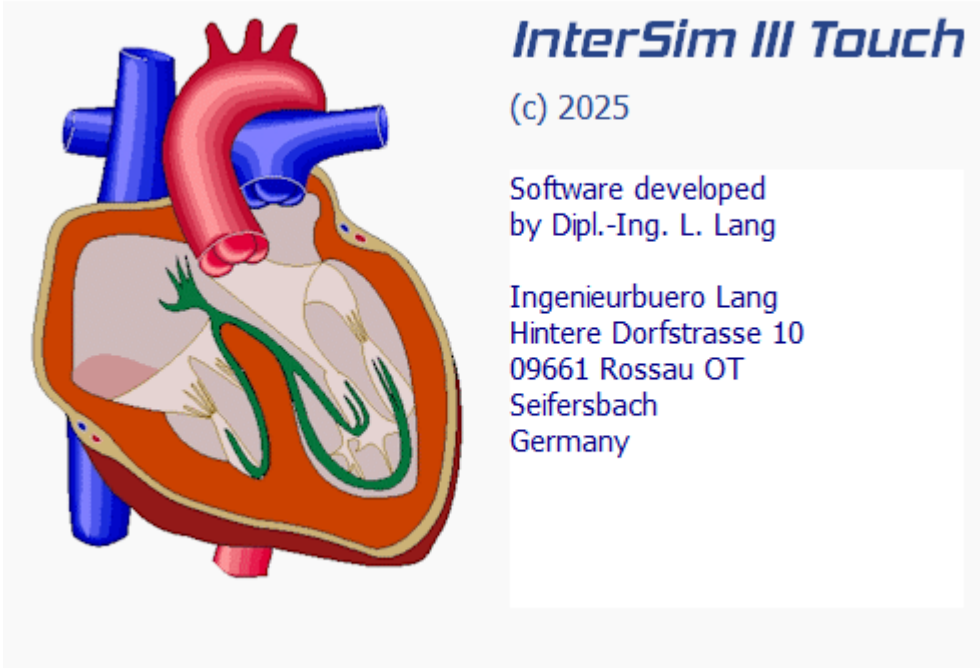
InterSim III Touch

Manual

Contents

About InterSim III



This manual is valid for application version 1.6.9294 and later.

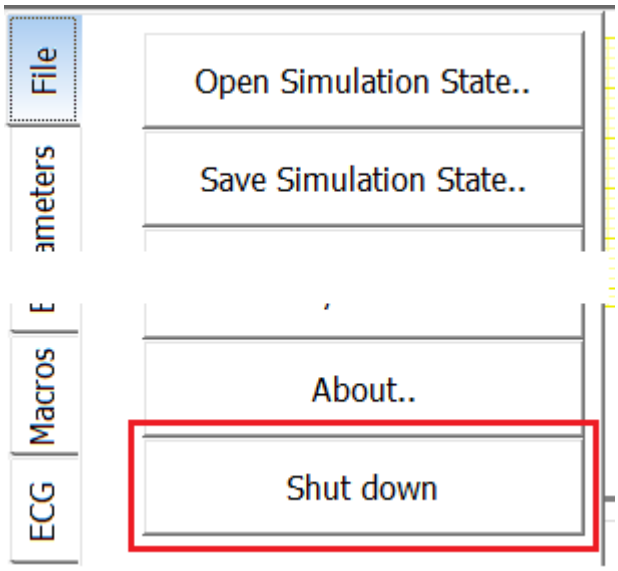
InterSim Operation

Power on/off

Press the power button to turn on the tablet.

The simulator screen should appear after a few seconds. If the boot process stops at the Windows login screen, press the InterSim icon to start the simulator.

Press the "Shut Down" button in the File menu to power off the simulator.



It is also possible to shut down the simulator by pressing the power button.

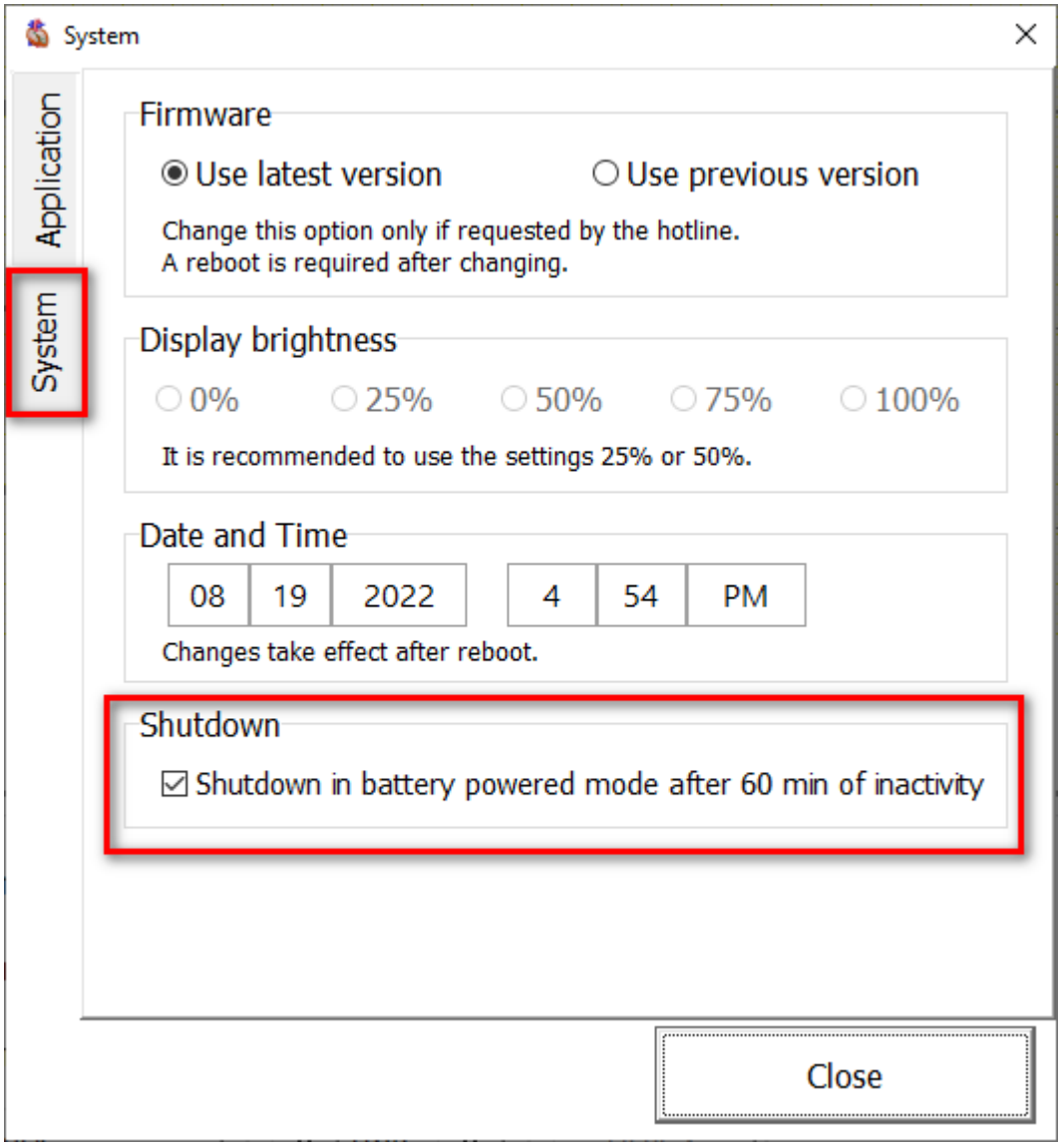
Power saving

The following power saving options are available.

	On battery	Plugged in
Turn off the display	15 minutes*	60 minutes*
Shutdown the simulator	60 minutes*	never

*of inactivity

The option "Shutdown" is located in the System dialog (File menu, System menu item).



Turn the display on when it is off:

InterSim III Touch, series 1: use the Windows Logo Button

InterSim III Touch, series 2: press the power button briefly.

Home Screen

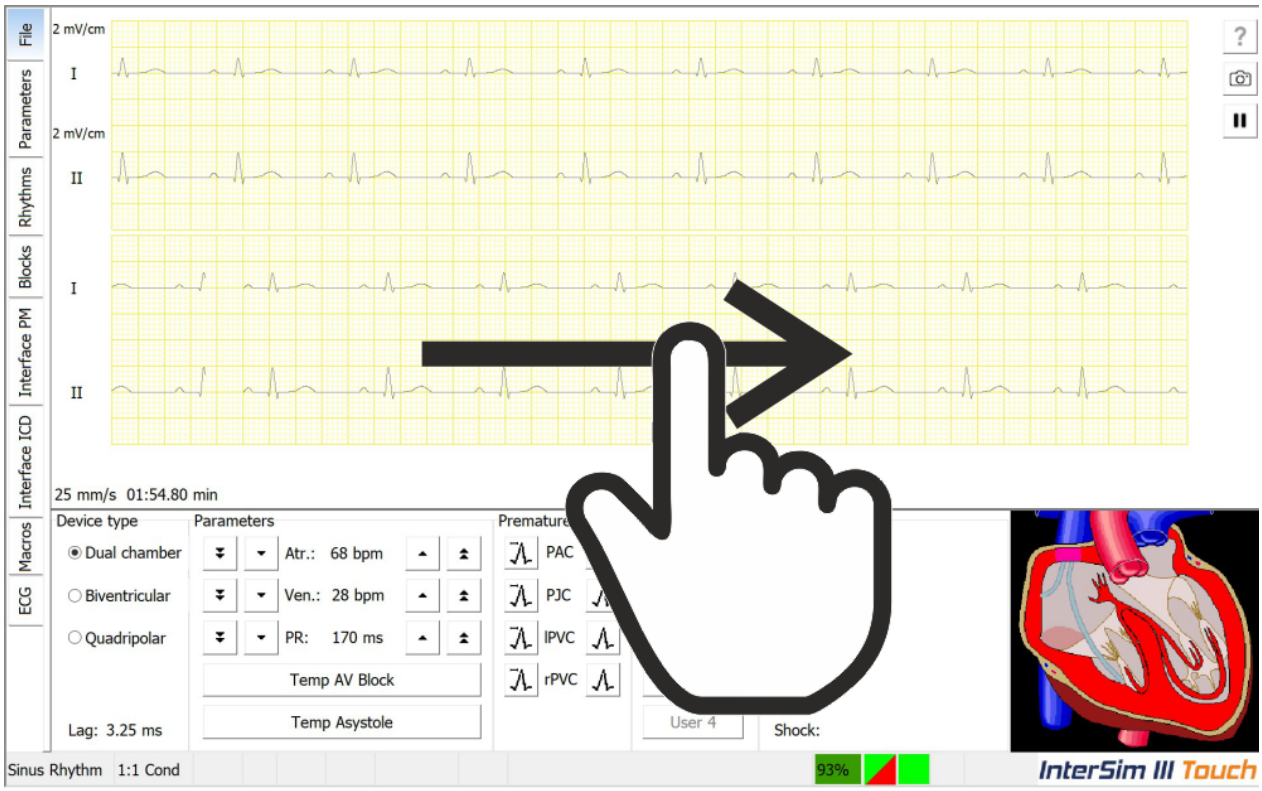
The most important controls and displays are grouped together on the home screen:

- See the wavefront propagation, pacing and sensing in the heart window.
- Choose the appropriate device type in the device group box.
- Select the most important parameters in the parameters group box.
- Trigger premature contractions using the buttons in the premature group box.
- See the most important parameters in the state group box at a glance.
- Get a better overview through the ECG.

Operation

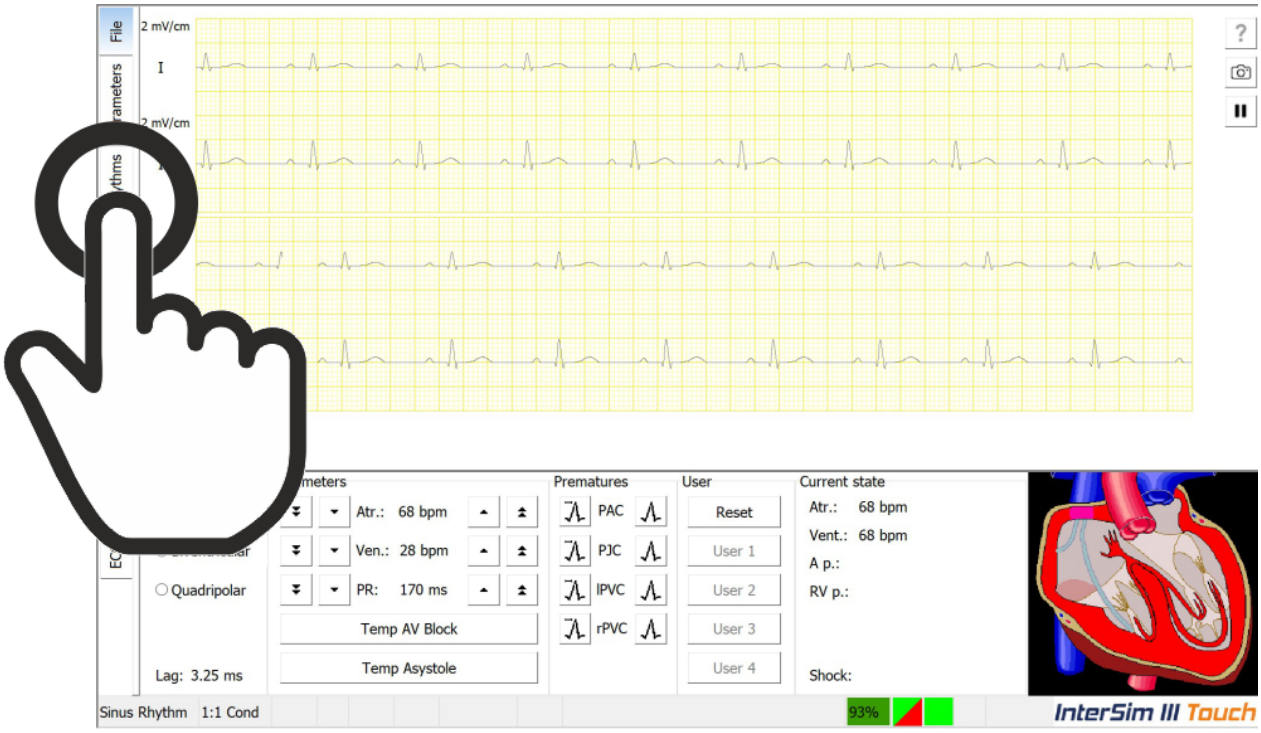
Open Menu

Wipe to the right.



Open Specific Menu

Touch the menu item.

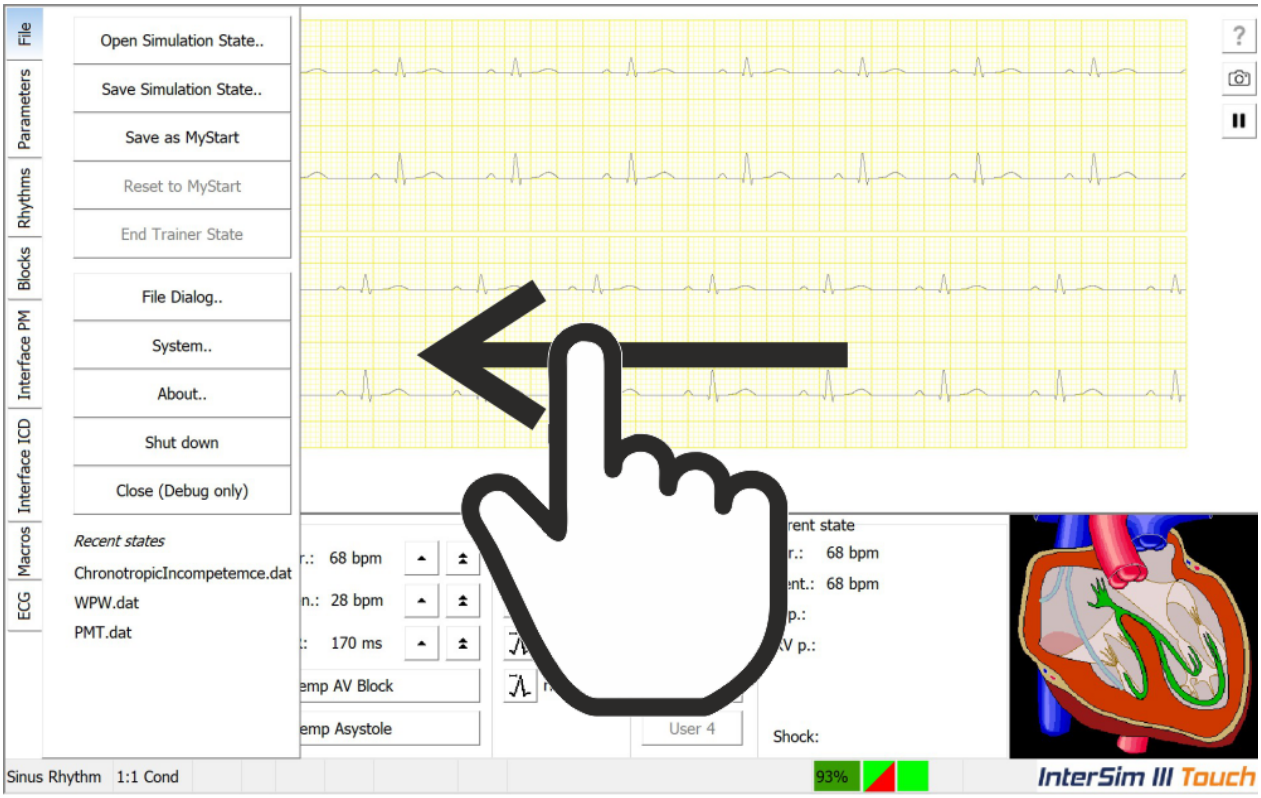


Open File Menu

Wipe first up and then right.

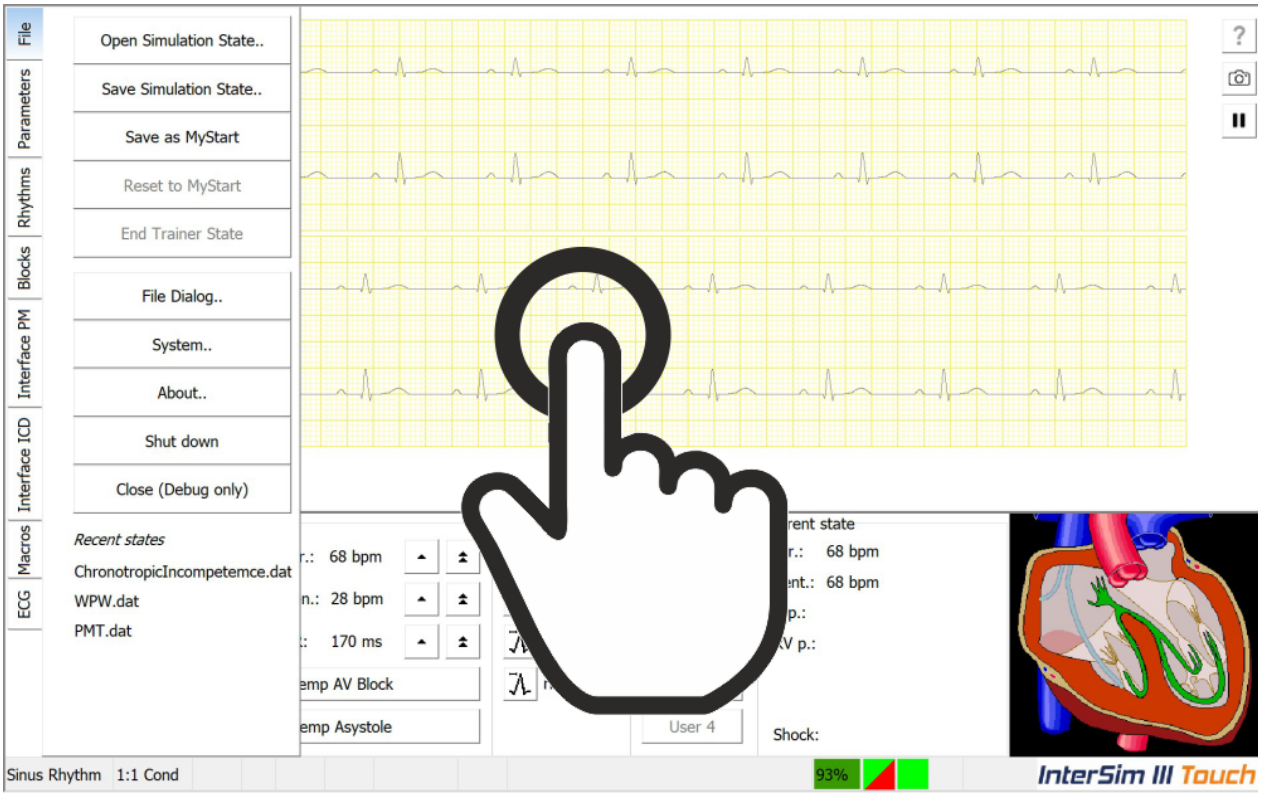
Close Menu (1)

Wipe to the left.



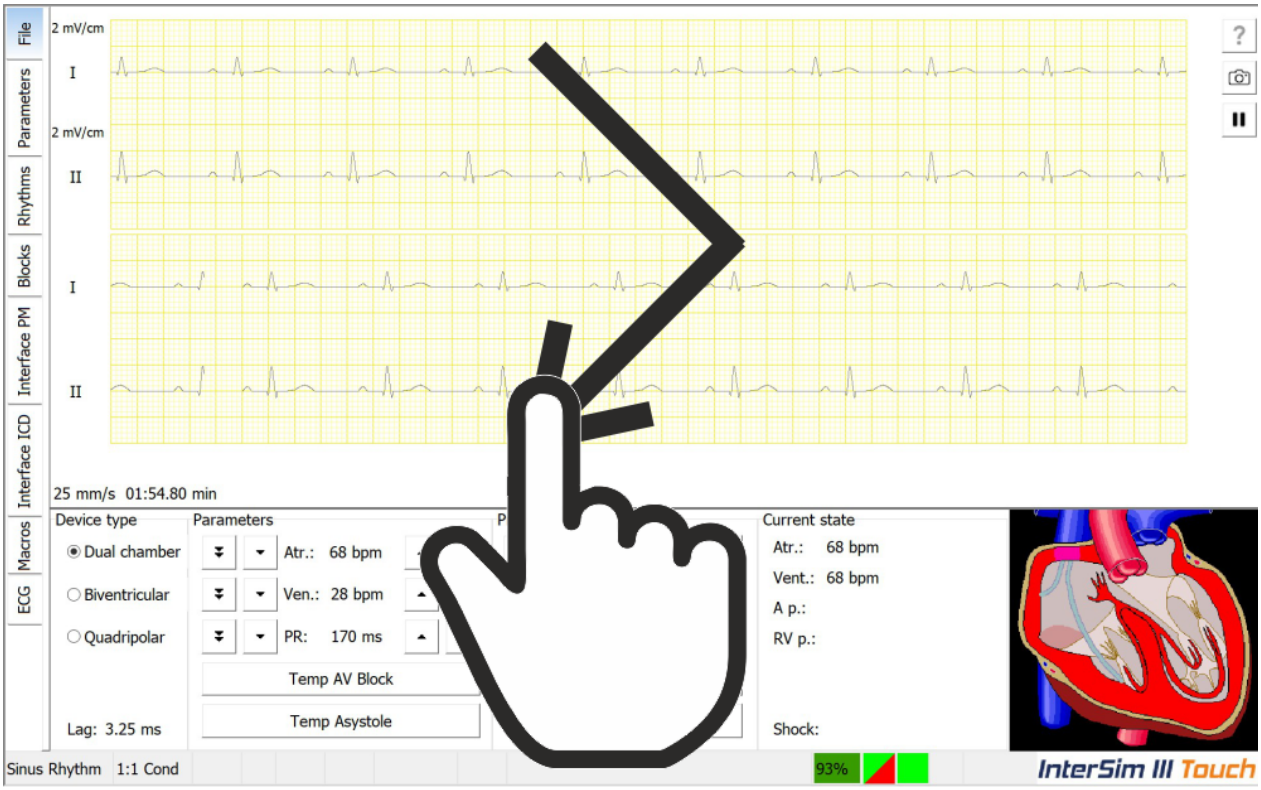
Close Menu (2)

Touch the screen outside the menu.



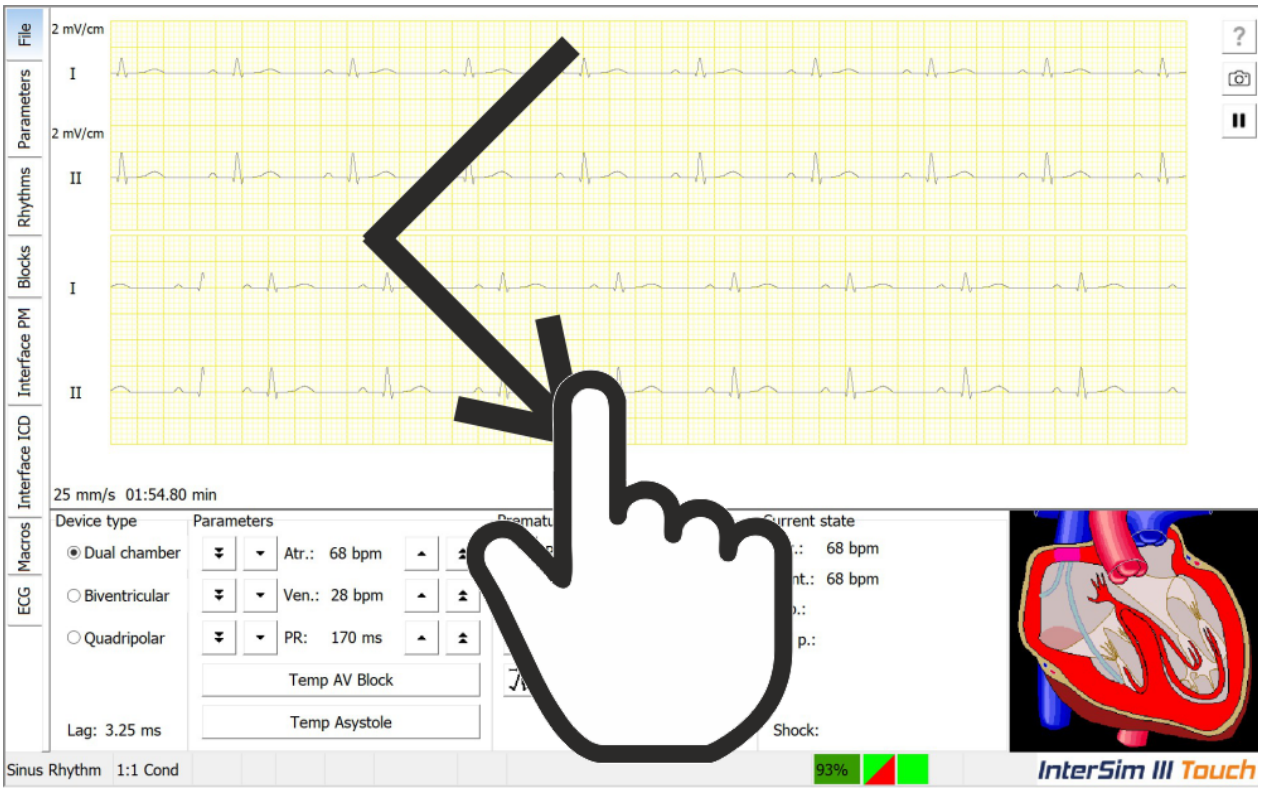
Increase Sweep Speed

Wipe first to the bottom right and then to the bottom left.



Decrease Sweep Speed

Wipe first to the bottom left and then to the bottom right.



Zoom In

Wipe first to the top right and then to the bottom right.

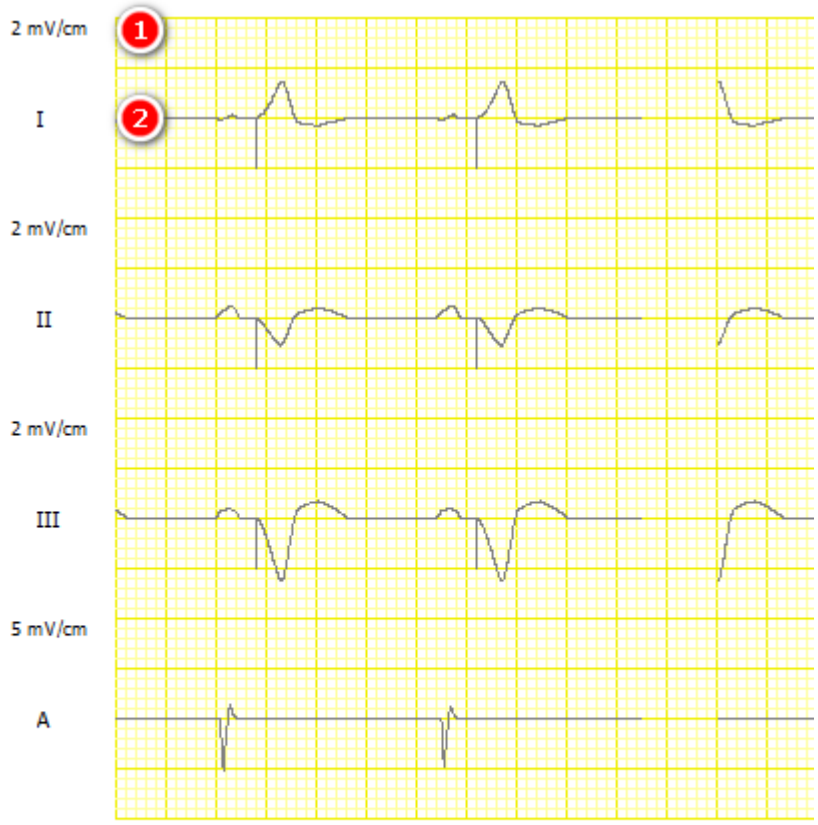
Zoom Out

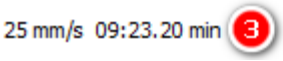
Wipe first to the bottom right and then to the top right.

ECG

Watch the simulated ECGs or EGMs in the ECG display.

ECG Display



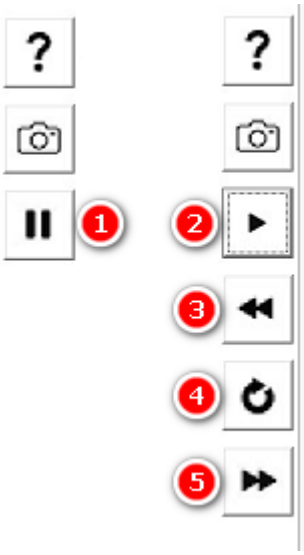


1 **Amplification**
Shows the amplification of the assigned ECG trace. Adjust all amplifications with the menu item Normalize.

2 **Lead**
Shows the lead of the assigned ECG trace. Select a maximum of four traces from the Traces submenu.

3 **Sweep Speed and Time**
The first number shows the current Sweep Speed. The second value is the simulation time of the upper left corner of the ECG display.

ECG Review



Pause button
Press the Pause button to go up to 8 minutes back in the ECG. The button will become the Run button and the Backward button, Refresh button, and Forward button will be shown.

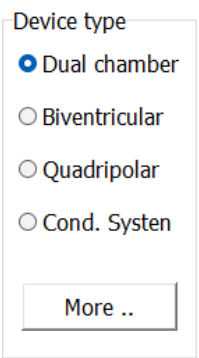
Run button
Press the Run button to see the real time ECG again. Upon continuation the ECG buffer will be cleared.

Backward button
Press the Backward button to move the ECG half a page backward. Use the time display in the lower left corner to track the location in the ECG buffer.

Refresh button
Press the Refresh button if you have changed the visible traces, the sweep speed, or the zoom factor.

Forward button
Press the Forward button to move the ECG half a page forward. Use the time display in the lower left corner to track the location in the ECG buffer.

Device type

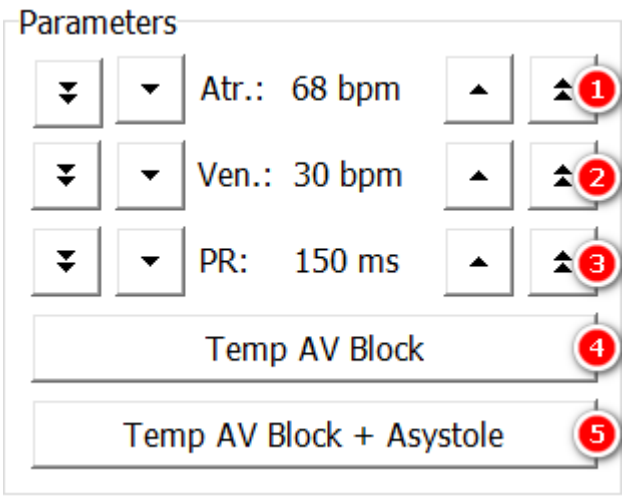


Choose the appropriate device type that matches your device. If the device type is not displayed, press the More button. Some settings are shown or hidden depending on this type:

- display of LV pace values
- LV ECG trace
- Left Ventricle Setup
- ma Threholds for temporary pacemaker

If an adapter box is connected, additional restrictions may apply.
The SICD device type is visible after a SICD HV adapter has been connected for the first time.

Parameters



Atrial Rate
Use the buttons to manually control the intrinsic sinus node rate.
See also Parameters/Rates.

Ventricular Rate
Use the buttons to manually control the intrinsic ventricular escape rate.
See also Parameters/Rates.

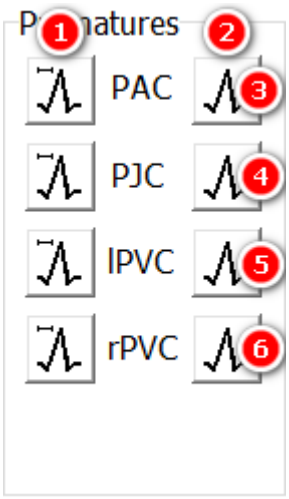
PR interval
Use the buttons to manually control the interval between the intra-atrial P wave and the intraventricular R wave in case of 1:1 conduction.
See also Parameters/Intervals.

Temp AV Block
While depressed, this button allows temporary application of 3rd degree AV block.
See also Blocks.

Temp AV Block + Asystole
While depressed, this button allows temporary application of 3rd degree AV block and asystole.
See also Blocks.

Premature Contractions

Use these buttons to create premature contractions.



Premature Contractions with Coupling Interval
The buttons in the left column create premature contractions after an intrinsic action. The delay is set by the Coupling Interval.
Hold a button to create a series of premature contractions.

Immediate Premature Contractions
The buttons in the right column create premature contractions immediately. If the tissue is just refractory no premature contraction will be created.
Hold a button to create a series of premature contractions.

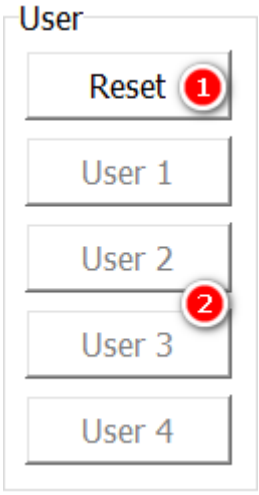
PAC
These two buttons create premature atrial contractions.

PJC
These two buttons create premature junctional contractions.

lPVC
These two buttons create premature left ventricular contractions. The lPVC amplitude of the surface ECGs and HV lead EGMs can be changed by the PVC Amplitudes.

rPVC
These two buttons create premature right ventricular contractions. The rPVC amplitude of the surface ECGs and HV lead EGMs can be changed by the PVC Amplitudes.

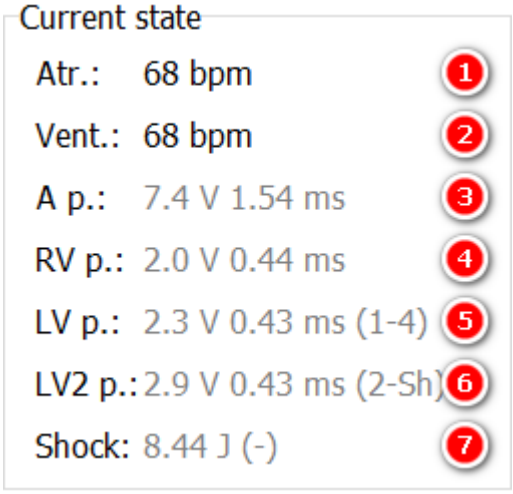
User



Reset
Resets all parameters to default values. See also values after Reset.

User Buttons
Use the User Buttons for quick access to frequently used States or Macros. Create these States via Save Simulation State or the Macros via Save Macro. Apply the States or Macros via Assign User Buttons.

Current State



Current Atrial Rate
This value shows the current intrinsic or paced atrial rate.

Current Ventricular Rate
This value shows the current intrinsic or paced ventricular rate.

The pace displays show the measured voltage and pulse width. The color of the display changes to black for about 0.5 seconds for a currently delivered pulse.
The active electrodes are placed in the parenthesis (1-4, R, Sh). For unipolar left ventricular pacing, only the cathode will be displayed.

- u: unipolar

- b: bipolar
- 1: LV Tip 1
- 2: LV Ring 2
- 3: LV Ring 3
- 4: LV Ring 4
- Sh: Shock Coil
- R: RV Ring

Most Recent Atrial Pace Values
This entry shows voltage and duration of the most recent atrial pace.

Most Recent Right Ventricular Pace Values
This entry shows voltage and duration of the most recent right ventricular pace.

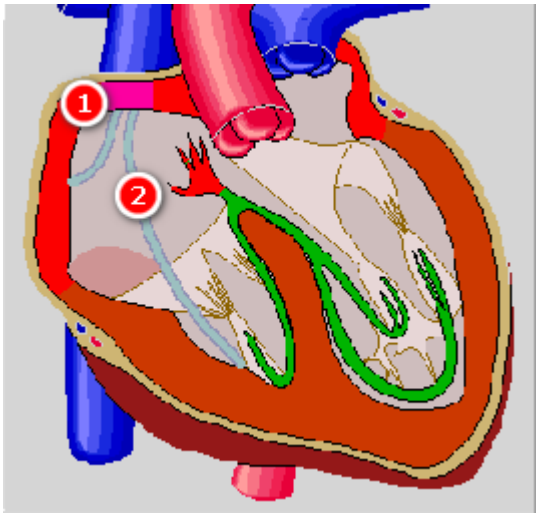
Most Recent Left Ventricular Pace Values
This entry shows voltage and duration of the most recent left ventricular pace. It is only visible for biventricular and quadripolar devices.
The active poles are placed in the brackets (1 - 4, R, Sh). For unipolar pacing, only the cathode will be displayed.

Most Recent Second Left Ventricular Pace Values (MPP)
This entry shows voltage and duration of the second left pace for MPP devices. It is only visible for quadripolar devices and shows the second pace in case of multipoint pacing. The active poles are placed in the brackets (1 - 4, R, Sh). For unipolar pacing, only the cathode will be displayed.

Most Recent Shock Values
This entry shows energy and polarity at RV coil of the most recent shock event.

Animated Heart

The heart window illustrates the wavefront propagation, pacing and sensing as shown in the figure below. The image changes with the selected device type. It is hidden when the Macro Execution Window is shown.



Myocardium
Brown: repolarized
Red: depolarized
Magenta: automaticity or paced
Blue: hit in vulnerable phase

Lead
Gray: inactive
Yellow: sensing
Magenta: pacing

Status Bar

Rhythm
The currently active rhythm.
If Dual Tachycardia is activated, abbreviations of both rhythms are displayed.

AV block
The currently AV conduction status.

Retrograde Conduction
"Retro" if Retrograde Conduction is selected.

Accessory Pathway
"Acc" if Accessory Pathway is selected.

LBBB
"LBBB" if Left Bundle Branch Block is selected.

RBBB
"RBBB" if Right Bundle Branch Block is selected.

"LBBB" and "RBBB" cannot be checked at the same time.

Exercise
"W#/#" if Auto Sinus & PR is active.
The first number shows the current workload, the second number the exercise level of the patient as a percentage.
For Example: "W50/43" stands for a current workload of 50% and a current exercise level of 43%.

Macro active
The word "Macro" flashes if a macro is currently running.

Macro message area
This area shows the filename of the currently loaded macro or the macro message output last.

Battery Status
This field shows the current battery state as percentage. If the simulator is charging the battery state flashes alternately with the abbreviation "Chrg".

Hardware Status
The simulator electronics is compromised.

The connection to the simulator electronics has been successfully established.

The lower half turns green in case an Adapter Box is connected and recognized. It remains red in case no Adapter Box is connected or the communication between simulator electronics and Adapter Box is compromised.

12 Delay Indicator

Normal operation, real time simulation available.

Borderline condition exists for a short period in time.

Real-time simulation not possible.

13 Classroom State

Classroom functionality enabled. InterSim III is used in classroom mode.

Connection to local or web classroom server established.

Classroom Session active.

Error occurred.

Please note that not all fields will appear at the same time. The picture is a composite.

Exercise

If the Auto Box ☐ Auto Sinus & Auto PR Interval is checked in the Exercise menu, the simulator controls sinus rate, PR interval, and QT time relative to the selected workload.
If the box is checked, a colored trackbar will appear at the right edge of the screen:

1 Colored Trackbar

The Trackbar represents the range of possible workloads from 0% (green) to 100% (red).

2 Slider

The slider shows the current workload. To quickly change the workload, touch the slider and move it to a position related to the desired value.

Take Screenshot

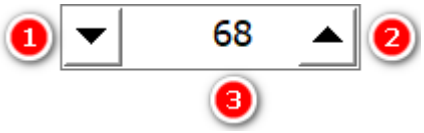
Camera Button
Press the Camera Button to take a screenshot of the current ECG.
After capturing the ECG, a Filename Dialog will appear.

Note that only the ECG is captured; Parameters and other Home Screen settings are not included in the snapshot.

Menu

Number Fields

Some parameters will be set by using of Number Fields.



Decrement Arrow
Use the Decrement Arrow to decrement the value. Some Number Fields will use predefined steps.

Increment Arrow
Use the Increment Arrow to increment the value. Some Number Fields will use predefined steps.

Edit Area
Tap in the field to bring up a keypad that simplifies data entry.

File

The File menu contains all commands necessary for dealing with Simulation States and some additional system commands.

Open Simulation State

This menu item opens the Open State Dialog.

Save Simulation State

This menu item opens the Save State Dialog.

Assign User Buttons

This menu item opens the Assign User Buttons Dialog.

Save as MyStart

Touching this menu item creates the special MyStart State.

Reset to MyStart

The MyStart State is a special state that is automatically loaded at program startup. Use this menu entry to return at any time to this state.

End Trainer State

A Trainer State allows access to a limited set of parameters. Use this menu item to return to normal operation.

Trainee Connect Dialog

This menu item is available when the Enable Classroom Checkbox in the System Dialog is selected. It opens the Local Trainee Connect Dialog or the Web Trainee Connect Dialog.

Trainer Session Dialog

This menu item is available when the Enable Classroom Checkbox in the System Dialog is selected. It opens the Local Trainer Session Dialog or the Web Trainer Session Dialog.

Wifi Dialog

This menu item is available when the Enable Classroom Checkbox in the System Dialog is selected. It is only enabled when an external WIFI antenna, which can be purchased as an accessory, is connected. The menu item opens the WIFI Dialog.

File Dialog

The menu item File Dialog opens the File Dialog Window.

System

The menu item System opens the System Settings Window.

About

The menu item About opens the About Window.

Shut Down

Use this menu item to shut down the simulator. If the macro window contains a changed and unsaved macro, a confirmation dialog will appear before shutting down.

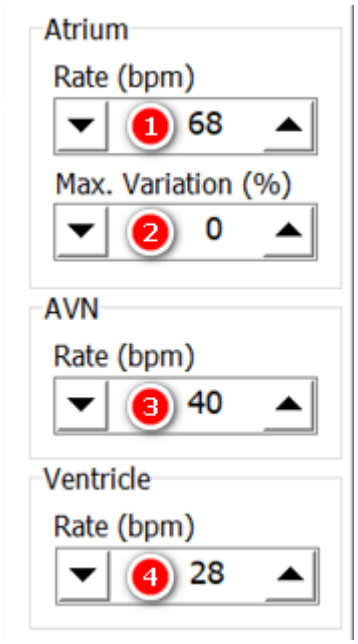
List of Recent States

This list holds recently saved or loaded states. Touch the filename of the state you want to load again.

Parameters

The Parameters menu contains settings that primarily control rates and timing.

Rates



Atrial Rate
Use this to set the intrinsic sinus node rate. Note that this value will only take effect if the checkbox Auto Sinus & Auto PR Interval is not selected. Otherwise the simulator will control the atrial rate. The range is from 2 bpm to 245 bpm.

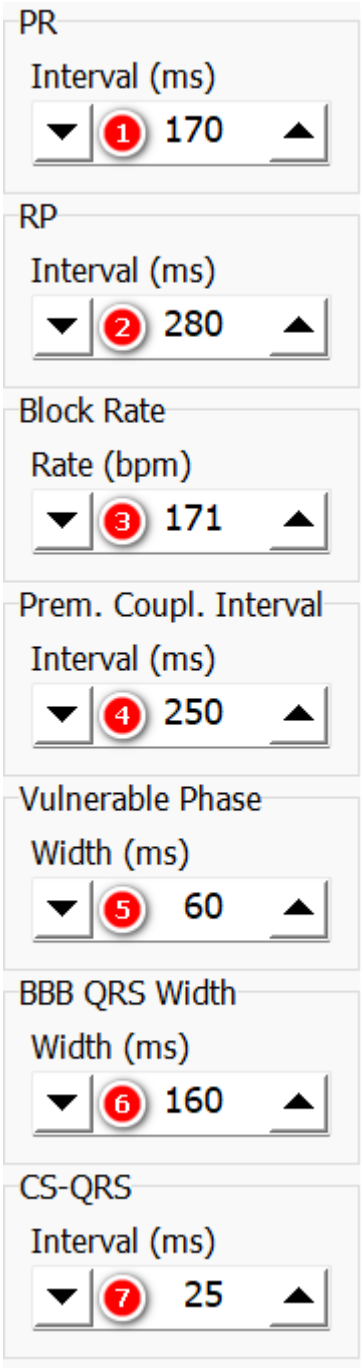
Max. Variation
Use this to define the maximum variation of the sinus node rate. The range is from 0% to 20%.

AVN Rate
Use this to set the intrinsic AV nodal escape rate. The range is from 2 bpm to 200 bpm.

Ventricular Rate
Use this to set the intrinsic ventricular escape rate. The range is from 2 bpm to 250 bpm.

See also Number Fields.

Intervals



PR Interval
Use this to set the interval between the intra-atrial P wave and the intraventricular R wave in case of 1:1 conduction. Note that this value will only be effective if the checkbox Auto Sinus & Auto PR Interval is not selected. Otherwise the simulator will control the PR Interval. The range is from 50 ms to 400 ms.

RP Interval
If retrograde conduction is enabled, use this to set the RP interval. The range is from 130 ms to 600 ms.

AVN Block Rate
Use this to set the block rate of the atrioventricular conduction (Wenckebach point). The range is from 20 bpm to

250 bpm.

4 **Premature Coupling Interval**
Use this to set the coupling interval of prematures. This value will be effective on prematures which are triggered by means of the left column of the premature buttons. The range is from 100 ms to 1000 ms.

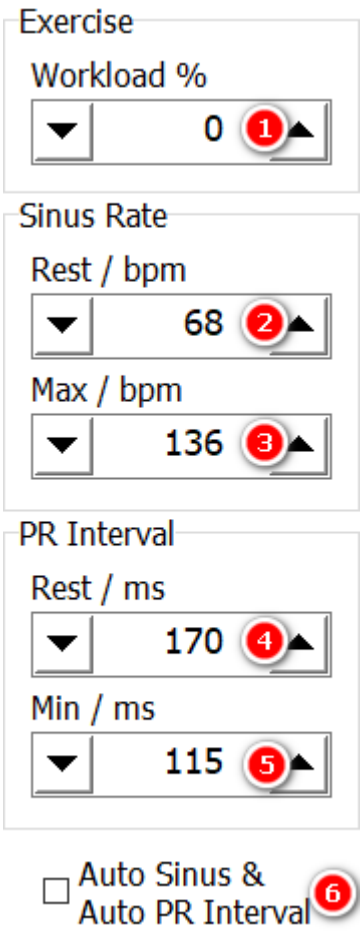
5 **Vulnerable Phase Width**
This parameter applies to the initiation and termination of tachyarrhythmias. It determines the width of the vulnerable phase at the end of the refractory period of the atria and the ventricles. The range is from 40 ms to 80 ms.

6 **BBB QRS Width**
If LBBB or RBBB is active, use this to set the QRS width. The range is from 80 ms to 220 ms.

7 **CD-QRS**
Use this to set the interval between the conduction system signal and the QRS complex. The range is fro 16 ms to 35 ms.

See also Number Fields.

Exercises



1 **Current Workload in %**
If the Auto Checkbox is checked, the patient's exercise level increases or decreases to meet the value of the workload. The exercise level in turn determines Sinus Rate and PR Interval. The range is from 0 to 100%.

 **Sinus Rest Rate**
The Sinus Rest Rate is the rate at an exercise level of 0%. The range is from 0 to 245 bpm.

 **Max Sinus Rate**
The Max Sinus Rest Rate is the rate at an exercise level of 100%. The range is from 0 to 245 bpm.

The Sinus Rest Rate cannot be set to a higher value than the Max Sinus Rate.

 **PR Rest Interval**
The PR Rest Interval is the interval at an exercise level of 0%. The range is from 50 to 400 ms.

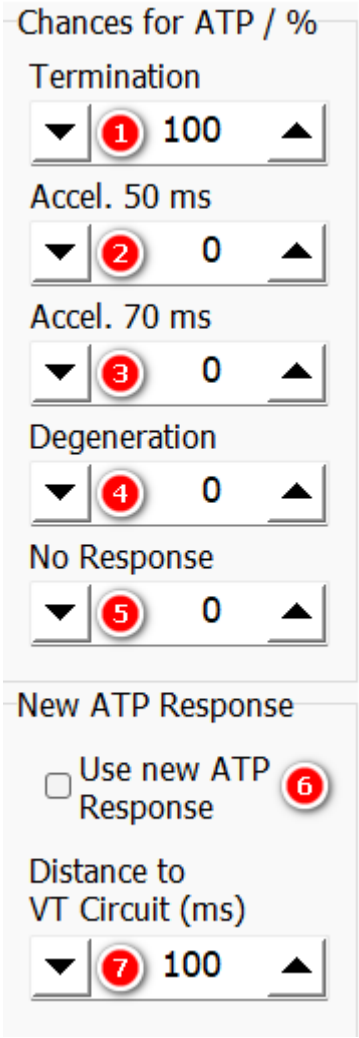
 **Min PR Interval**
The Min PR Interval is the interval at an exercise level of 100%. The range is from 50 to 400 ms.

The PR Rest Interval cannot be set to a lower value than the Min PR Interval.

 **Auto Sinus & Auto PR Interval**
If the Auto Checkbox is checked, Sinus Rate and PR Interval are set automatically by the simulator. If the box is unchecked, the values are determined by the appropriate controls.

See also Number Fields.

ATP



Chances for ATP determine the result of an ATP while a sinus tachycardia <180 bpm or a ventricular tachycardia <182 bpm is active. Note that the sum of the chances must be 100%. Follow a top-down direction while entering new values.

1 **Termination**
Sets the chance of termination of a tachycardia.

2 **Acceleration 50 ms**
Sets the chance of acceleration of a tachycardia by 50 ms.

3 **Acceleration 70 ms**
Sets the chance of acceleration of a tachycardia by 70 ms.

4 **Degeneration**
Sets the chance a tachycardia will degenerate to a fibrillation.

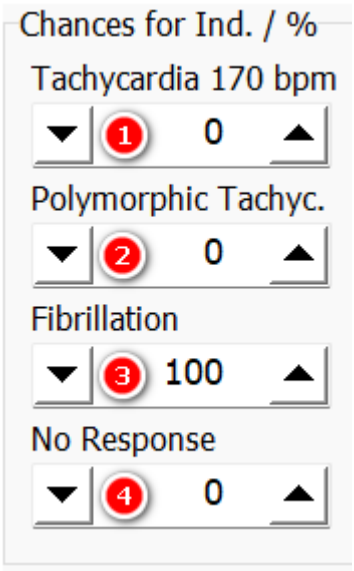
5 **No Response**
Sets the chance that the virtual patient does not response to an ATP.

Use new ATP Responde
Select this checkbox to use a new variant to end an ATP.

Distance to RVT Circuit (ms)
This is the distance to the right ventricular tachycardia circuit in ms. You need the corresponding number of S1 pulses to bridge this distance. The subsequent S2 pulse must be coupled with 76% to 80% of the tachy interval to end the tachycardia.
Add 35 ms if you use a left ventricular tachycardia.

See Antitachycardia pacing, Cardioversion and Defibrillation and Number Fields.

Induction



Chances for Induction determine the result of an induction like T wave shock, QRS shock, or alternating current while a sinus rhythm is active. Note that the sum of the chances must be 100%. Follow a top-down direction while entering new values.

Monomorphic Tachycardia 170 bpm
Sets the chance of induction of a Monomorphic Tachycardia.

Polymorphic Tachycardia
Sets the chance of induction of a Polymorphic Tachycardia.

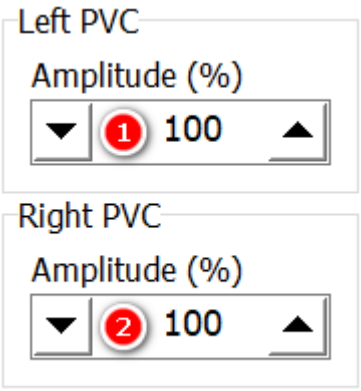
Fibrillation
Sets the chance of induction of a Ventricular Fibrillation.

No Response
Sets the chance that the virtual patient does not response to an Induction.

See Antitachycardia pacing, Cardioversion and Defibrillation and Number Fields.

PVC Amplitudes

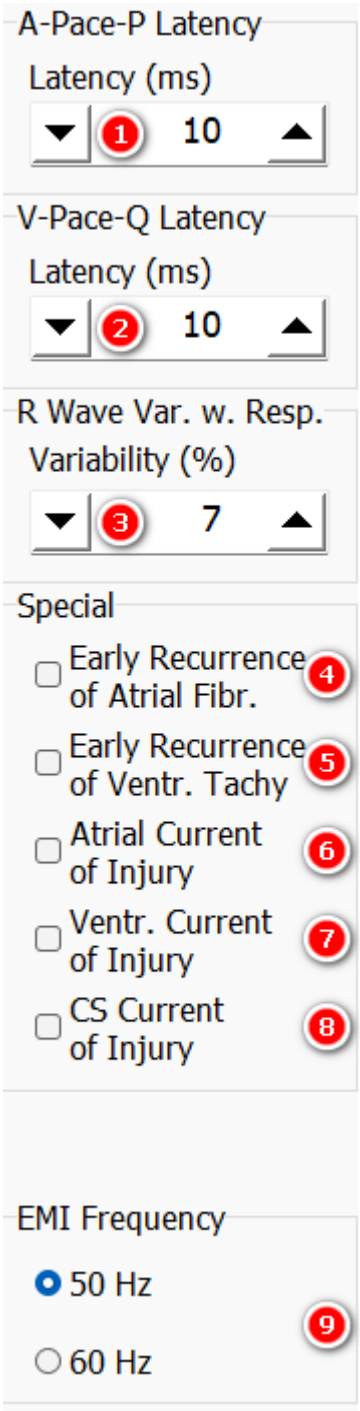
The settings of the PVC Amplitudes control the amplitudes of left and right ventricular premature contractions. This way, it is possible to show an undersensing of a R wave following a PVC.



Left PVC Amplitude
Use this to set the left PVC amplitude of the surface ECGs and HV lead EGMs as percentage of the R wave amplitude. The range is from 50% to 300%.

Right PVC Amplitude
Use this to set the right PVC amplitude of the surface ECGs and HV lead EGMs as percentage of the R wave amplitude. The range is from 50% to 300%.

Miscellaneous



1 **A-Pace-P Latency**
Use this to set the latency between the delivery of the atrial stimulus and the resultant atrial excitation. The range is from 1 ms to 150 ms.

2 **V-Pace-Q Latency**
Use this to set the latency between the delivery of the ventricular stimulus and the resultant ventricular excitation. The range is from 1 ms to 150 ms.

3 **R Wave Variability**
Use this to set the variability of the R wave amplitude with the respirational cycle. The range is from 0% to 40%.

4 **Early Recurrence of Atrial Fibrillation**

By means of this box the ERAF phenomenon (Early Recurrence of AF) can be shown.
Procedure:

- select ERAF
- choose atrial fibrillation
- terminate the atrial fibrillation, for example manually
- without pacing the atrial fibrillation will recur after a while
- with pacing (> 80 bpm) the atrial fibrillation will not recur

5 Early Recurrence of Ventricular Tachycardia
By means of this menu item the ERVT phenomenon (Early Recurrence of VT) can be shown.
Procedure:

- select ERVT
- choose ventricular fibrillation
- terminate the ventricular fibrillation, for example manually
- without pacemaker interaction the ventricular fibrillation will recur after a while
- with pacemaker interaction (> 80 bpm) the ventricular fibrillation will not recur

6 Atrial Current of Injury
Select this checkbox to demonstrate an atrial current of injury. The Current of Injury decreases over time and switches off automatically after 5 minutes.

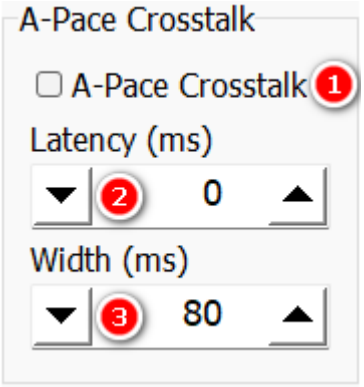
7 Ventricular Current of Injury
Select this checkbox to demonstrate a right ventricular current of injury. The Current of Injury decreases over time and switches off automatically after 5 minutes.

8 Conduction System Current of Injury
Select this checkbox to demonstrate a conduction system current of injury. The Current of Injury decreases over time and switches off automatically after 5 minutes.

9 EMI Frequency
Use 50 or 60 Hz as mains frequency. This frequency affects the 50 Hz or 60 Hz EMI settings, respectively.

Oversensing

A-Pace Crosstalk



1 A-Pace Crosstalk
This parameter is intended to demonstrate ventricular safety pacing that occurs if the pacemaker discovers any

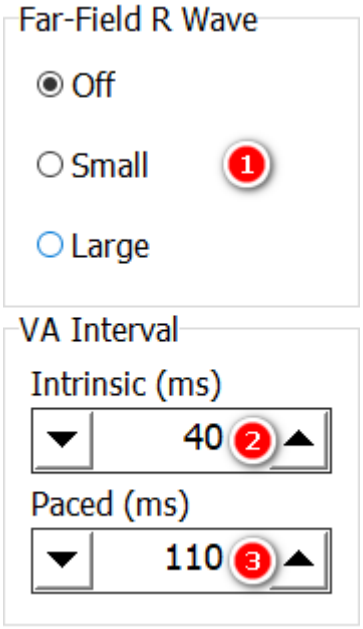
interference in the ventricular IEGM during the AV interval. If A-pace Crosstalk is checked in the Parameters menu, a large crosstalk signal appears in the ventricular IEGM.

A-Pace Crosstalk Latency
Use this to set the latency of the A-Pace Crosstalk signal. The range is from 0 ms to 50 ms.

A-Pace Crosstalk Width
Use this to set the width of the A-Pace Crosstalk signal. The range is from 5 ms to 100 ms.

Far-Field R Wave

The settings on the Far-Field R Wave tab control the appearance and delay of R waves in the atrial channel.



Far-Field R Wave Shape
Use this to set the shape of Far-Field R Waves.

- Off: no Far-Field R Wave in the atrial channel
- Small: a small Far-Field R wave appears in the atrial channel
- Large: a large Far-Field R wave appears in the atrial channel

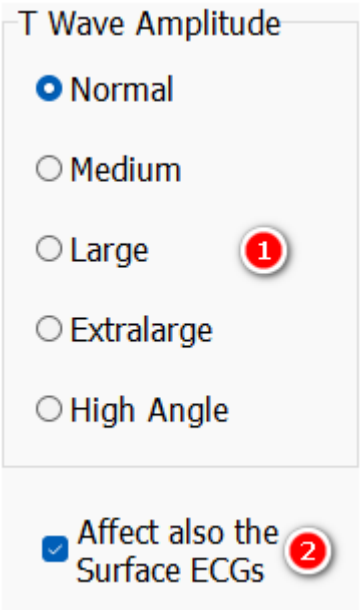
Delay of intrinsic Far-Field R Waves
Determines the delay of a Far-Field R Wave to an intrinsic R wave. The range is from 0 to 100 ms.

Delay of paced Far-Field R Waves
Determines the delay of a Far-Field R Wave to a paced R wave. The range is from 50 to 200 ms.

See also Number Fields.

T Wave Amplitudes

The settings on the Amplitude T Wave tab control the appearance of the T waves in the intraventricular and shock channels.



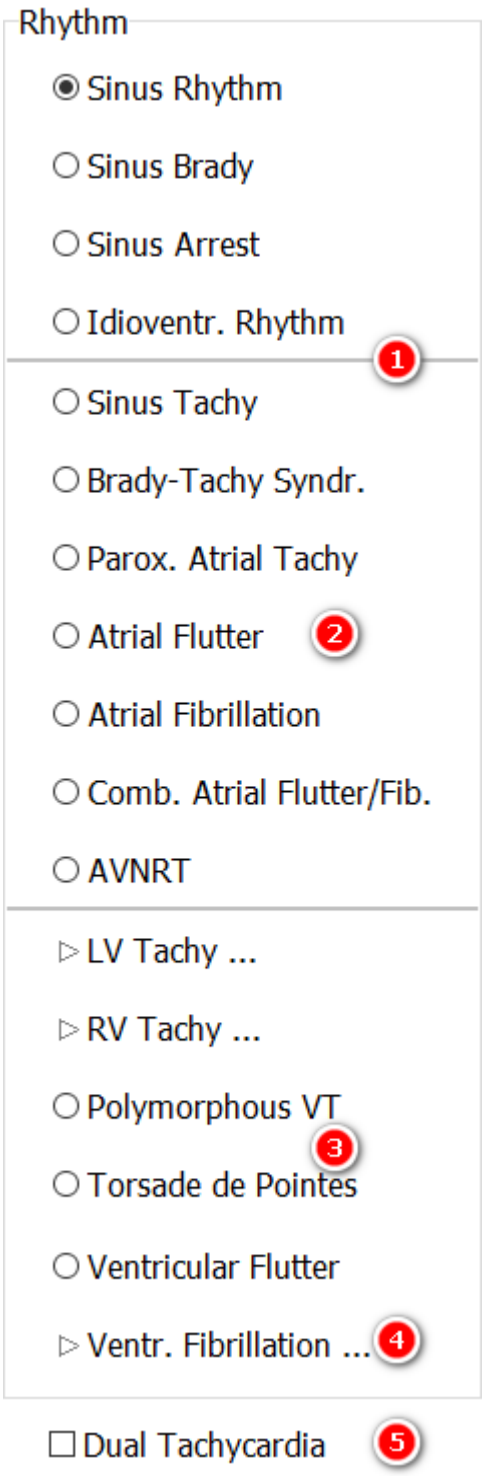
1 T Wave Amplitude
Use this to set the amplitude of the T wave.
High Angle is especially intended to show T wave oversensing.

2 Affect also the Surface ECGs
Prior to release in June 2025, T-wave amplitude only affected intracardiac EGMs. With this release, surface ECGs are also affected by default. The old behavior can be set by deselecting the checkbox.

Rhythms

The Rhythms Menu provides the different heart rhythms. See also Rhythm Characteristics.

Rhythms Menu



1 **List of predefined rhythms**
Select a rhythm from the list.

2 **List of atrial tachycardias**
The entries of this part of the list, except combined rhythms, can be used for dual tachycardias.

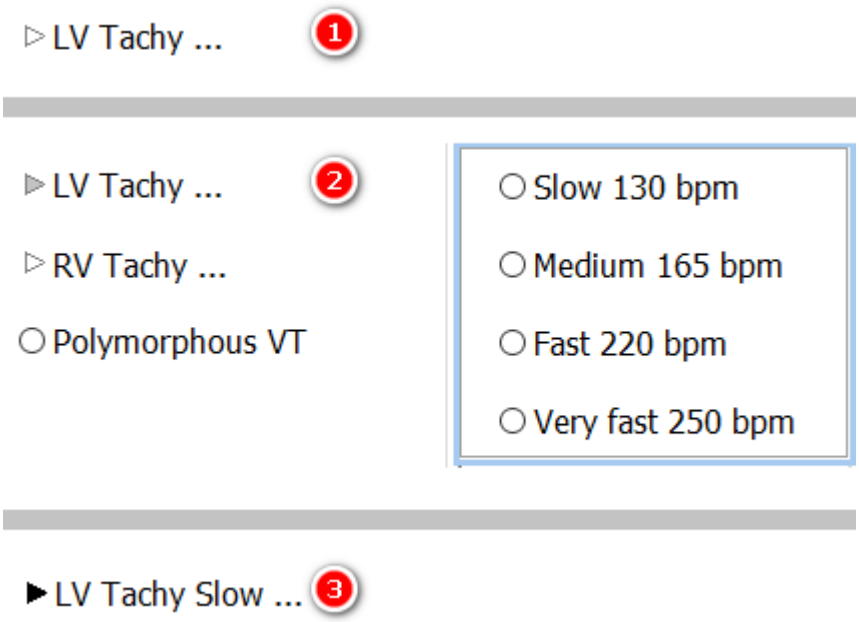
3 **List of ventricular tachycardias**
This list contains ventricular tachycardias.

4 **Entry that opens a submenu**
Entries that open a submenu are indicated by a triangle in front of the name.

5 **Dual Tachycardia**
Some of the atrial and ventricular tachycardic rhythms can be used in a dual tachycardia. This checkbox enables this behavior.

Rhythm Submenus

Some rhythm entries open a submenu.



1 **Entry with a submenu**
Entries that open a submenu are indicated by a small triangle in front of the rhythm name.

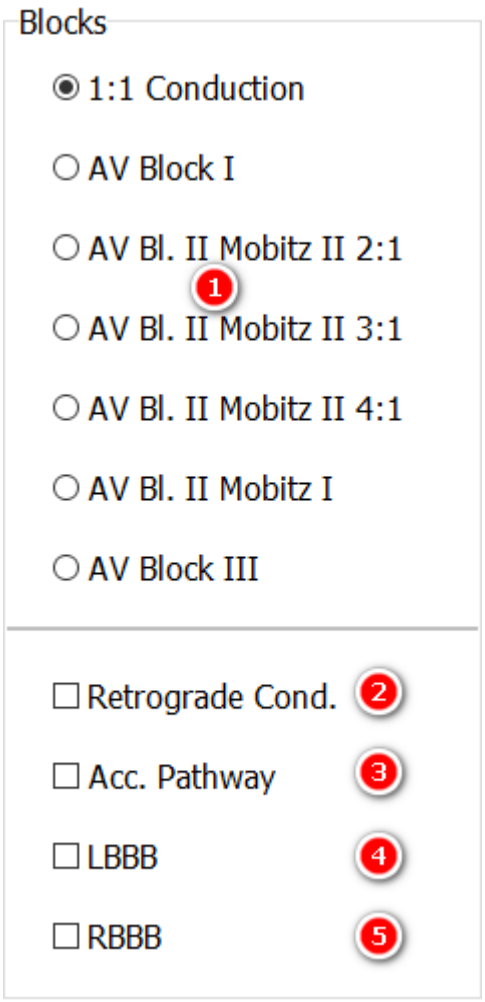
2 **Entry with an open submenu**
If the submenu is open, the triangle is grayed out.

3 **An item of the entry's submenu is selected**
If a submenu item is selected, the name of the rhythm changes to the selected item and the triangle is black.

Blocks

The Blocks Menu provides different atrio-ventricular conduction options. See Block Characteristics.

Blocks Menu



1 **List of AV Blocks**
Select an AV block from the list.

2 **Retrograde Conduction**
Use this checkbox to enable the retrograde conduction.

3 **Accessory Pathway**
Check this box to enable an accessory pathway between the atrium and the upper left ventricle. It is possible to demonstrate a reentry loop.

4 **LBBB**
Use this checkbox to establish a Left Bundle Branch Block.

5 **RBBB**
Use this checkbox to establish a Right Bundle Branch Block.

LBBB and RBBB cannot be checked at the same time. See also the RV-LV-Interval in the Left Ventricle Setup Dialog.

IF PM

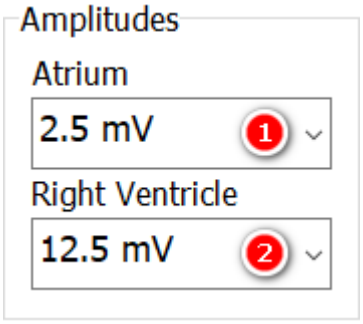
The Pacemaker Interface menu contains settings that directly control the interaction with pacemakers.

Left Ventricle Setup

All settings for the left ventricle are accessible via the Left Ventricle Setup 

button. This button is visible in the IF PM menu when a biventricular or a quadripolar device type is selected.

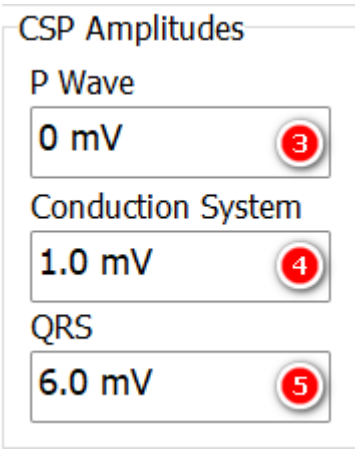
Amplitudes




Atrial Amplitude
Use this to set the maximal intra-atrial amplitude during sinus rhythm. The range is from 0.15 mV to 6.0 mV.
If the Expanded Voltage Range checkbox is selected, the range expands to 0.15 mV to 25.0 mV.


Right Ventricular Amplitude
Use this to set the maximal right intraventricular amplitude during sinus rhythm. The range is from 1 mV to 15.0 mV.
If the Expanded Voltage Range checkbox is selected, the range expands to 1 mV to 25.0 mV.

The rightt ventricle part of the menu changes as follows if a Conduction System devicetype has been selected.




P Wave Amplitude
Use this to set the maximal far-field P wave amplitude during sinus rhythm. The range is from 0 mV to 6.0 mV.

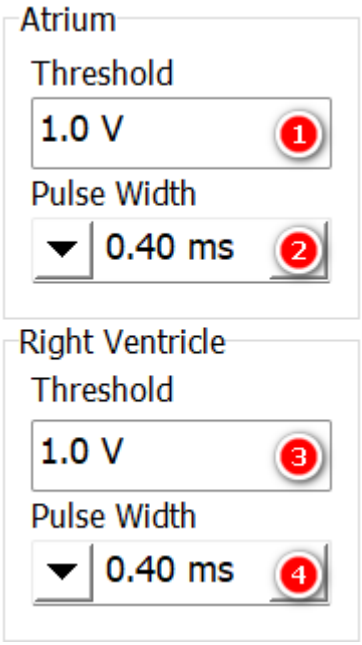

Conduction System Amplitude
Use this to set the maximal conduction system potential amplitude during sinus rhythm. The range is from 0.25

mV to 6.0 mV.

5 **QRS Amplitude**
Use this to set the maximal far-field QRS wave amplitude during sinus rhythm. The range is from 0 mV to 10.0 mV.

Thresholds

The simulator uses strength-duration curves for threshold calculation.



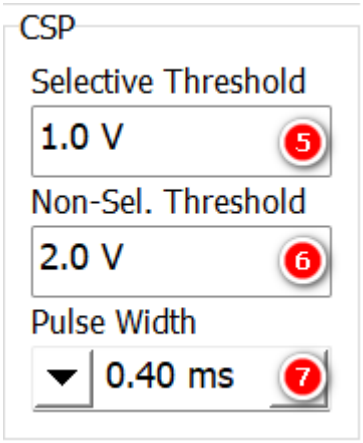
1 **Atrial Threshold**
Use this to set the threshold value of the atrial channel. The range is from 0.5 V to 3.75 V. Use n.c. if you do not want to have capture at all.
If a Temporary/External Device Type is selected, the range expands to 1 mV to 25.0 mV.
If Temporary/External Device Type and mA Thresholds are selected, the range changes to 0.1 mA to 20 mA.

2 **Pulse Width (ms)**
Use this to set the threshold pulse width of the atrial channel. The range is from 0.1 ms to 1.5 ns.

3 **Right Ventricular Threshold**
Use this to set the threshold value of the right intraventricular channel. The range is from 0.5 V to 3.75 V. Use n.c. if you do not want to have capture at all.
If a Temporary/External Device Type is selected, the range expands to 1 mV to 25.0 mV.
If Temporary/External Device Type and mA Thresholds are selected, the range changes to 0.1 mA to 20 mA.

4 **Pulse Width (ms)**
Use this to set the threshold pulse width of the atrial channel. The range is from 0.1 ms to 1.5 ns.

The right ventricle part of the menu changes as follows if a Conduction System devicetype has been selected.



The responses to conduction system pacing can vary depending on the size of the stimulation pulse and the position of the electrode. The input fields for the threshold voltage can be used to simulate the responses to the size of the stimulation pulse.

- Selective stimulation means that ventricular activation occurs solely via the conduction system.
- In non-selective pacing, ventricular activation is the result of a fusion between activation via the conduction system and local septal myocardial activation.

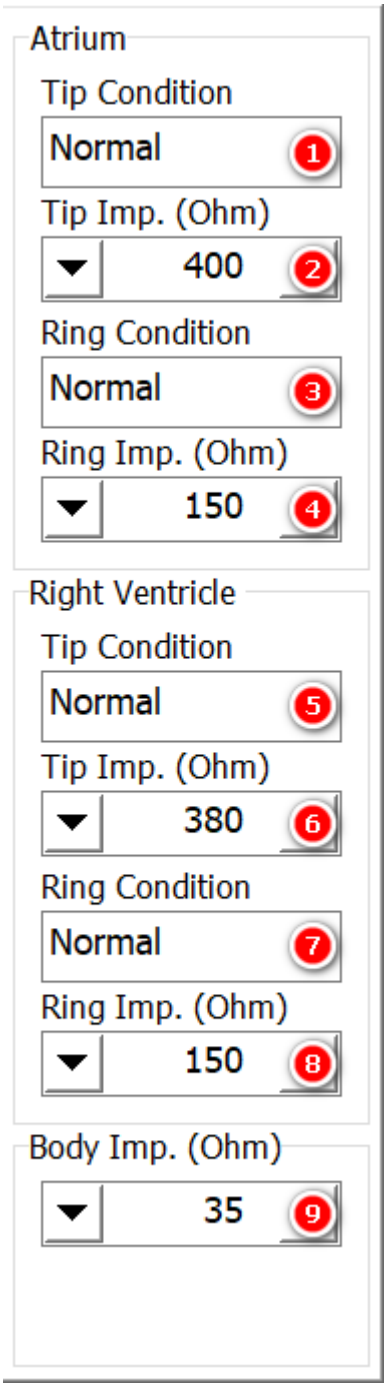
Selective CSP Threshold
Use this to set the threshold value for selective conduction system pacing. The range is from 0.5 V to 3.75 V. Use n.c. if you do not want to have capture at all.

Non-Selective CSP Threshold
Use this to set the threshold value for non-selective conduction system pacing. The range is from 0.5 V to 3.75 V. Use n.c. if you do not want to have capture at all.

CSP Pulse Width
Use this to set the threshold pulse width of the conduction system thresholds. The range is from 0.1 ms to 1.5 ns.

Impedances

Get some information how to calculate impedances.



Atrium Tip Defect Condition
Use this to set an electrode defect of the atrial tip strand. Possible values are Normal, Fracture, Leakage, Scar.

Atrium Tip Strand Impedance
For a normal condition, use this to set the impedance of the atrial tip strand. The range is from 150 Ω to 500 Ω.

Atrium Ring Defect Condition
Use this to set an electrode defect of the atrial ring strand. Possible values are Normal, Fracture, Leakage.

Atrium Ring Strand Impedance
For a normal condition, use this to set the impedance of the atrial ring strand. The range is from 150 Ω to 500 Ω.

Right Ventricle Tip Defect Condition
Use this to set an electrode defect of the right intraventricular tip strand. Possible values are Normal, Fracture, Leakage, Scar.

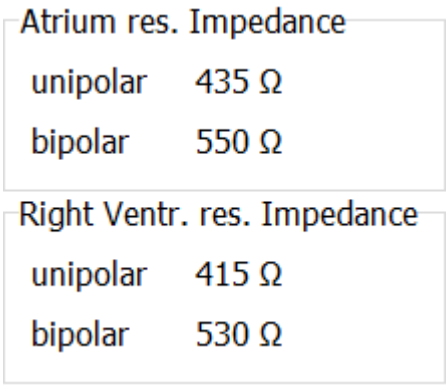
Right Ventricle Tip Strand Impedance
For a normal condition, use this to set the impedance of the right intraventricular tip strand. The range is from 150 Ω to 500 Ω.

Right Ventricle Ring Defect Condition
Use this to set an electrode defect of the right intraventricular ring strand. Possible values are Normal, Fracture, Leakage.

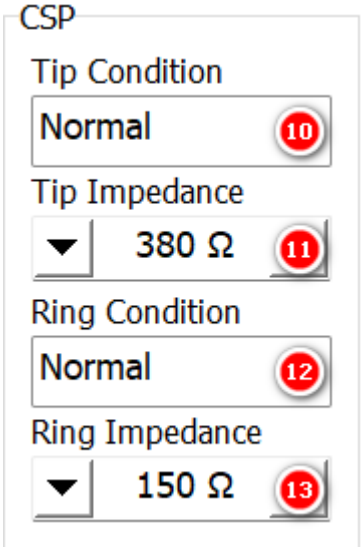
Right Ventricle Ring Strand Impedance
For a normal condition, use this to set the impedance of the right intraventricular ring strand. The range is from 150 Ω to 500 Ω.

Body Impedance
Use this to set the Body Impedance. The Body Impedance affects every unipolar pacemaker impedance. Possible Values are 15 Ω to 45 Ω.

The resulting impedances are shown in an extra panel.



The right ventricle part of the menu changes as follows if a Conduction System devicetype has been selected.



CSP Tip Defect Condition

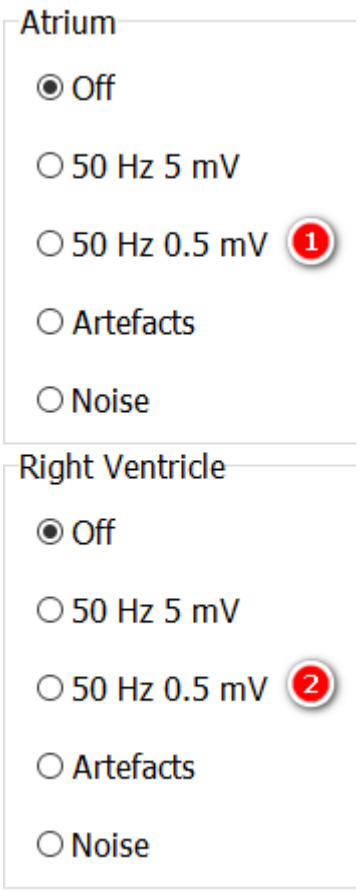
Use this to set an electrode defect of the conduction system tip strand. Possible values are Normal, Fracture, Leakage, Scar.

CSP Tip Strand Impedance
For a normal condition, use this to set the impedance of the conduction system tip strand. The range is from 150 Ω to 500 Ω.

CSP Ring Defect Condition
Use this to set an electrode defect of the conduction system ring strand. Possible values are Normal, Fracture, Leakage.

CSP Ring Strand Impedance
For a normal condition, use this to set the impedance of the conduction system ring strand. The range is from 150 Ω to 500 Ω.

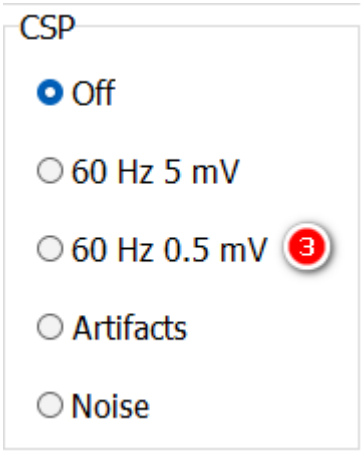
EMI



Atrial EMI
Use this to set the EMI of the atrial channel.

Right Ventricular EMI
Use this to set the EMI of the right intraventricular channel.

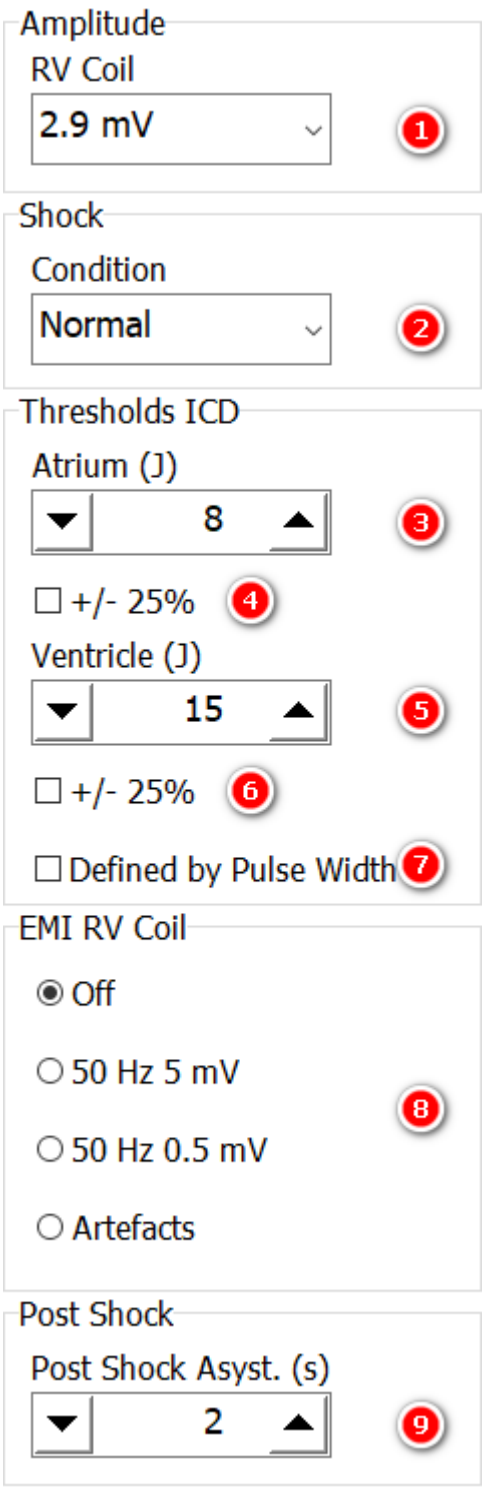
The right ventricle part of the menu changes as follows if a Conduction System devicetype has been selected.



3 **CSP EMI**
Use this to set the EMI of the conduction system channel.

IF ICD

The ICD Interface menu contains settings that directly control the interaction with ICDs.



1 **RV coil Amplitude**
Use this to set the maximal amplitude of the shock electrode during sinus rhythm. The range is from 0.2 mV to 4.0 mV.

2 **RV coil Defect Condition**
Use this to set a fracture of the shock (RV coil) electrode. Possible values are Normal, Fracture.

The software provides the options to choose different ICD thresholds for atrium and ventricle. The reaction of the application on ICD shocks depends on the relation between shock energy and threshold. See Antitachycardia pacing, Cardioversion, and Defibrillation.
Consider also that the **charged energy** will be programmed at most devices. In contrast, InterSim measures the

delivered energy.

 **Atrial ICD Threshold**
An atrial tachycardia will be terminated by a shock if the delivered energy is greater than this threshold in Joules.

 **Atrial ICD Threshold Variation**
This provides the option to vary randomly the Atrial ICD Thresholds in a range of +/- 25%.

 **Ventricular ICD Threshold**
A ventricular tachycardia will be terminated by a shock if the delivered energy is greater than this threshold in Joules.

 **Ventricular ICD Threshold Variation**
This provides the option to vary randomly the Ventricular ICD Thresholds in a range of +/- 25%.

 **Defined by Pulse Width**
Some ICD implants use special pulse widths to achieve better defibrillation. Check the box to show the benefits of this devices.

 **RV coil EMI**
Use this to set the EMI interference of the shock pathway.

 **Post Shock Asystole**
Use this to set the duration of an asystole after a delivered shock. The range is from 0 seconds to 180 seconds.

Macros

The Macros menu contains all commands necessary to deal with Simulator Macros. Consult the macro manual for a detailed explanation of the macro language.

New

The New command shows the Macro Execution Window in the right lower corner. A frame for a new macro will be created. If the window currently contains an unsaved macro, a dialog will appear, allowing the macro to be saved if desired.

Open

This menu item opens the Open Macro Dialog. If the Macro Execution Window currently contains an unsaved macro, a dialog will appear, allowing the macro to be saved if desired.

Save

The Save menu item saves a macro. If the macro has not been saved before, the Save As function will be used.

Save As

The Save As menu item opens the Save Macro Dialog.

Show Macro

The Show Macro menu item shows a hidden Macro Execution Window. If this window has not been shown before,

the New menu item will be used.

Hide Macro

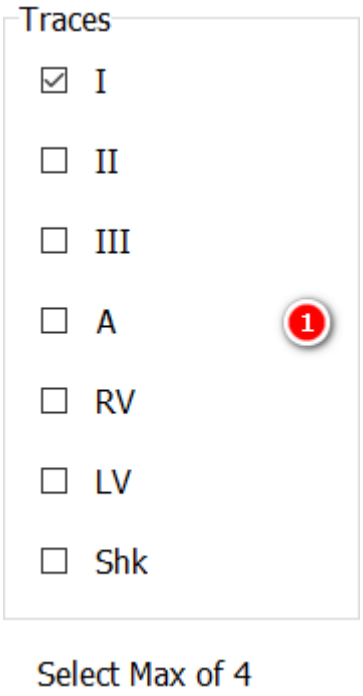
The Hide Macro menu item hides a visible Macro Execution Window. The macro itself will not be affected. Use this command if it is not necessary to watch the execution of the macro or if you want to hide the window temporarily for some reason. The Show Macro menu item displays the Macro Execution Window again.

List of Recent Macros

This list holds recently saved or loaded macros. Touch the filename of the macro you want to load again.

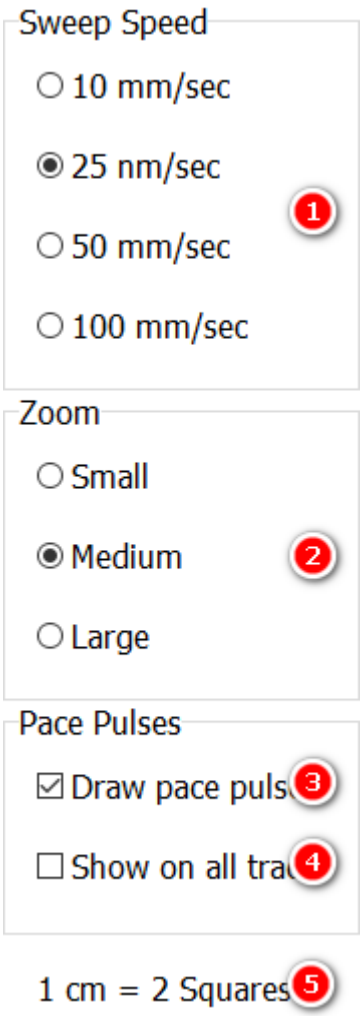
ECG

Traces



1 **List of available ECG Traces**
Select at most 4 out of 7 available traces. If you have selected 4 traces and want to select another one you must first unselect one. At least one trace must be selected. The available traces depend on the device type. Dual Chamber Devices don't have a LV trace.

Settings



1 **Sweep Speed**
Select the sweep speed in the ECG, 2 squares are the equivalent of 1 cm.

2 **Zoom**
Select the Zoom in the ECG.

If you select a Sweep Speed of 10 mm/s, the Zoom factor Small, and only 1 trace, you can see the ECG over an interval of more than 2 minutes.

Normalize

If the displayed ECG signals have an inappropriate amplification (signals are too small or are clipped) then press the Normalize button. The appropriate amplification will be determined based on the previous 10 seconds.

ECG is clipped:

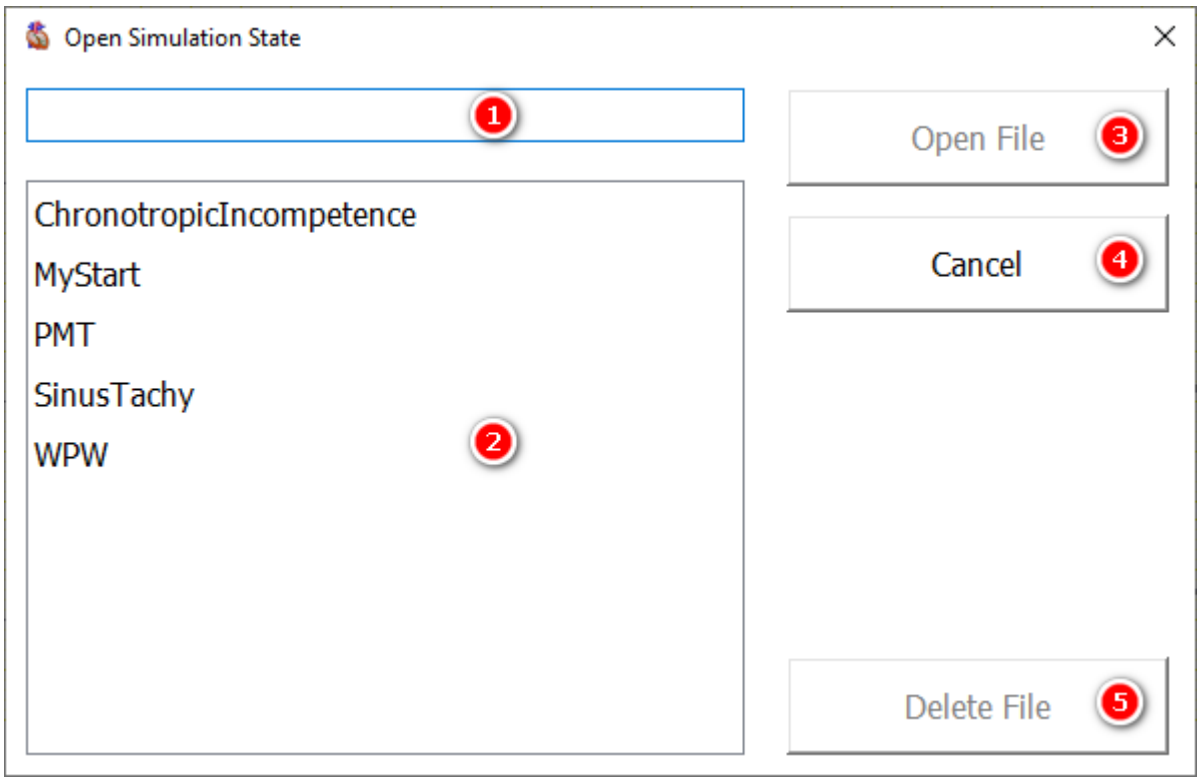
ECG is shown too small:

ECG has been normalized:

Simulation States

A Simulation State is like a snapshot of all current settings (rates, intervals, rhythms, blocks, thresholds, impedances, etc.). Previously saved states can be restored easily. It is possible to store as many states as the hard disc capacity allows.

Open Simulation State Dialog



Filter
Use this field to search for a state file. Type in all or part of the state file name. The file list will be filtered by this entry.

File List
Shows the available state files. If the Filter Field is not empty, all state files will be displayed which match this

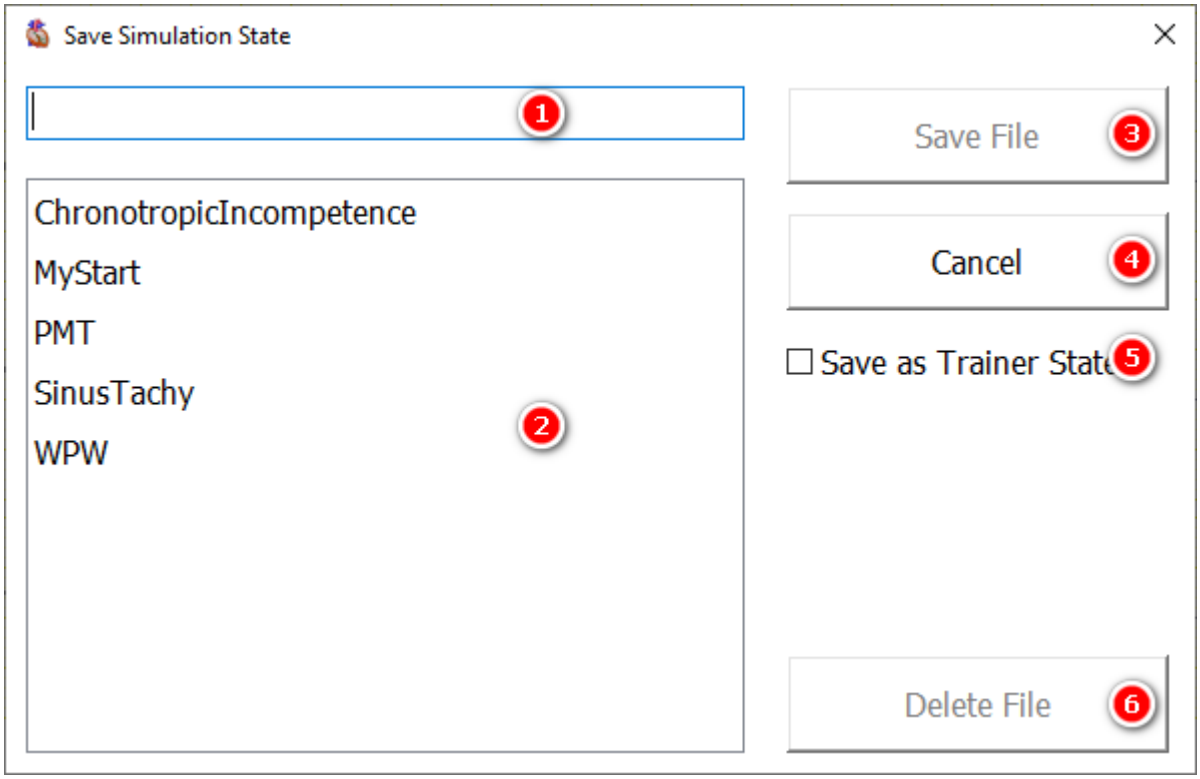
entry.
Scroll to the file you want to select. Touch the filename to open the file.

3 **Open File**
Opens the selected file and closes the dialog. The button is disabled if no file is selected.

4 **Cancel**
Closes the dialog without opening a state file.

5 **Delete File**
Deletes the selected file. The button is disabled if no file is selected. Before deleting, a confirmation dialog will appear.

Save Simulation State Dialog



1 **Filename Field**
Enter the filename (without extension) of the new State File.

2 **File List**
Shows the available state files. Scroll to the desired file. Touching a filename in the list will copy this entry into the Edit Field.

3 **Save File**
Creates a new State File. If the file already exists, a confirmation dialog will appear.

4 **Cancel**
Closes the dialog without saving a new state.

5 **Save as Trainer State**

Check this box if you want to create a Trainer State.

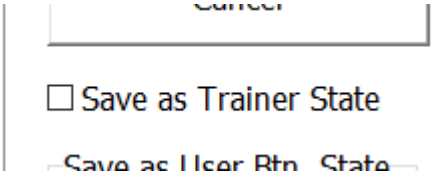
6 **Delete File**
Deletes the selected file. The button is disabled if no file in the file list is selected. Before deleting, a confirmation dialog will appear.

MyStart State

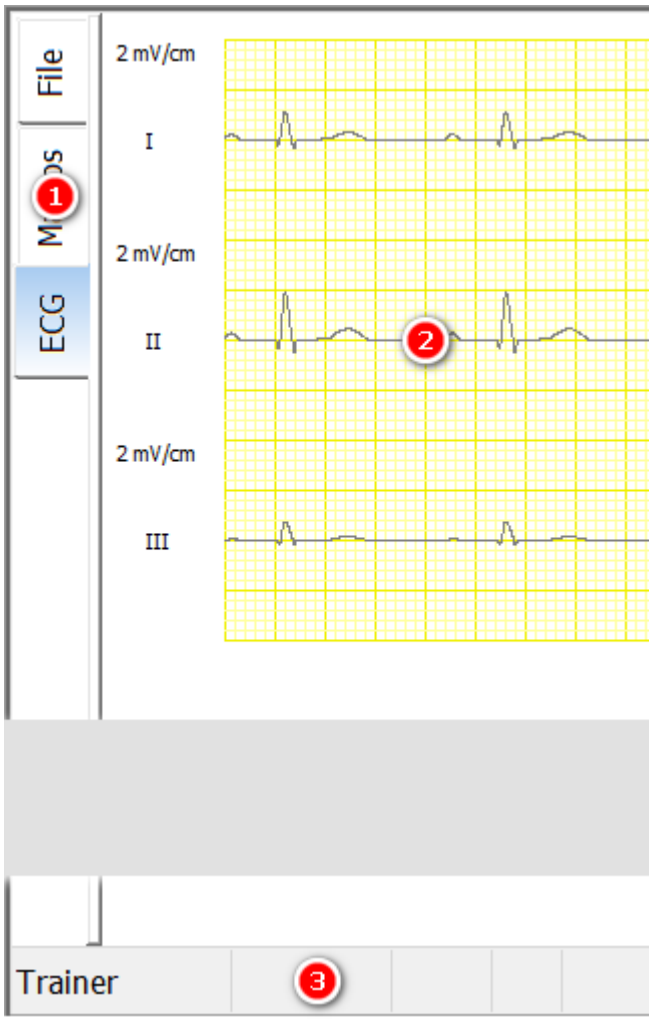
The MyStart State will always be loaded at program startup if prepared. Use the menu item Save as MyStart to create this state. Return to the MyStart state by usage of Reset to MyStart. Use the dialogs of menu items Open Simulation State, Save Simulation State, or File Dialog to delete the MyStart state.

Trainer States

A simulation state can be saved as Trainer State.



When a Trainer state is reloaded, most of the entries and controls will be invisible.



1 **Menu**

Only the File Menu, the Macro Menu, and the ECG Menu are available.

ECG
The ECG is still available when a Trainer State is loaded.

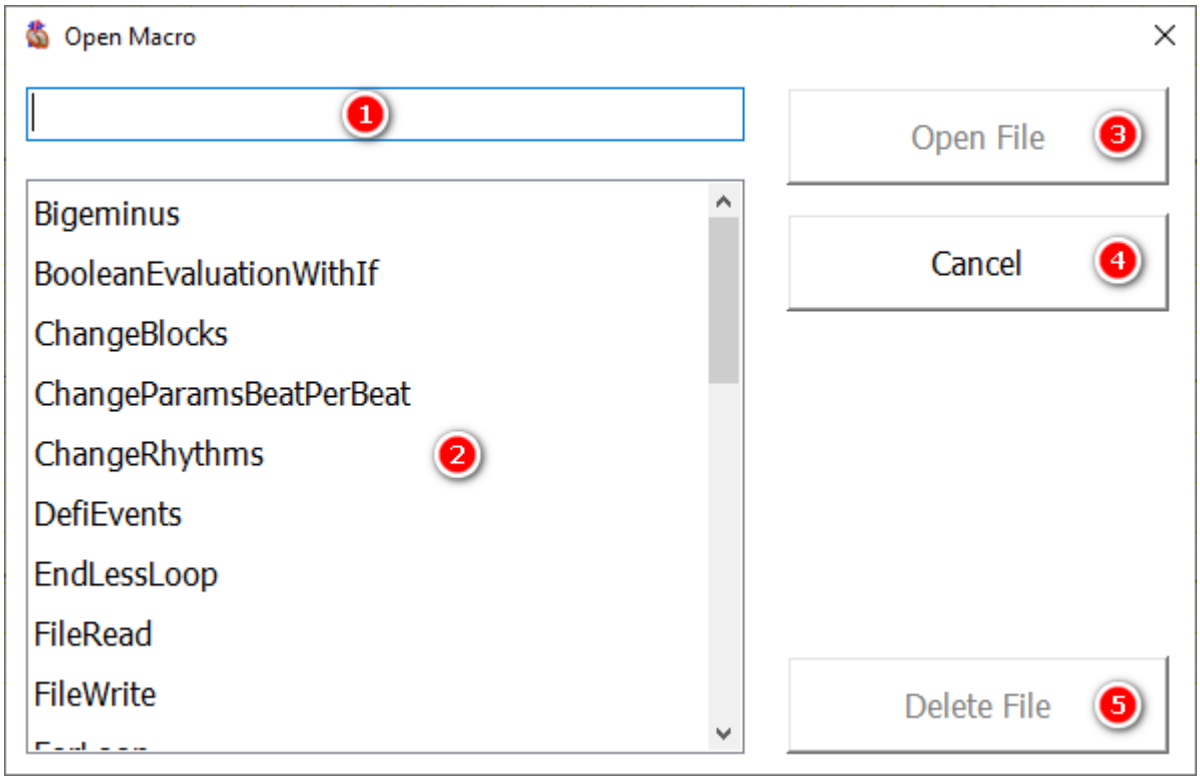
Status bar
All entries in the status bar are invisible.

Select End Trainer State in the File menu to show all invisible entries and controls again.

Macros

Open Macro Dialog

Open this dialog by touching Open in the Macro menu.



Filter
Use this field to search for a macro file. Type in all or part of the macro file name. The file list will be filtered by this entry.

File List
Shows the available macro files. If the filter is not empty, all macro files will be displayed which match this entry. Scroll to the desired file. Touch the filename to open it.

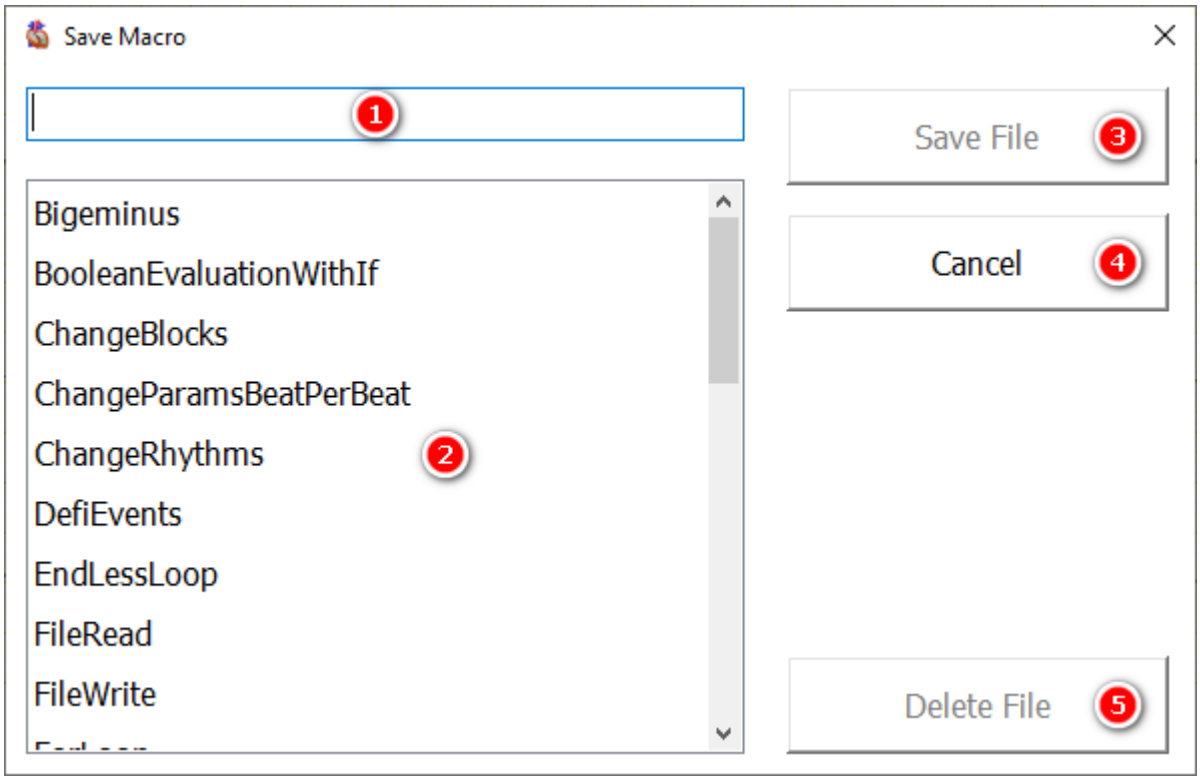
Open File
Opens the selected file and closes the dialog. The button is disabled if no file is selected.

Cancel

Closes the dialog without opening a macro file.

5 Delete File
Deletes the selected file. The button is disabled if no file is selected. Before deleting, a confirmation dialog will appear.

Save Macro Dialog



1 Filename Field
Enter the filename of the new macro file.

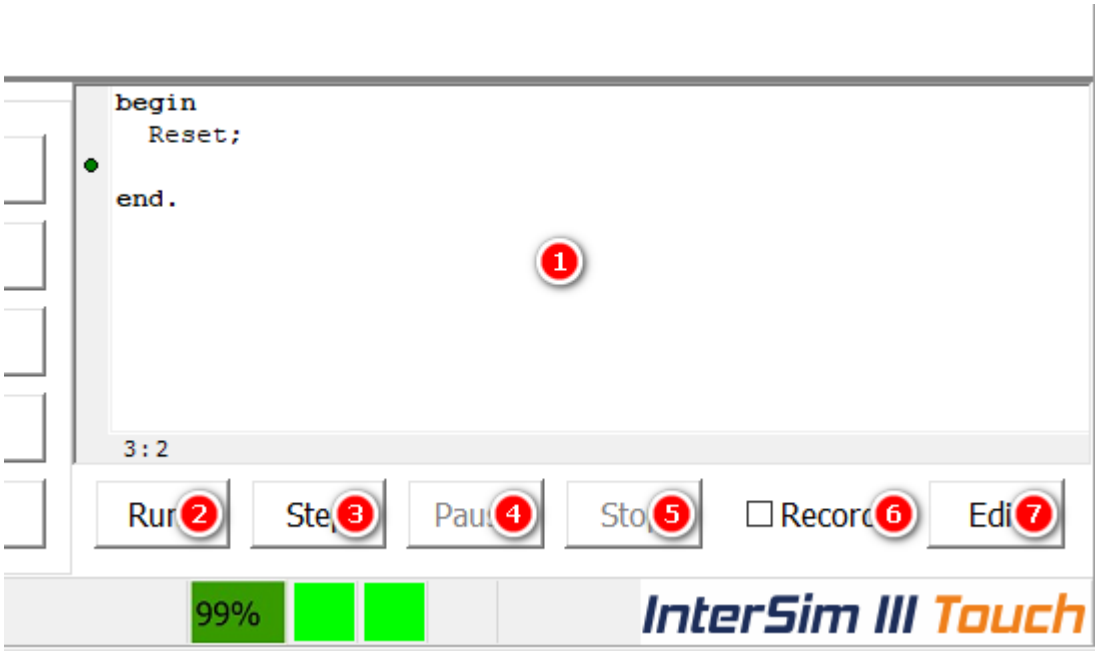
2 File List
Shows the available macro files. Scroll to the desired file. Touching a filename will copy this entry into the Edit Field.

3 Save File
Creates a new macro file. If the file already exists a confirmation dialog will appear.

4 Cancel
Closes the dialog without saving a macro.

5 Delete File
Deletes the selected file. The button is disabled if no file is selected. Before deleting, a confirmation dialog will appear.

Macro Execution Window



Macro Execution Window
The Macro Execution Window shows the currently loaded or created macro. The small green dot to the left of the text shows the position at which a new command will be inserted using the Record function. The dot turns red when the macro is running. In this case, the dot shows the command that is just beeing executed.

Run
Press this button to start a macro. The macro will not start if it contains an error. In this case the dot at the left shows the error position and the macro field in the status bar contains an error description.

Step
It is possible to execute a macro step by step by pressing this button.

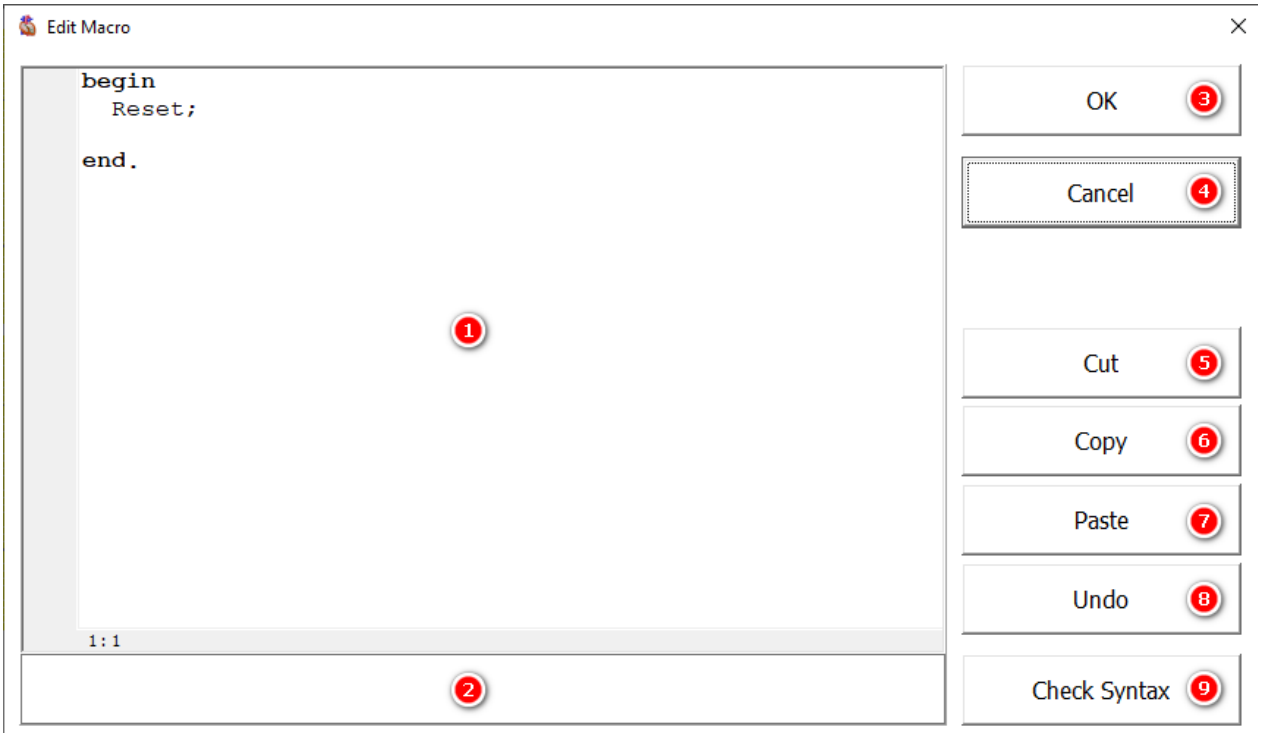
Pause
The Pause button will interrupt a running macro.

Stop
The Stop button terminates a long or endlessly running macro.

Record
Check this box to start the recording function. Every command taken or every parameter changed will be recorded by this function. The small green dot on the left indicates the position where the next entry will be inserted.

Edit
Press Edit to open the Edit Macro Window.

Edit Macro Window



Macro Edit Area
Use this area to edit the text of a macro.

Message Area
The message area contains the result of the syntax check.

OK
Confirms the changes to the macro and closes the window.

Cancel
Discards the changes to the macro and closes the window.

Cut
Cuts selected text into the clipboard.

Copy
Copies selected text into the clipboard.

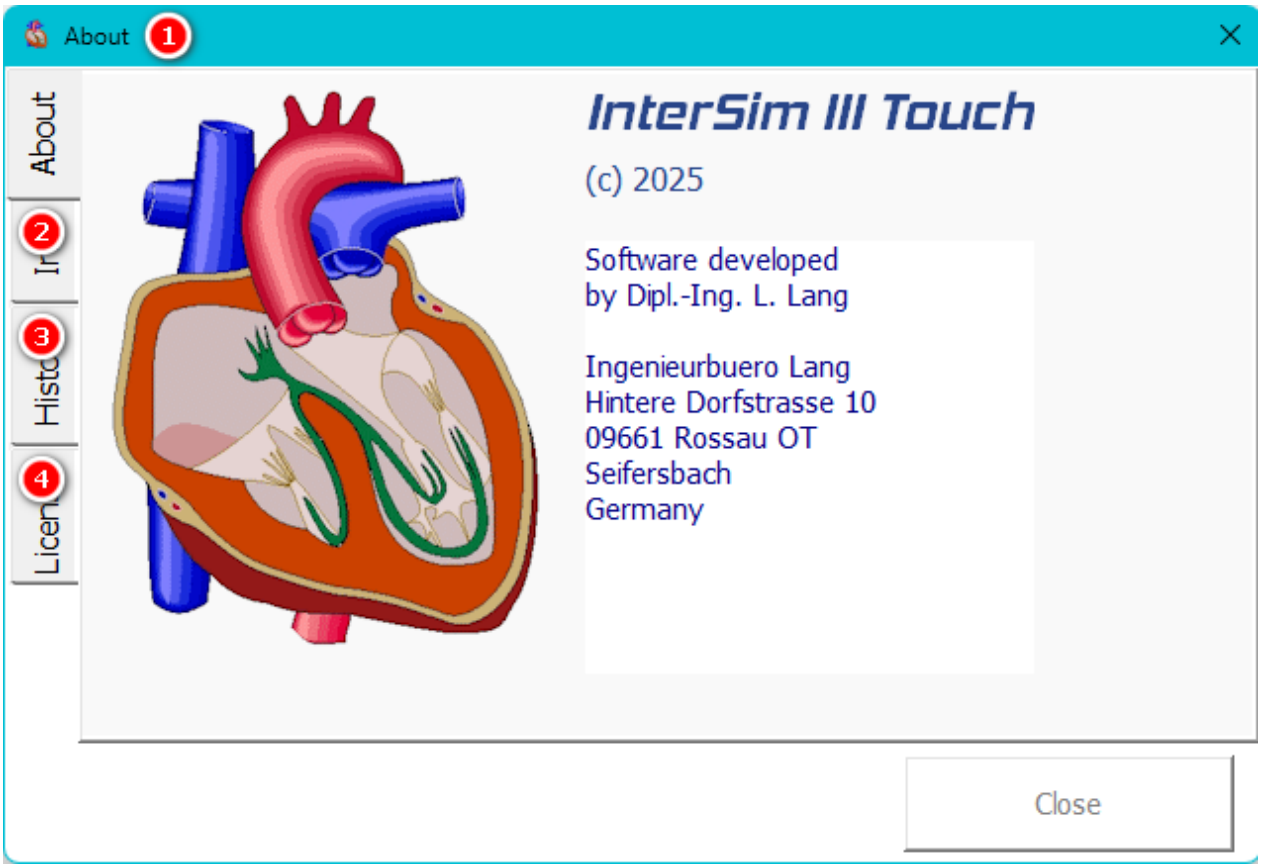
Paste
Pastes text from the clipboard.

Undo
Undoes the most recent edit.

Check Syntax
The Check Syntax button compiles the macro and reports any errors.

Dialogs

About Dialog



1 **About Dialog**
The About Dialog summarizes some information about the simulator.

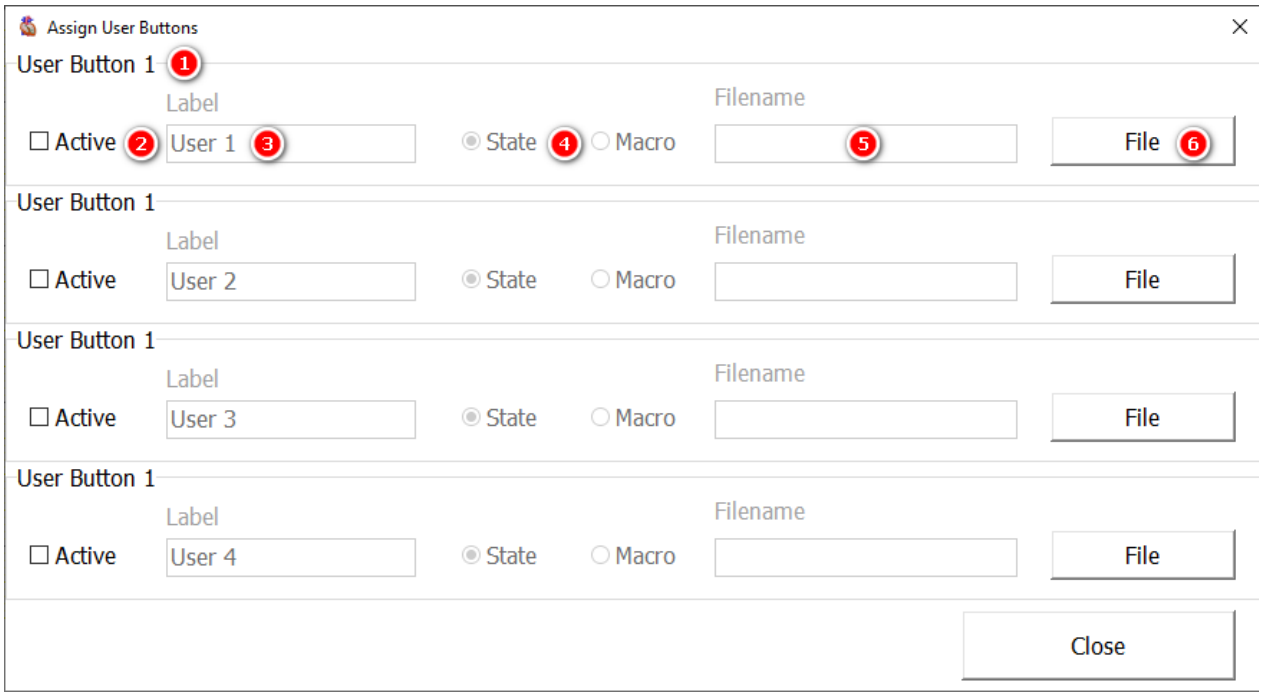
2 **Info Tab**
See the Info tab for information about application software and simulator hardware.

3 **History Tab**
The History tab has information about the latest changes.

4 **3rd Party Tab**
The 3rd Party tab has information about the third-party software used in the application.

Assign User Buttons Dialog

Use User Buttons for quick access to commonly used Simulation States or Macros. This dialog lets you assign appropriate States or Macros.



User Button 1-4
Select the User Button to which the State or Macro should be assigned.

Active
Select whether the User Button should be active or not.

Label
Enter the Label that should appear on the User Button.

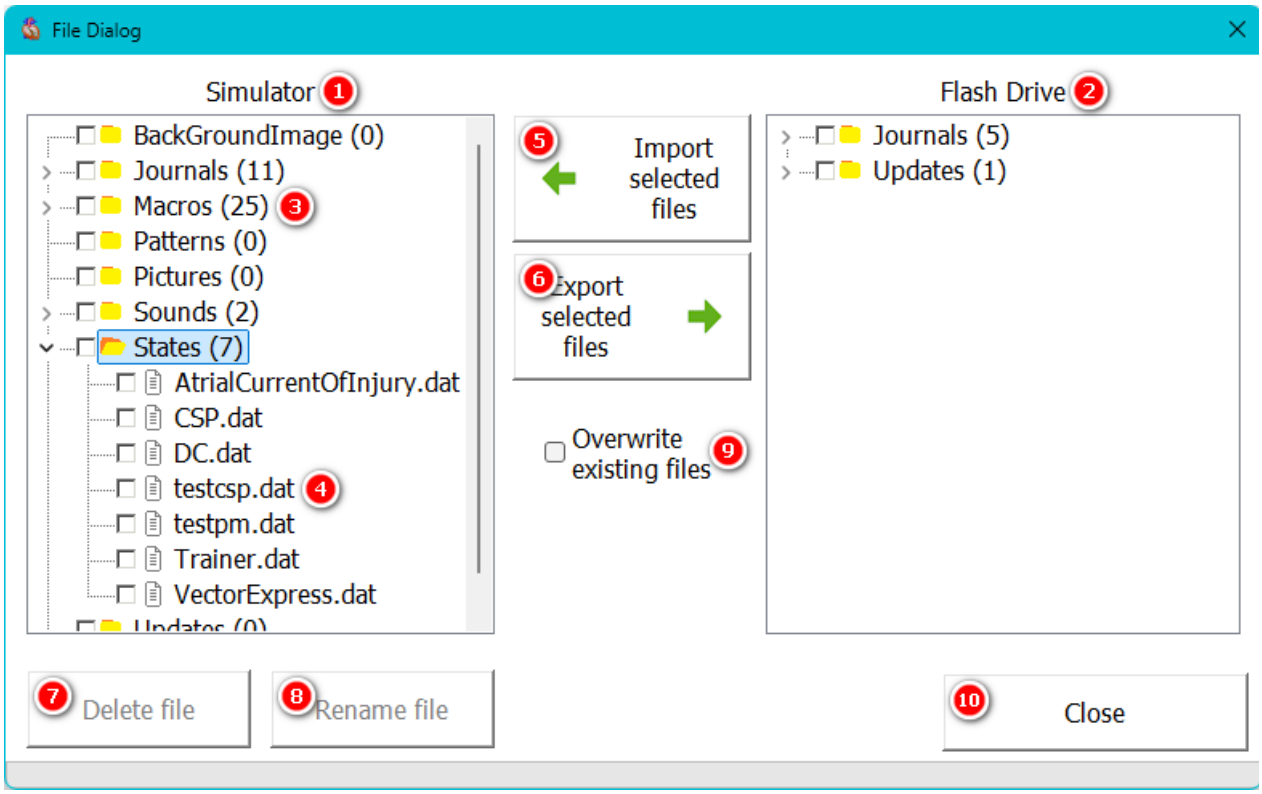
State/Macro
Choose State or Macro depending on what you want to assign.

Filename
This control shows the name of the selected file.

File Button
Press the button to select the file you want to assign to the user button.

File Dialog

The File Dialog appears after touching File Dialog in the File menu or after plugging in a USB stick.



1 Left pane with list of internal folders and files
The user accessible folders and files of the simulator are displayed in the left pane.
No file will be automatically selected.

2 Right pane with folders and files available on a USB stick
If a USB stick is connected, the available folders and files will be shown in the right pane.
Only folders whose names correspond to internal folders will be displayed.
Files in the BackgroundImage, Macros, Sounds, and States folders will be automatically selected if they do not exist in the corresponding internal folder.
Files in these folders will also be automatically selected if they have the same name and a different content.

3 Folder with checkbox, icon, folder name, and number of contained files
The yellow icon represents a folder. Check the box to select all files in the folder. Uncheck the box to deselect all files. The number in parentheses refers to the number of files in the folder.

4 File with checkbox, icon, and file name
The "document" icon represents a file. Check/uncheck the box to select/deselect the file. It is possible to select more than one file.

5 Import selected files
The Import button copies all selected files from the USB drive to the internal drive.

6 Export selected files
The Export button copies all selected files from the internal drive to the USB drive.

7 Delete file
The Delete file button deletes the first selected file from the internal drive.
It is not possible to delete folders and it is not possible to delete files or folders on the USB drive.
A confirmation dialog will appear before deleting the file.

Rename file
If you want to rename a file in the left pane, select this file and press the Rename File button. The Rename File Dialog will appear.

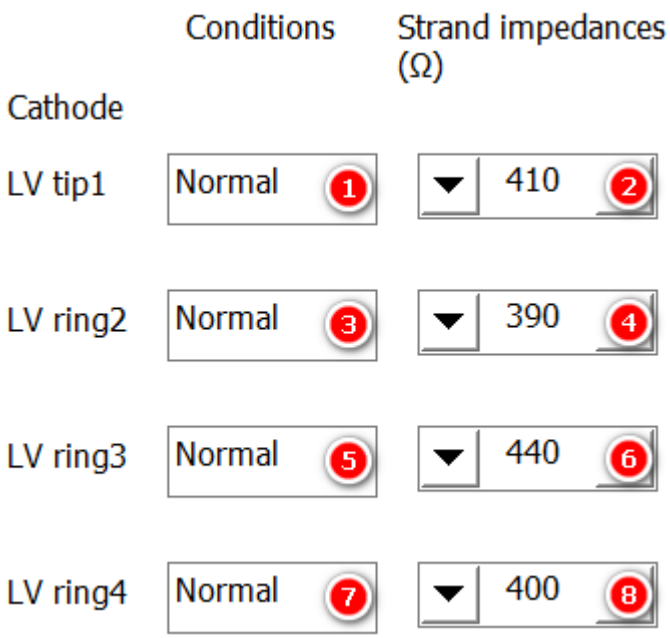
Overwrite
If you attempt to copy a file and a file with the same name already exists in the destination folder, then a unique filename will be created. You can change this behavior by checking this box.

Close
Press this button to close the dialog.

Left Ventricle Setup Dialog

Impedances

The annotated picture is part of the Left Ventricle Setup Dialog. The cathodes LV ring3 and ring4 are disabled for biventricular devices.
See Impedances for instructions on calculating impedances. The resulting impedances are shown in the threshold matrix.



LV Tip1 Defect Condition
Use this to set an electrode defect of the left ventricular tip 1 strand. Possible values are Normal, Fracture, Leakage.

LV Tip1 Strand Impedance
For a normal condition, use this to set the impedance of the left ventricular tip 1 strand. The range is from 150 Ω to 500 Ω.

LV Ring2 Defect Condition
Use this to set an electrode defect of the left ventricular ring 2 strand. Possible values are Normal, Fracture, Leakage.

4 LV Ring2 Strand Impedance
For a normal condition, use this to set the impedance of the left ventricular ring 2 strand. The range is from 150 Ω to 500 Ω.

5 LV Ring3 Defect Condition
Use this to set an electrode defect of the left ventricular ring 3 strand. Possible values are Normal, Fracture, Leakage.

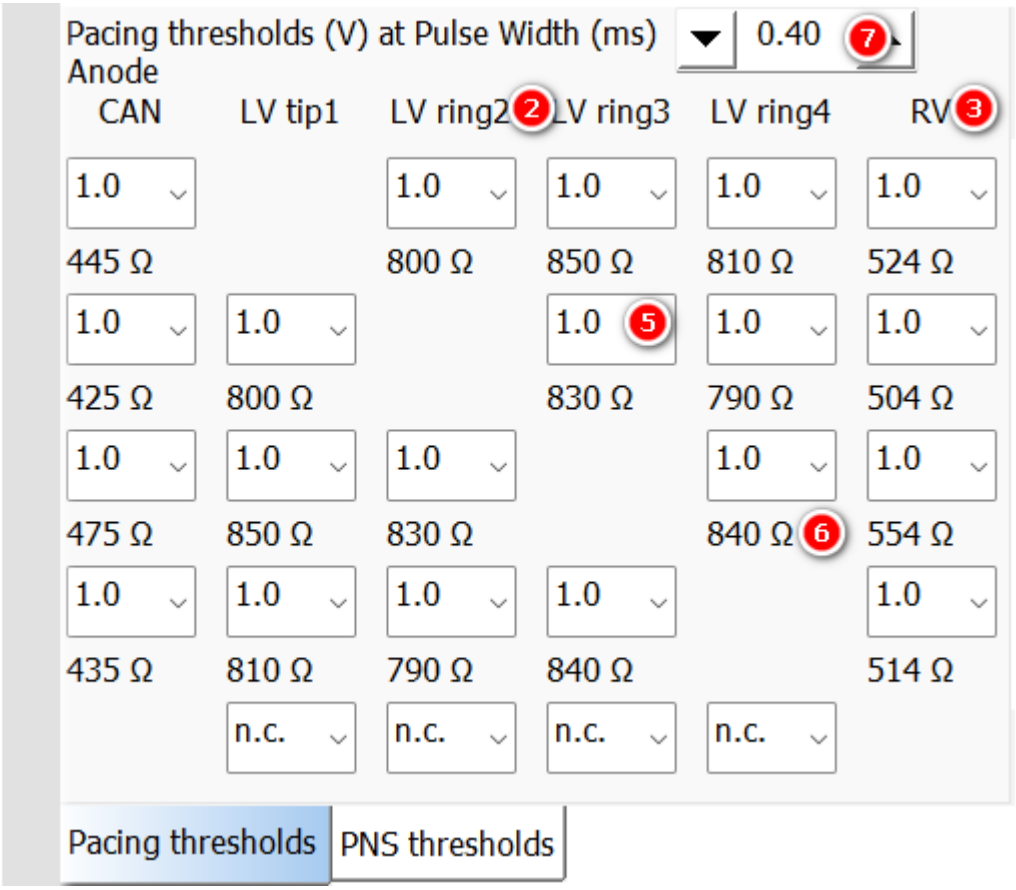
6 LV Ring3 Strand Impedance
For a normal condition, use this to set the impedance of the left ventricular ring 3 strand. The range is from 150 Ω to 500 Ω.

7 LV Ring4 Defect Condition
Use this to set an electrode defect of the left ventricular ring 4 strand. Possible values are Normal, Fracture, Leakage.

8 LV Ring4 Strand Impedance
For a normal condition, use this to set the impedance of the left ventricular ring 4 strand. The range is from 150 Ω to 500 Ω.

Pacing Thresholds

The annotated picture is part of the Left Ventricle Setup Dialog. The cathodes and anodes LV ring3 and ring4 are disabled for biventricular devices.
The simulator uses strength-duration curves for threshold calculation.



1 Cathodes for Threshold Matrix

Each threshold row corresponds to a cathode.

2 Anodes for Threshold Matrix
Each threshold column corresponds to an anode.

3 RV Anode
The RV column stands for two different anodes. For pacemakers and CRT-Ps, it refers to the RV ring anode. For CRT-D devices, it refers to the RV coil.

4 Threshold Row for Anodal Pacing
Use the values in this row to show anodal pacing.

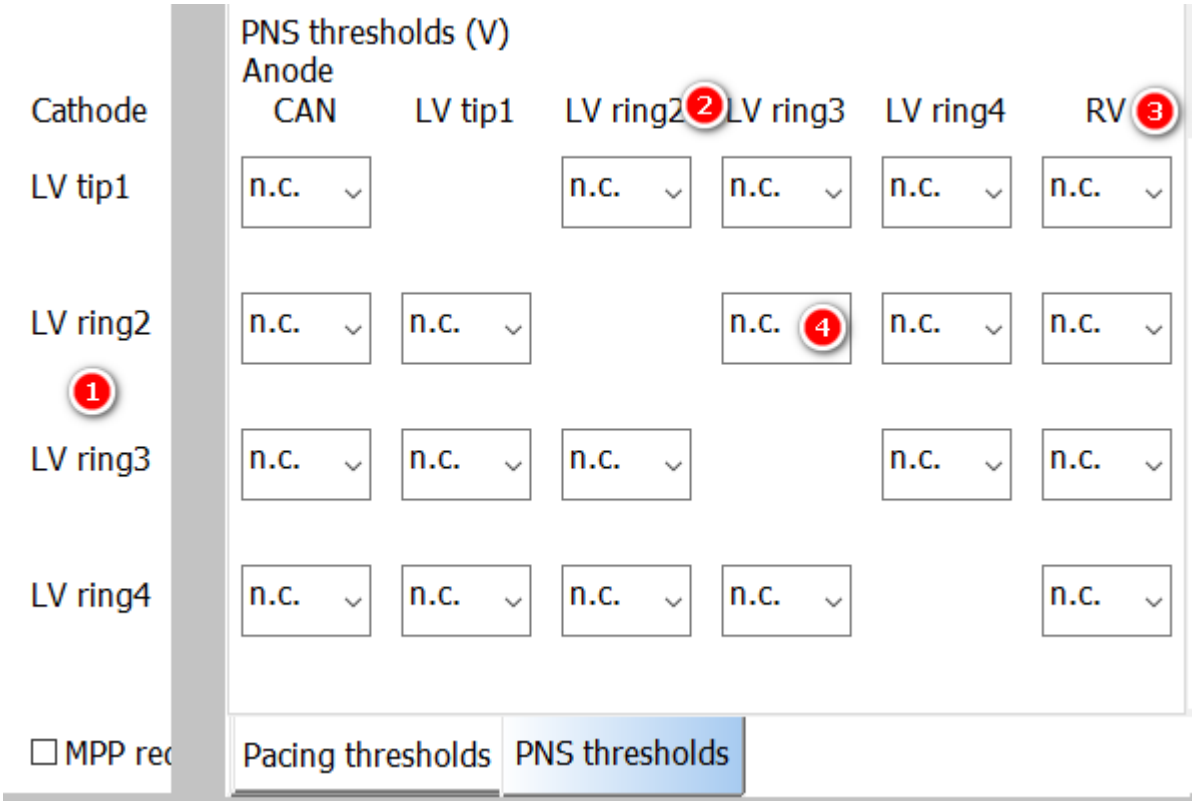
5 LVRing2-LVRing3 Threshold
This is an example how to read the matrix. This special value is the threshold for the LV ring2 cathode and the LV ring3 anode.

6 LVRing3-LVRing4 Resulting Impedance
The resulting impedances are also displayed in the matrix. The example shows the resulting impedance between LV ring3 and LV ring4.

7 Pulse Width (ms)
The pulse width refers to all pacing thresholds in this dialog.

PNS Thresholds

The annotated picture is part of the Left Ventricle Setup Dialog. The cathodes and anodes LV ring3 and ring4 are disabled for biventricular devices.
Phrenic nerve stimulation is effective if the voltage exceeds the selected value.



Cathodes for PNS Threshold Matrix
Each threshold row corresponds to a cathode.

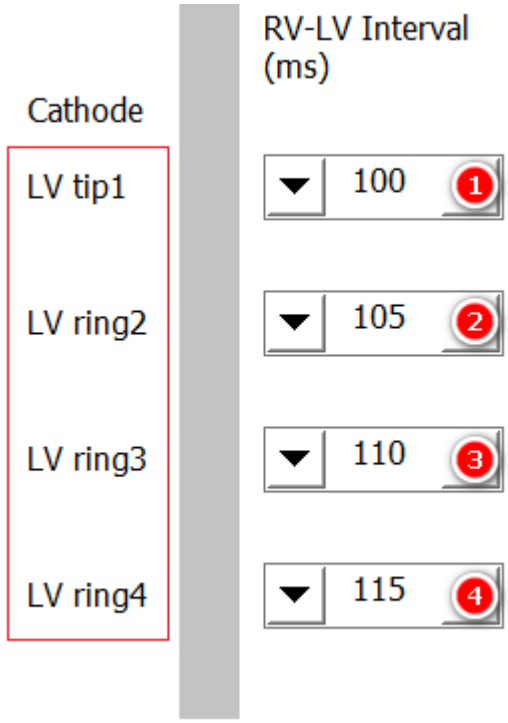
Anodes for PNS Threshold Matrix
Each threshold column corresponds to an anode.

RV Anode
The RV column stands for two different anodes. For pacemakers and CRT-Ps, it refers to the RV ring anode. For CRT-D devices, it refers to the RV coil.

LVRing2-LVRing3 PNS Threshold
This is an example how to read the matrix. This special value is the threshold for the cathode LV ring2 and the anode LV ring3.

RV-LV Intervals

The annotated picture is part of the Left Ventricle Setup Dialog. The cathodes and anodes LV ring3 and ring4 are disabled for biventricular devices.



RV-LV Interval of LV tip1
Use this to set the RV-LV Interval of the left ventricular tip 1 strand. The range is from 10 ms to 160 ms. The default is 100 ms for LBBB and RBBB.

RV-LV Interval of LV ring2
Use this to set the RV-LV Interval of the left ventricular ring 2 strand. The range is from 10 ms to 160 ms. The default is 105 ms for LBBB and 95 ms for RBBB.

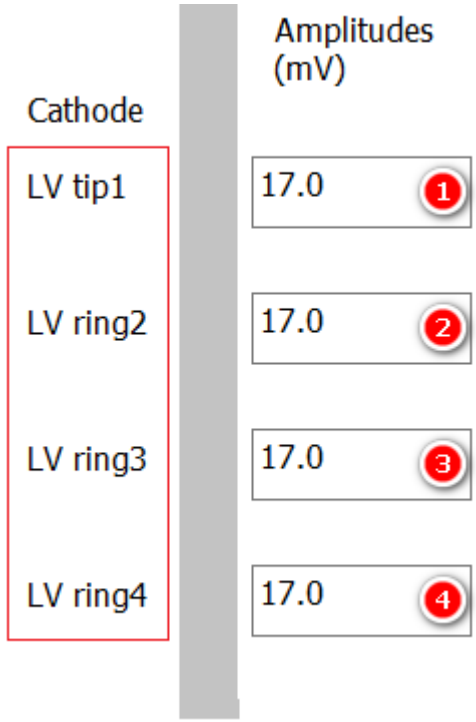
RV-LV Interval of LV ring3
Use this to set the RV-LV Interval of the left ventricular ring 3 strand. The range is from 10 ms to 160 ms. The default is 110 ms for LBBB and 90 ms for RBBB.

RV-LV Interval of LV ring4
Use this to set the RV-LV Interval of the left ventricular ring 4 strand. The range is from 10 ms to 160 ms. The default is 115 ms for LBBB and 85 ms for RBBB.

In case of a RBBB, the controls determine the LV-RV intervals.

Amplitudes

The annotated picture is part of the Left Ventricle Setup Dialog. The cathodes and anodes LV ring3 and ring4 are disabled for biventricular devices.



Amplitude of LV tip1
Use this to set the amplitude of LV tip1. Possible values are in the range from 1 mV to 15 mV. The default value is 12.5 mV.

Amplitude of LV ring2
Use this to set the amplitude of LV ring2. Possible values are in the range from 1 mV to 15 mV. The default value is 12.5 mV.

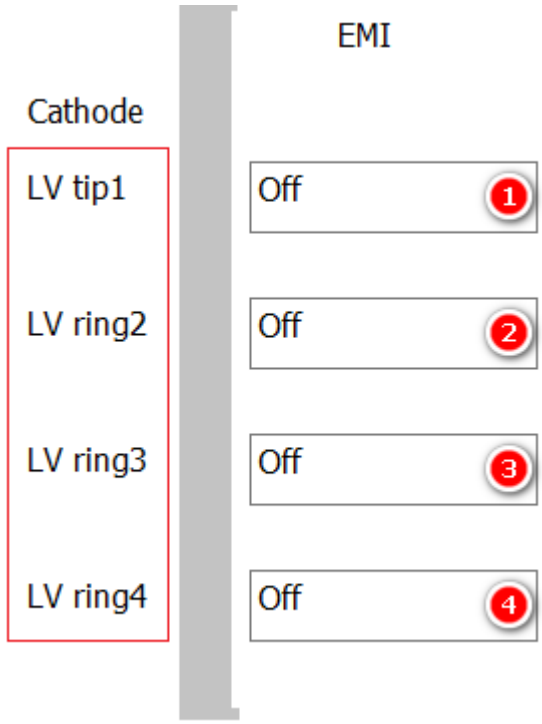
Amplitude of LV ring3
Use this to set the amplitude of LV ring3. Possible values are in the range from 1 mV to 15 mV. The default value is 12.5 mV.

Amplitude of LV ring4
Use this to set the amplitude of LV ring4. Possible values are in the range from 1 mV to 15 mV. The default value is 12.5 mV.

The amplitudes are valid for a sensing between the appropriate cathode and CAN. If you use another anode, the measured value will be affected by the amplitude of this anode and also by the chosen RV-LV delays. **The measured signal will be zero if the amplitudes and the RV-LV delays for the incorporated electrodes are equal.**

EMI

The annotated picture is part of the Left Ventricle Setup Dialog. The cathodes and anodes LV ring3 and ring4 are disabled for biventricular devices.



EMI settings of LV tip1
Use this to set EMI for LV tip1. Possible values are Off, 50 Hz 5 mv, 50 Hz 0.5 mV, Artifacts, and Noise.

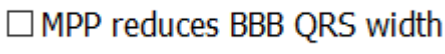
EMI settings of LV ring2
Use this to set EMI for LV ring2. Possible values are Off, 50 Hz 5 mv, 50 Hz 0.5 mV, Artifacts, and Noise.

EMI settings of LV ring3
Use this to set EMI for LV ring3. Possible values are Off, 50 Hz 5 mv, 50 Hz 0.5 mV, Artifacts, and Noise.

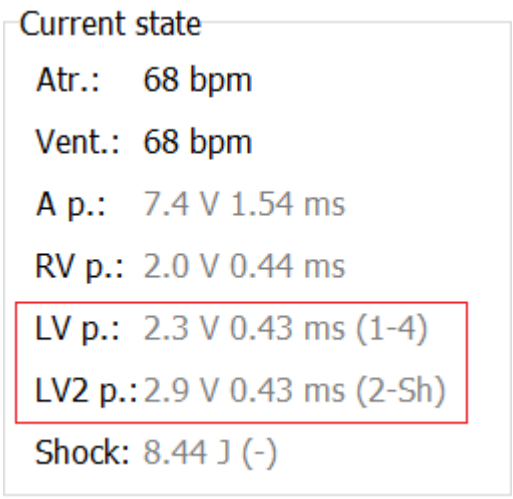
EMI settings of LV ring4
Use this to set EMI for LV ring4. Possible values are Off, 50 Hz 5 mv, 50 Hz 0.5 mV, Artifacts, and Noise.

Multi Point Pacing

The annotated picture is part of the Left Ventricle Setup Dialog.
It is possible to show the benefit of multi point pacing.



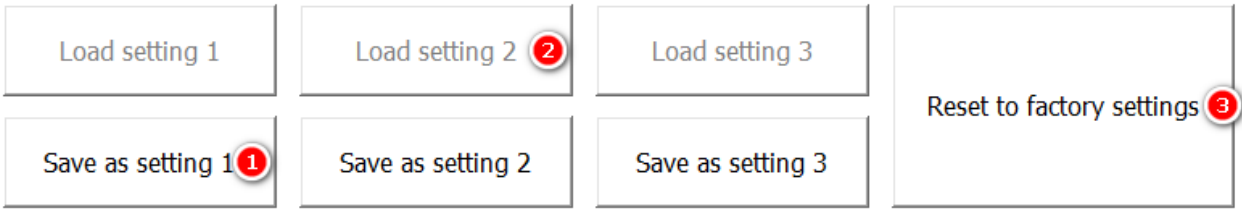
Check the box if you use a MPP capable device. If the device is programmed for MPP, both stimuli will be shown in the Current State box.



With the MPP box checked, biventricular only pacing will reduce the QRS width to a minimal value of 130 ms. Multi point pacing will further reduce the QRS width to about 120 ms.

Settings

The annotated picture is part of the Left Ventricle Setup Dialog.
A Left Ventricular Setup Setting is a kind of a reduced Simulation State. A setting contains all parameters that belongs to the Left Ventricle Setup. This allows quick access to often used left ventricular settings.



Save a Setting
Saves all parameters displayed in the window as a Setting.

Load a Setting
Reloads a previously saved Setting.

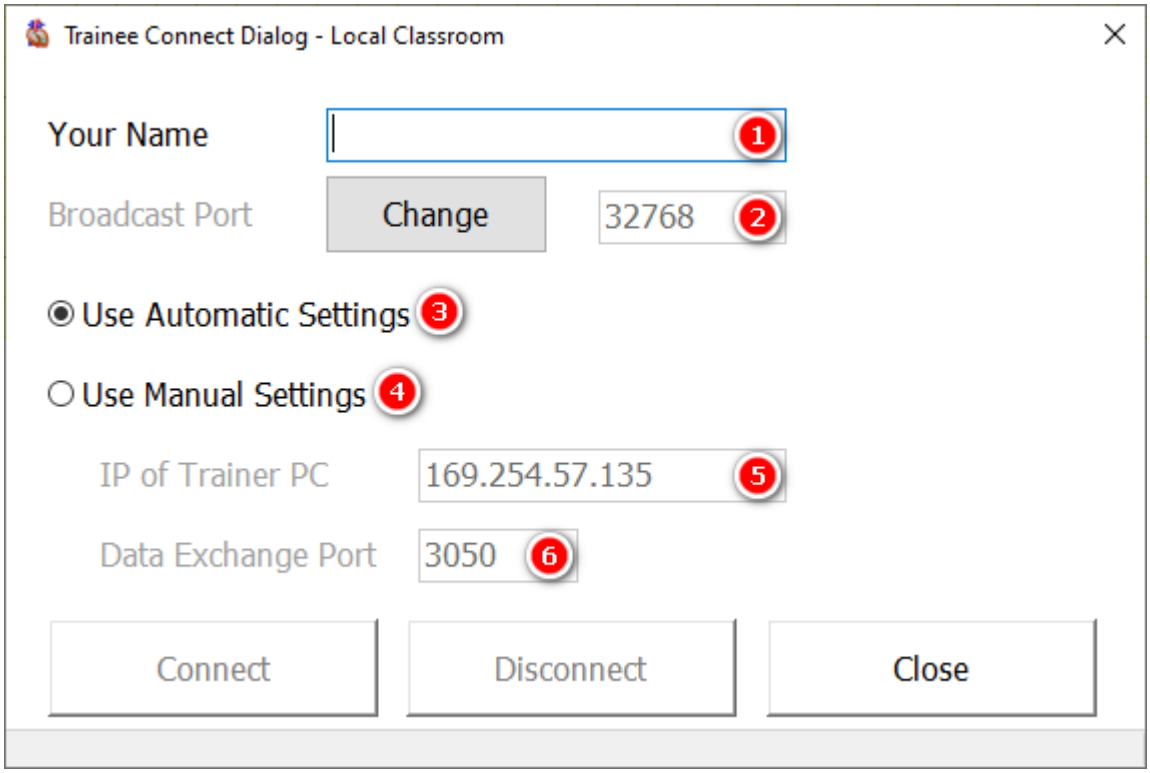
Reset to Factory Settings
Resets all parameters in the window to the default values.

Note that a Simulation State incorporates a set of left ventricular parameters, but a Left Ventricular Setting contains only the simulation parameters contained in the Left Ventricular Setting window.

Local Classroom Connect Dialogs

The Local Classroom Connect Dialogs are opened by the corresponding File Menu items when the Local Classroom has been selected in the System Dialog Window.

Trainee Connect Dialog



1 **Your Name**
Each trainee must enter a name of their choice of at least 3 characters.

2 **Broadcast Port**
It should not be necessary to change the Broadcast Port. It is used to find the Trainer PC automatically in the network.

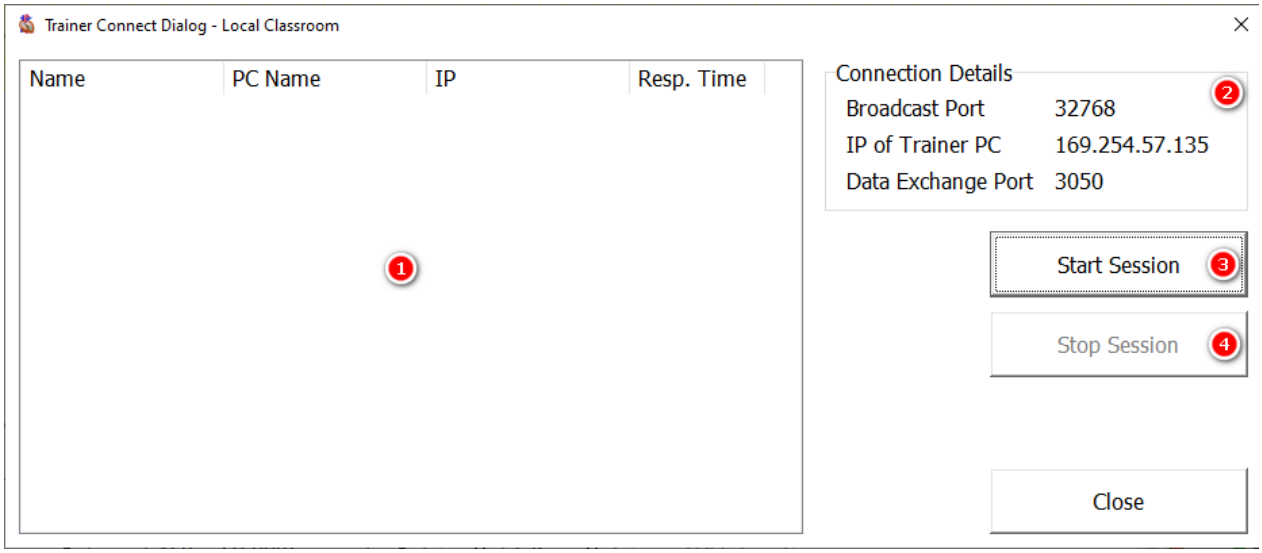
3 **Use Automatic Settings**
Use this to let InterSim connect automatically to the Trainer PC.

4 **Use Manual Settings**
Use this if an automatic connection is not successful.

5 **IP of Trainer PC**
The IP of the Trainer PC is necessary for a manual connection.

6 **Data Exchange Port**
It should not be necessary to change the Data Exchange Port. It is used to communicate with the Trainer PC.

Trainer Session Dialog



Connected Users
This table shows details of connected users:

- Name: the name used by the trainee.
- PC Name: the name of the PC the trainee is working with.
- IP: the IP address assigned to the trainee's PC.
- Resp. Time: The column shows the response time of the trainee's PC. This time should not be much more than 10 ms.

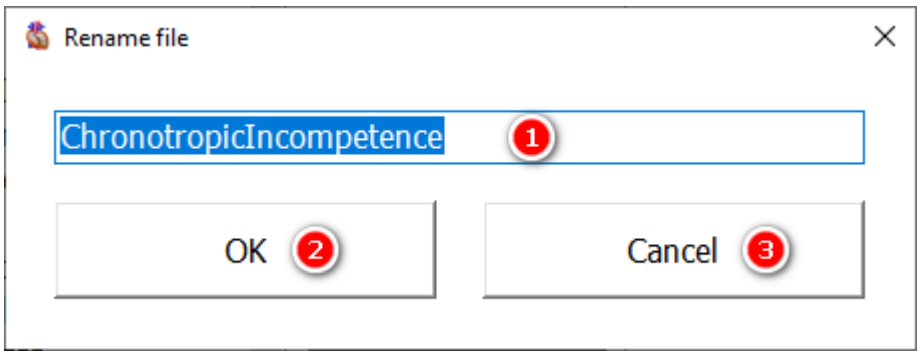
Connection Details
See the summary of the data used.

Start Session
Starts a session in the local classroom.

Stop Session
Ends a session in the local classroom.

Rename File Dialog

The Rename File Dialog appears after pressing the Rename File Button in the File Dialog. It's only possible to rename files which are stored on the simulator. Only the file name will be changed, the extension will be kept.



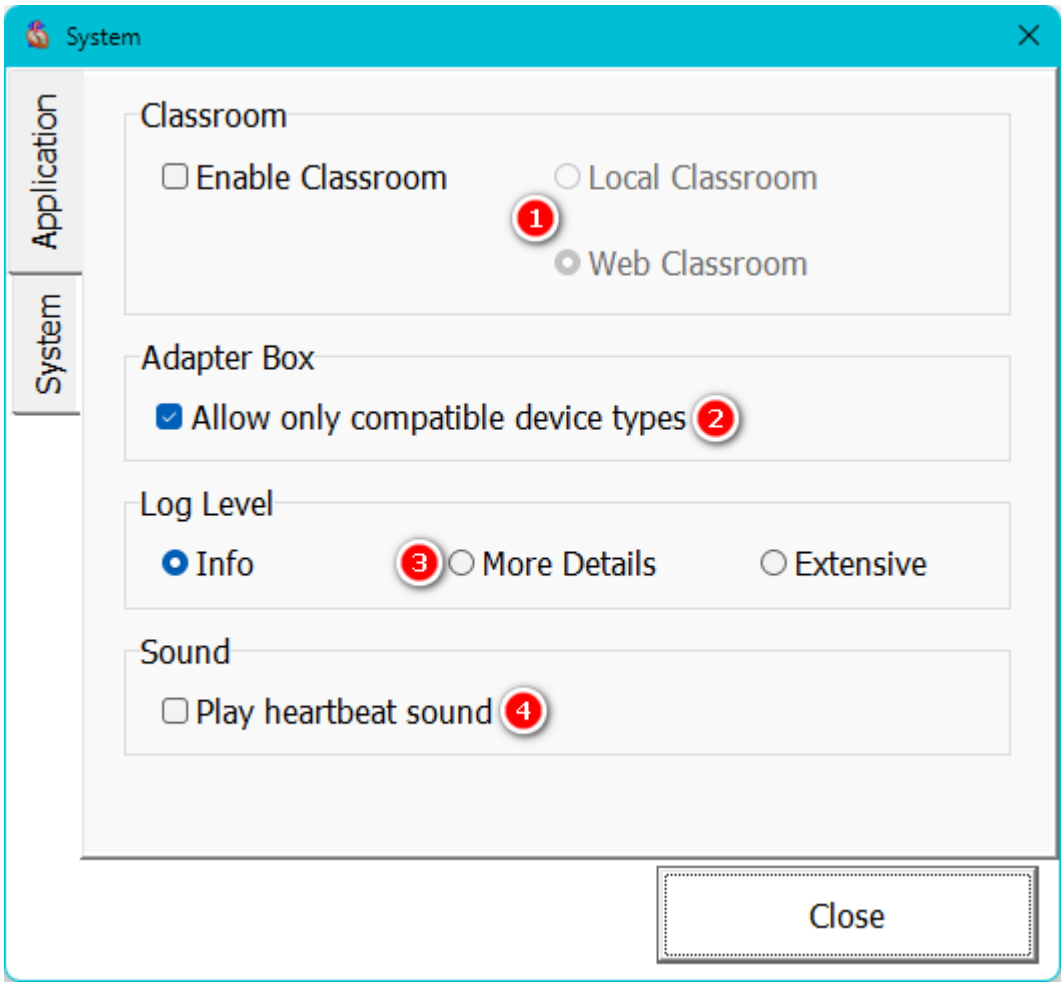
Filename Field
The filename is selected after opening the window. If you start typing immediately, the filename will be replaced by the new characters. To change only part of the filename, first touch the position you want to change.

OK
Press OK when the changes are complete.

Cancel
Press Cancel to cancel the changes.

System Dialog

Application



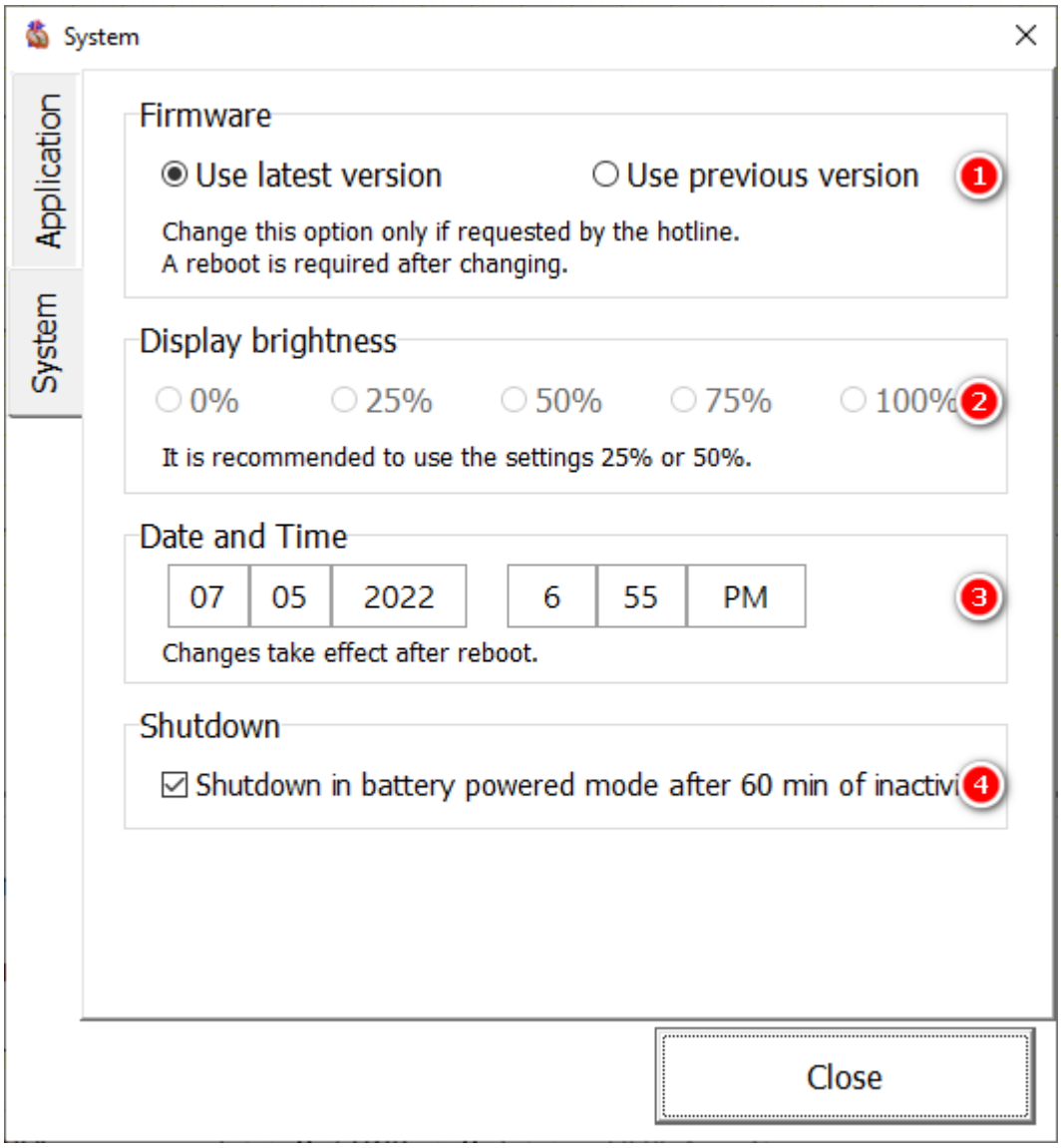
Classroom
InterSim can work in a classroom configuration. Check this box to enable the classroom functionality. Choose the Local or Web Classroom based on your existing configuration.

Adapter Box
Depending on the Adapter Box (Standard, Extended) and High Voltage Adapter (DF-1, DF-4) used, some functions may not be available. If you do not want this behavior, uncheck this box.

Log Level
It is possible to have more comprehensive information in the journal file. At startup, a message window indicates a higher log level.

Sound
Check this box to play available heartbeat sounds.

System



Firmware
The simulator stores up to two different firmware versions. Normally the latest version is loaded at simulator start-up. In case of problems, the hotline may ask you to load the previous version.

Display Brightness
The brightness of the display adjusts automatically to the surrounding light. Use this setting to adjust the basic brightness level. Use 75% or 100% only in combination with the docking station due to higher power consumption.

Date and Time
The correct date and time is necessary for evaluation of the log files. Please check and correct date and time

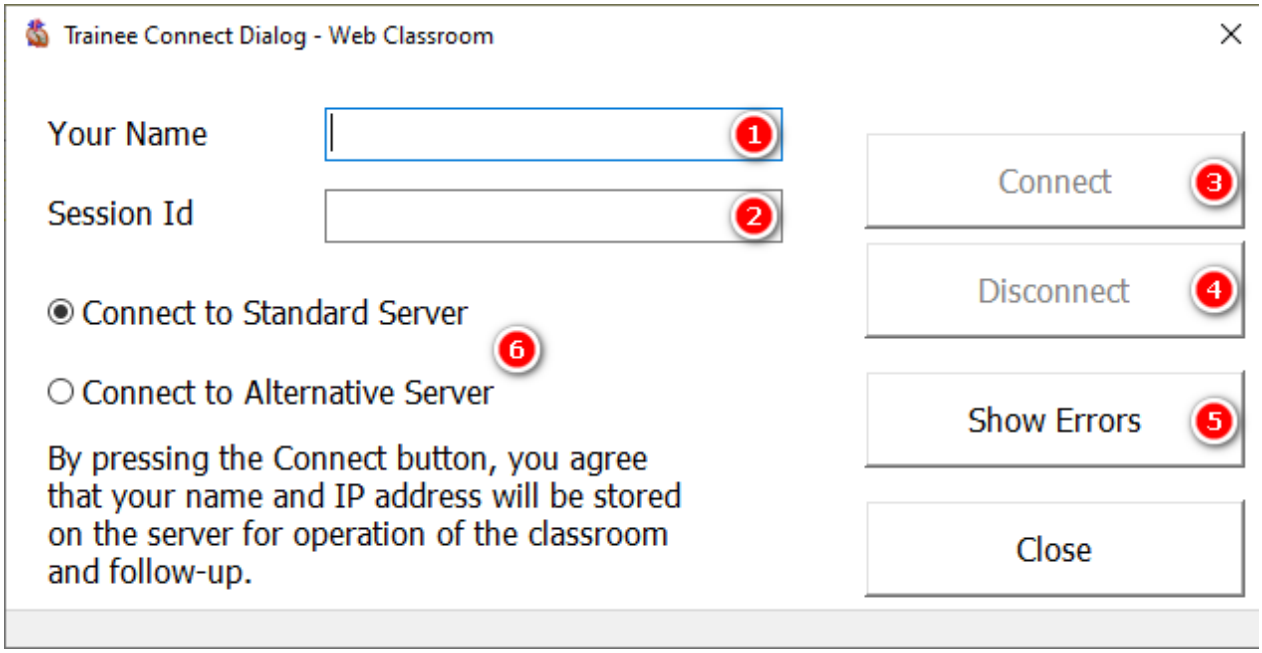
periodically.

Shutdown
The tablet will run on battery power for about 3 hours. If this box is checked, it will shut down after 60 min of inactivity. Learn more about Power Saving.

Web Classroom Connect Dialogs

The Web Classroom Connect Dialogs are opened by the corresponding File Menu items when the Web Classroom has been selected in the System Dialog Window.

Trainee Connect Dialog



Your Name
Each trainee must enter a name of their choice of at least 3 characters.

Session ID
The Session ID is a twelve-digit number and must be purchased (pay per use). The trainer and every trainee must use the same Session ID.

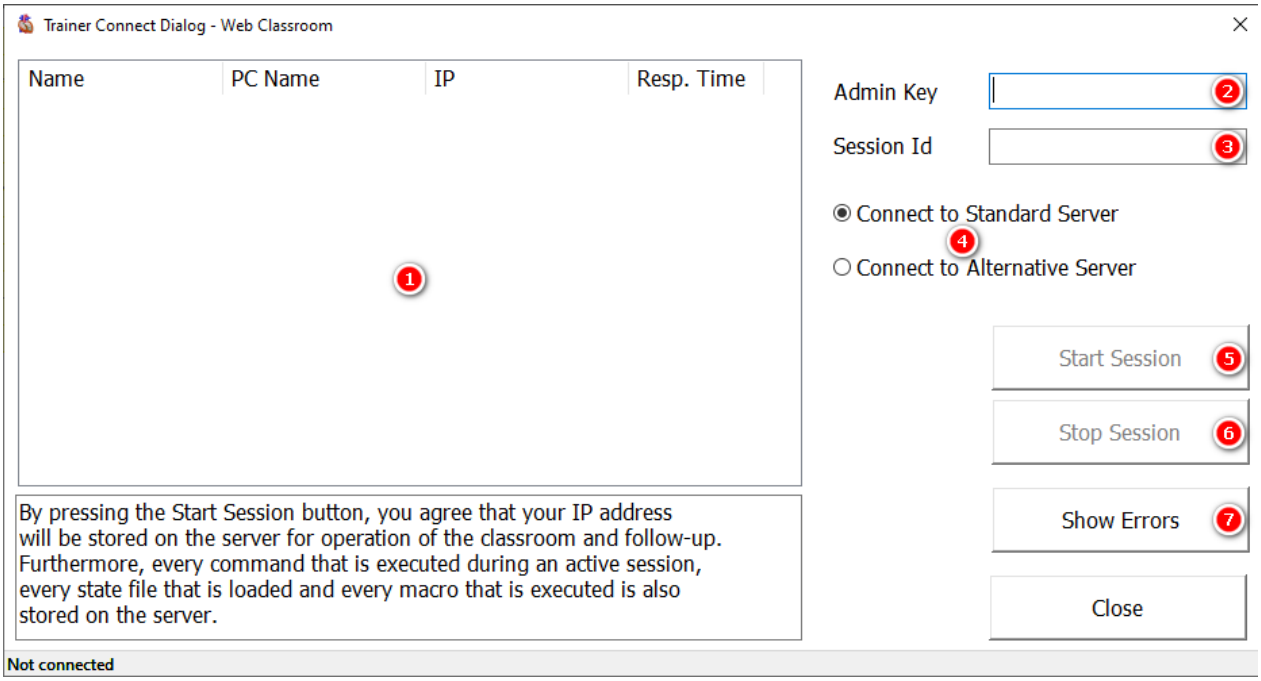
Connect
Press this button to connect to a Web Classroom.

Disconnect
Press this button to disconnect from a Web Classroom.

Show Errors
Show errors for troubleshooting purposes.

Connect to
The setting Standard Server should be used. Select Alternative Server only in case of a malfunction. The trainer and every trainee must use the same server.

Trainer Session Dialog



Connected Users
This table shows details of connected users:

- Name: the name used by the trainee.
- PC Name: This column is not filled when working in the Web Classroom.
- IP: the IP address assigned to the trainee's PC.
- Resp. Time: In Web Classroom mode, the response time can extend into the seconds range, depending on the user's location.

Admin Key
The Admin Key is a twelve-digit number and is supplied together with the Session ID (see below). **The trainer should not share the Admin Key, because you can start and end sessions with it.**

Session ID
The Session ID is a twelve-digit number and must be purchased (pay per use). The trainer and every trainee must use the same Session ID.

Connect To
The setting "Standard Server" should be used. Select "Alternative Server" only in case of a malfunction. The trainer and every trainee must use the same server.

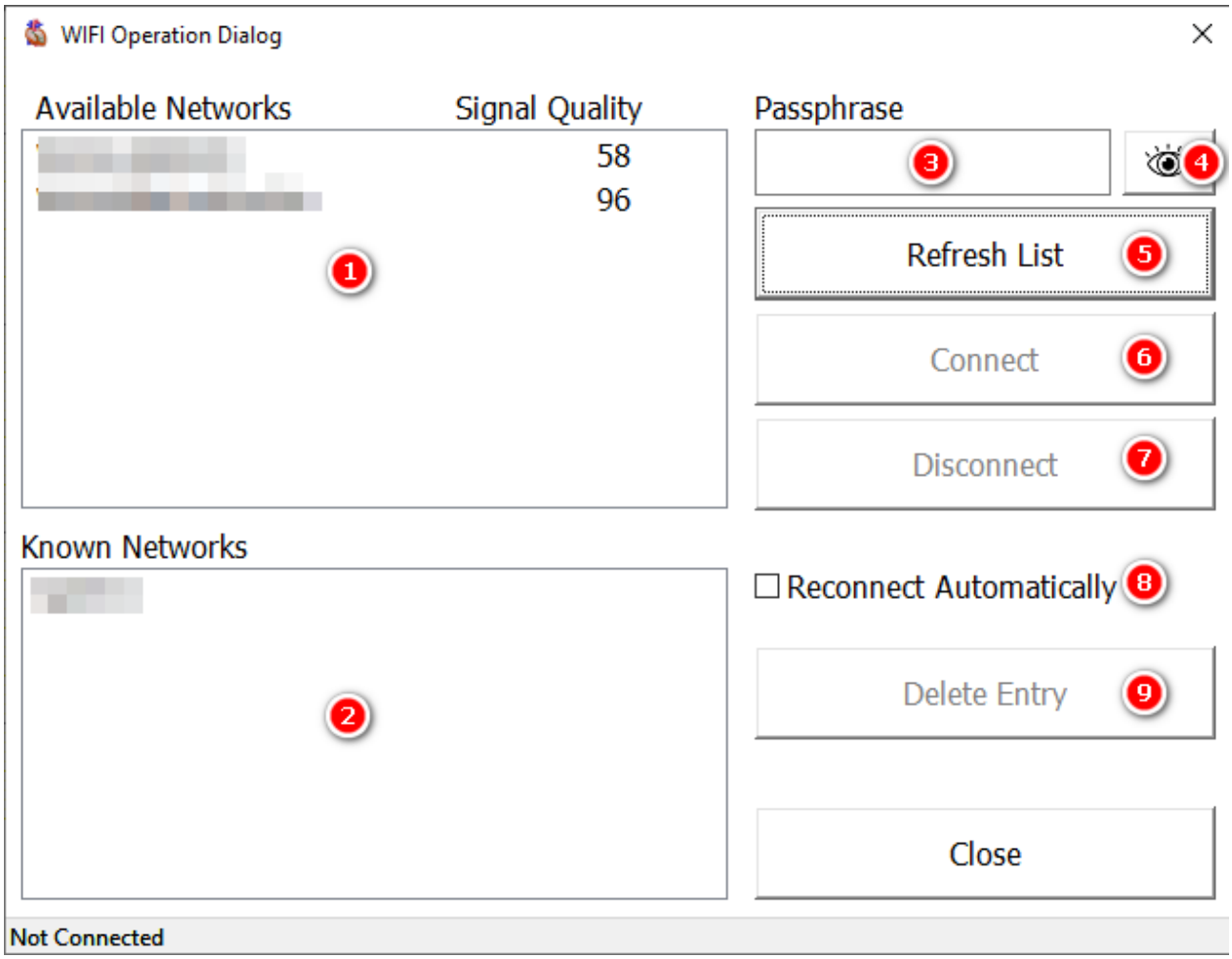
Start Session
Press this button to start a Session.

Stop Session
Press this button to stop a Session.

Show Errors
Show errors for troubleshooting purposes.

WIFI Dialog

The WIFI Dialog is available in the File Menu when the Web Classroom has been selected in the System Dialog Window. It is enabled when an external WIFI antenna is attached.



Available Networks
The list shows all WIFI networks that are available at the location. The networks can be rated by the signal quality, the best value is 100. Press the Refresh List button if you miss a network.

Known Networks
The list shows all WIFI networks from which the passphrase is stored and to which the device can connect automatically.

Passphrase
If you want to connect to an available network in the list, select this network and enter the passphrase.

Show Passphrase
This button allows you to view the passphrase while entering it.

Refresh List
Press this button to refresh the list of available networks.

Connect

When you have selected a network and entered the passphrase, press this button to connect.

 **Disconnect**
Press this button to disconnect from a connected network. The Reconnect Automatically checkbox will also be deselected.

 **Reconnect Automatically**
Select this checkbox to reconnect automatically to a known network. The device scans the networks in the background until a known network is found.

 **Delete Entry**
If you want to delete an entry in the known networks list, select this entry and press this button.

Miscellaneous

Antitachycardia pacing, Cardioversion and Defibrillation

Atrium

Basic Rhythm	Action	Result	Example Simulator Settings	Example Programmer Settings
Induction				
Any type	3 sec 50 Hz	Atrial Fibrillation	Sinus Rhythm	atrial 50 Hz ~3 s
Sinus Rhythm Sinus Brady Sinus Arrest	7 consecutive pulses in between 450 and 550 ms + 3 extras just outside the refractory	Atrial Flutter	Sinus Rhythm 68 bpm	S1 500 ms 7x S2 300 ms S3 300 ms S4 300 ms
Sinus Rhythm Sinus Brady Sinus Arrest	3 extras just outside the refractory	Sinus Tachy 120 bpm	Sinus Rhythm 68 bpm	S1 300 ms 3x
Sinus Tachy > 180 bpm	3 extras just outside the refractory	Atrial Fibrillation	Sinus Tachy 220 bpm	S1 250 ms 3x
Atrial Flutter	3 extras just outside the refractory	Atrial Fibrillation	Atrial Flutter 2:1 220 bpm	S1 200 ms 3x
ATP/Termination				
Atrial Fibrillation	1.5 sec 50 Hz	Sinus Rhythm	Atrial Fibrillation	atrial 50 Hz ~1.5 s
Sinus Tachy < 180 bpm	3 extras just outside the refractory	in accordance with "Chances for ATP": default 100% Termination	Sinus Tachy 120 bpm	S1 260 ms 3x
Atrial Flutter	5 pulses fall between 90 and 75%	Sinus Rhythm	Atrial Flutter 2:1 230 bpm	S1 230 ms 5x

Ventricle

Basic Rhythm	Action	Result	Example Simulator Settings	Example programmer Settings
Induction				
Any type	5 sec 50 Hz	in accordance with "Chances for Induction": default 100% Ventricular Fibrillation		ventricular 50 Hz ~3 s
Sinus Rhythm Sinus Brady Sinus Arrest	5 consecutive pulses in between 550 and 650 ms + 3 extras just outside the refractory	LVTachy 167 bpm	Sinus Rhythm 68 bpm PR 190 ms	S1 600 ms 5x S2 310 ms S3 310 ms S4 310 ms
Sinus Rhythm Sinus Brady Sinus Arrest	5 consecutive pulses in between 450 and 550 ms + 3 extras just outside the refractory	LVTachy 200 bpm	Sinus Rhythm 68 bpm PR 190 ms	S1 500 ms 5x S2 310 ms S3 310 ms S4 310 ms
Sinus Rhythm Sinus Brady Sinus Arrest	5 consecutive pulses in between 350 and 450 ms + 3 extras just outside the refractory	LVTachy 214 bpm	Sinus Rhythm 68 bpm PR 190 ms	S1 400 ms 5x S2 310 ms S3 310 ms S4 310 ms
Polymorphous VT, Torsade de Pointes (sometimes coupling is difficult) Ventricular Flutter (reliable)	4 pulses fall between 88 and 81%	Ventricular Fibrillation	Polymorphous VT	commanded ATP 84% 4 pulses minimum interval 160 ms
ATP / Termination				
Ventricular Fibrillation	2 sec 50 Hz	Sinus Rhythm		ventricular 50 Hz ~1.5 s
LV Tachy RV Tachy <182 bpm	4 pulses fall between 88 and 81%	in accordance with "Chances for ATP": default 100% Termination	LV Tachy 165 bpm "Respond to iATP" not checked	ATP 4 pulses 84%
LV Tachy RV Tachy >182 bpm	8 pulses fall between 93 and 83%	Sinus Rhythm	LV Tachy 220 bpm "Respond to iATP" not checked	ATP 8 pulses 88%
LV Tachy RV Tachy	as many S1 pulses as necessary to overcome the		LV Tachy 165 bpm "Respond to iATP" checked	iATP

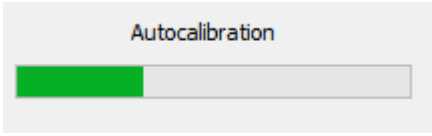
Basic Rhythm	Action	Result	Example Simulator Settings	Example programmer Settings
	distance to the tachy circuit at least one S2 pulse between 76 and 80%		Distance to VT circuit 100 ms	

Defibrillation

Basic Rhythm	Action	Result	Example Simulator Settings	Example Implant Settings
Any type except Ventricular Flutter, Ventricular Fibrillation	T wave energy between 0.5 - 5 J	in accordance with "Chances for Induction": default Ventricular Fibrillation	Sinus Rhythm 68 bpm	S1 400 ms * 8 S2 310 ms 1.1 J
LV Tachy RV Tachy Polymorphous VT Torsade de Pointes	QRS energy < 50% of ventricular threshold	no reaction	Simulator threshold Ventricle 30 J Polymorphous VT	Commanded Shock Sync 11 J
LV Tachy RV Tachy Polymorphous VT Torsade de Pointes	QRS energy between 50% and 100% of ventricular threshold	in accordance with "Chances for Induction": default Ventricular Fibrillation	Simulator threshold Ventricle 20 J LV Tachy 250 bpm	Commanded Shock Sync 17 J
LV Tachy RV Tachy Polymorphous VT Torsade de Pointes	QRS energy > 100% of ventricular threshold	termination of ventricular rhythm	Simulator threshold Ventricle 15 J Ventricular Flutter	Commanded Shock Sync 21 J
Any type	energy > 100% of ventricular threshold	termination of ventricular rhythm	Simulator threshold Ventricle 15 J Ventricular Flutter	Therapy 21 J
Any type except Sinus Tachy	energy > 100% of atrial threshold	termination of atrial rhythm	Simulator thresholds: Ventricle 15 J Atrium 8 J Dual Tachycardia: Atrial Fibrillation Ventricular Fibrillation	Therapy Shock 1 14 J Shock 2 21 J
Any type	8 V, 2 s direct current pulse through the high voltage electrode	in accordance with "Chances for Induction": default Ventricular Fibrillation	Sinus Rhythm	Pulse 8 V, 2 s

Auto Calibration

The auto calibration starts after each connection of the adapter box.



Calibration is used to minimize possible common mode voltages and maximize the accuracy of the pace pulse and shock measurement.

Block Characteristics

Block	Characteristic
1:1 Conduction	Sinus Rate 68 bpm Block Rate 171 bpm PR interval 170 ms
AV Block I	PR conduction time is prolonged to 250 ms.
AV Block II Mobitz II 2:1	Sinus Rate 78 bpm Block Rate 52 bpm PR interval 170 ms Every second atrial action is transferred to the ventricle.
AV Block II Mobitz II 3:1	Sinus Rate 78 bpm Block Rate 52 bpm PR interval 170 ms Every third atrial action is transferred to the ventricle.
AV Block II Mobitz II 4:1	Sinus Rate 78 bpm Block Rate 52 bpm PR interval 170 ms Every fourth atrial action is transferred to the ventricle.
AV Block II Mobitz I	Sinus Rate 68 bpm Block Rate 63 bpm With each atrial action the PR conduction time is prolonged, so that the ventricular rate value constantly corresponds to the lower "block rate". The PR conduction time is prolonged until a ventricle action fails.
AV Block III	The AV conduction is completely interrupted.
Retrograde Conduction	Retrograde P waves are initiated according to ventricle actions under the condition that the conduction system is not refractory.
Accessory Pathway	An accessory pathway between the atrium and the upper left ventricle is connected. As a result of this accessory pathway, PR interval is reduced, Q wave in the surface ECG is superimposed by so-called delta wave and the entire QRS complex is prolonged.
LBBB	A left bundle branch block is switched on.
RBBB	A right bundle branch block is switched on.

Chronotropic Incompetence

It is possible to show the chronotropic incompetence disease pattern and the related therapy by using a pacemaker with QT response .

- Insert a QT response capable pacemaker into the adapter box
- Choose the appropriate Device Type
- Reset the simulator by pressing the Reset button
- Open the simulation state 'ChronotropicIncompetence' or go to the Special Values menu, then the Exercise submenu, and change the Sinus Rate Max to 78 bpm
- Check the Box Auto Sinus & PR Interval
- Set the Workload to a value of 100% (or any other value but 0)
- Observe the change of the Exercise Level and the pacing rate of the pacemaker

Classroom Functionality

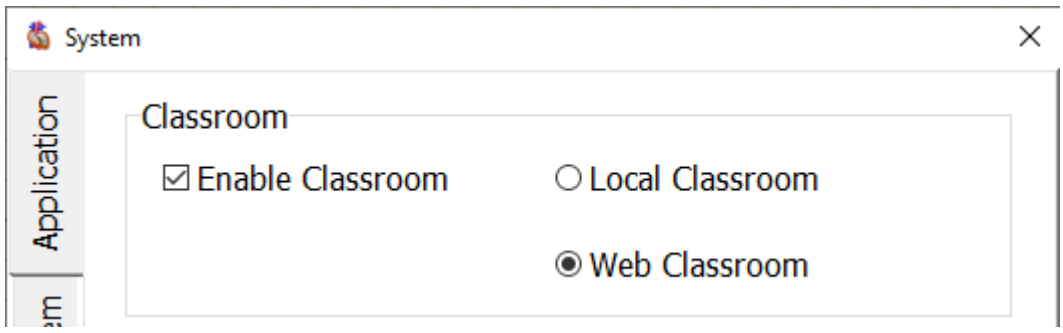
With the classroom version, InterSim III becomes the perfect companion in group training situations. Hook up as many as 20 InterSim III devices on a shared network or over the web. Use one trainer device to handle simulations on numerous simulators at the same time. The only requirement is an additional classroom package. In the case of the Local Classroom package, the integrated router spans a dedicated Ethernet or WIFI network. With the Web Classroom package, session IDs are included for immediate launch.

Regardless if you use InterSim III Interface, InterSim III Touch or multiple devices of both types combined – the classroom version gives you the freedom to combine them any way you want.

Use the Classroom as a Trainee

If you want to join a classroom session as a trainee, please follow these steps:

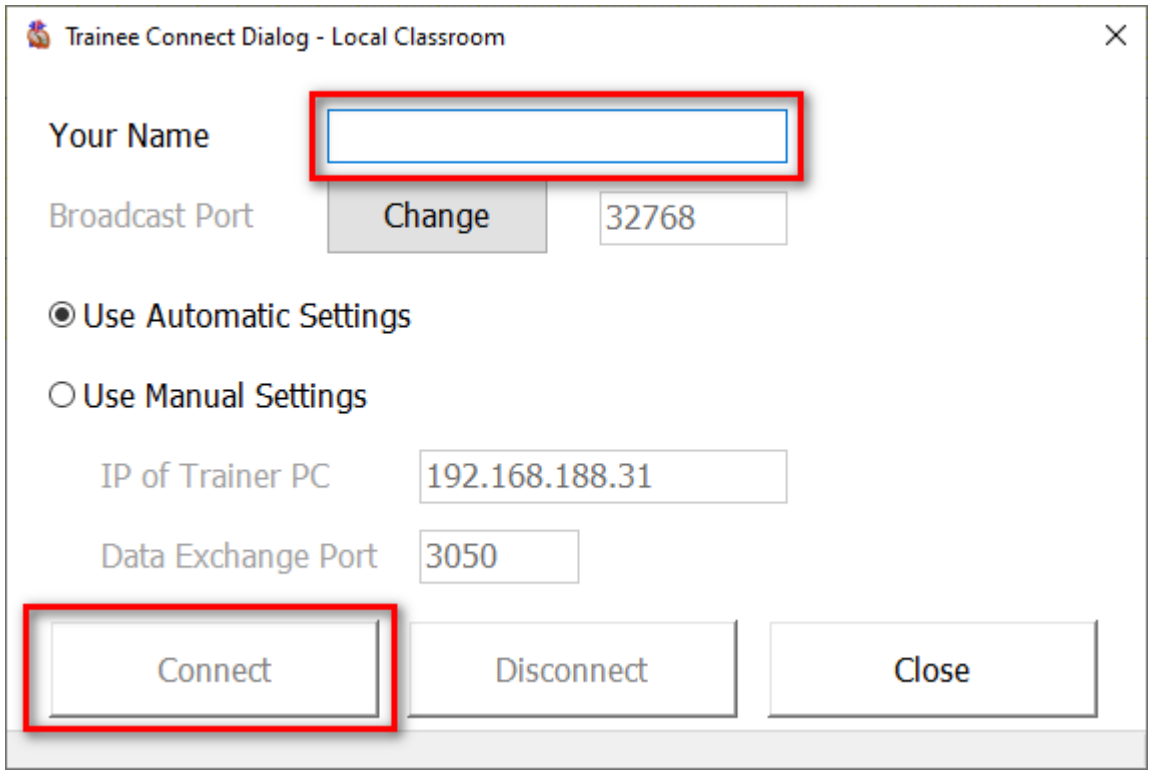
- If the Classroom menu is not available, please turn it on via the File menu, System menu entry.
  Select Local Classroom for a face-to-face training or Web Classroom if you are participating in an online training.



  The third colored field should light blue-gray after closing the dialog. The icon in the color field depends on whether you have selected via LAN or WIFI.

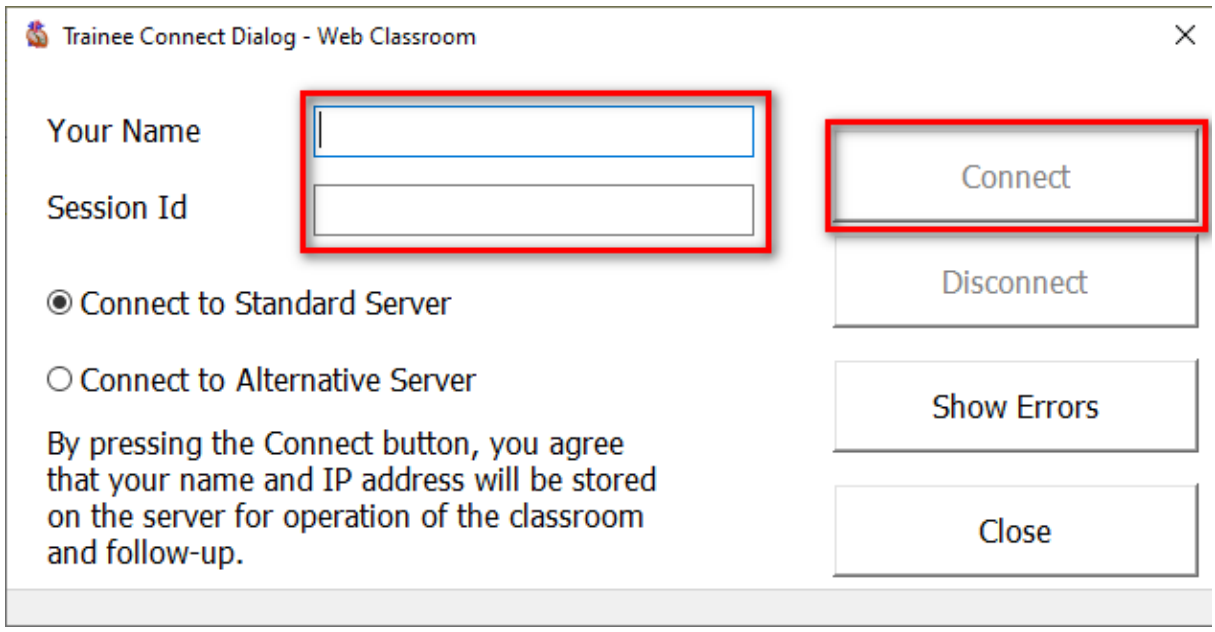
- When instructed by the trainer, select the File menu, Trainee Connect Dialog menu item.

  Connect as Trainee, Local Classroom:



Enter your name and press Connect.
When a connection is established, the dialog should close and the third colored field should light yellow.

Connect as Trainee, Web Classroom:



Enter your name and the Session ID provided by the trainer and press Connect.
When a connection is established, the dialog should close and the third colored field should light yellow.

- As soon as the trainer starts the session, the InterSim screen will change.
  The third colored field should light green.

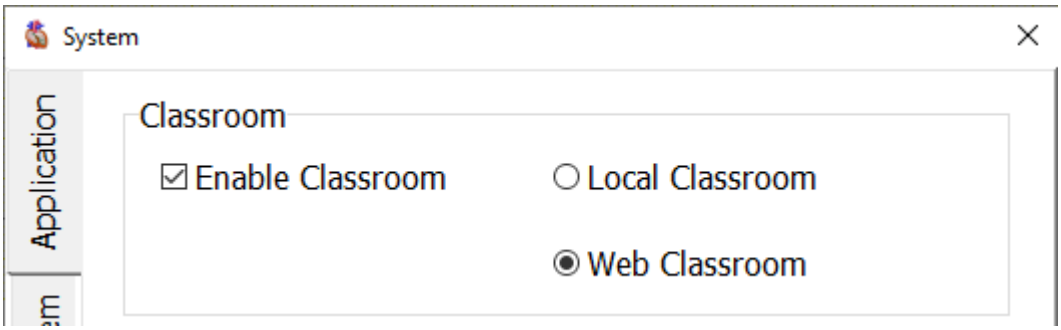
There are only a few menu entries left.

The Animated Heart, the Parameters group, the Prematures group, the Current States group, and the Exercise group are hidden.
The status bar shows only the entries Remote, the server used, and in case of the Web Classroom the Session ID.

Use the Classroom as a Trainer

If you want to start and lead a classroom session as a trainer, please follow these steps:

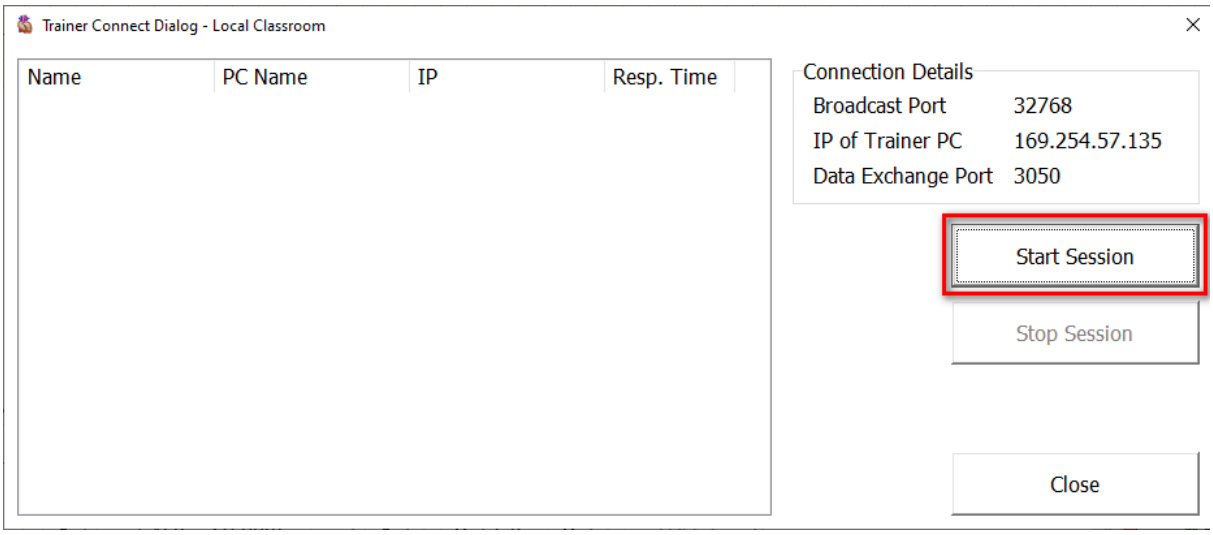
- If the Classroom menu is not available, please turn it on via the File menu, System menu entry.
  Select Local Classroom for a face-to-face training or Web Classroom if you are going to start an online training.



The third colored field should light blue-gray after closing the dialog. The icon in the color field depends on whether you have selected via LAN or WIFI.

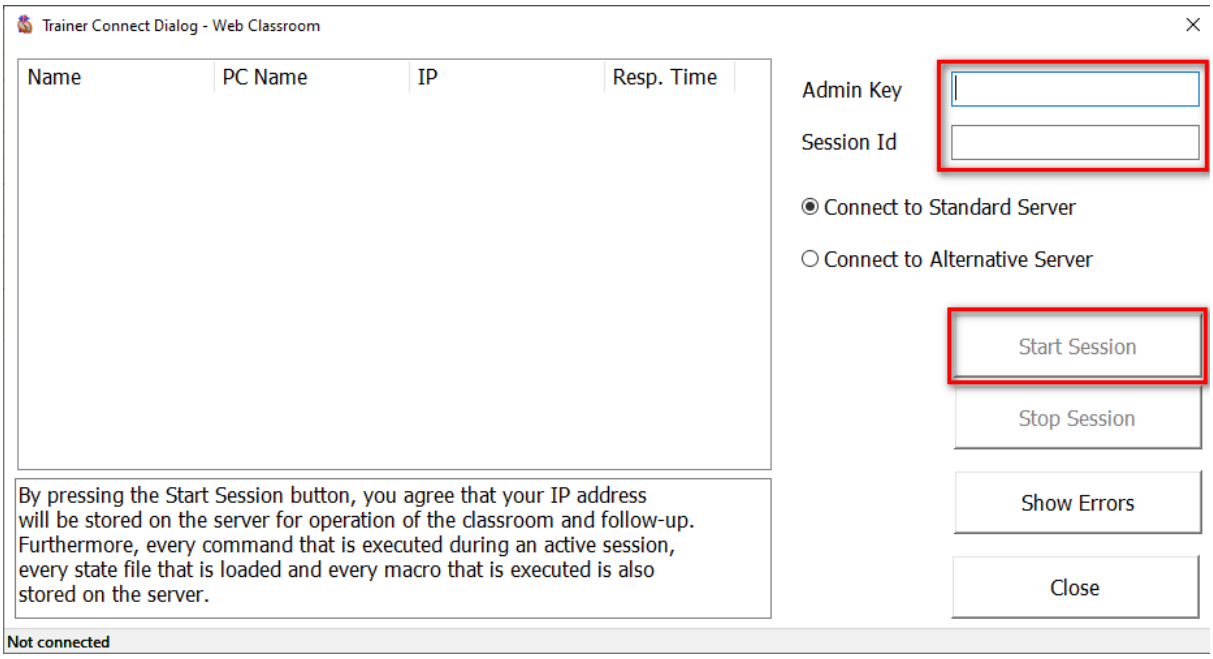
- When you are ready to start a session, select the File menu, Trainer Connect Dialog menu item.

  Start Session as Trainer, Local Classroom:
  Press the Start Session Button.



You can recognize the established connection by the third colored field, which should be green.

Start Session as Trainer, Web Classroom:
Enter the supplied twelve-digit Admin Key and the twelve-digit Session ID.



After pressing Start Session, the third colored field should light green.

If in very rare cases there are problems with the Standard Server, try the Alternative Server and vice versa. This setting must be communicated to and used by all trainees.

- Now you can make your simulator settings, load a State file or start a Macro. All actions are immediately transmitted to all connected trainees.

- If you want to see the data used or the currently connected Trainees go again to the File menu, Trainer Connect Dialog menu item. The PC name is filled only for the Local Classroom.

- Stop the session with the Stop Session Button.

Electrode Conditions

The simulator can simulate different electrode conditions:

Condition	Impedance per strand	Threshold	Amplitude	EMI
Normal	defined by the Impedance edit control	defined by the Threshold edit control (strength duration curve)	defined by the Amplitude edit control	defined by the EMI controls
Fracture	> 3000 Ω	no capture	0	small artifacts
Leakage	< 200 Ω	3.5 V or defined by the Threshold edit control, whichever value is greater	0	no
Scar	defined by the Impedance edit control	3.5 V or defined by the Threshold edit control, whichever value is greater	40% of Amplitude edit control	defined by the EMI controls

Heartbeat Sound

It is possible to play a heartbeat sound with every heartbeat.
The simulator looks for the following WAVE files in the folder 'Sounds':

- ASense.wav
- APace.wav
- LVSense.wav
- LVPace.wav
- RVSense.wav
- RVPace.wav
- Hiccup.wav

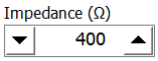
The simulator plays the sound if

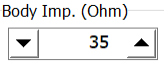
- the appropriate event occurs
- the corresponding file is available
- the checkbox Play Heartbeat Sound in the System Dialog is checked.

Impedances

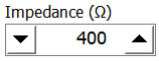
The resulting impedance of a pacemaker channel consists of different parts. Note that the measured impedance can differ from the expected value.

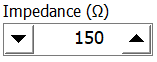
Unipolar impedance

If no defect is selected, the unipolar impedance is calculated by the strand impedance 

and the body impedance 

. With the values shown, the resulting unipolar impedance is 435 Ω.
With a selected defect, the impedance is mainly determined by the defect strand. The impedance is more than 3000 Ω with a Fracture condition.
The impedance is less than 200 Ω with a Leakage condition.

Bipolar impedance
If no defect is selected, the bipolar impedance is calculated by two strand impedances, for example the impedance of atrial Tip 

and atrial Ring 

. With the value shown, the resulting atrial bipolar impedance is 550 Ω.
With a selected fracture condition, the bipolar impedance is of more than 3000 Ω.
With a leakage condition in one strand, you should consider the impedance in the other strand. For example, if you have a leakage condition in the atrial Tip strand and an impedance of 200 Ω in the atrial Ring strand, the resulting bipolar impedance will be 250 Ω. You should select a leakage condition in both strands to get a true bipolar Leakage condition.

Look at the automatically calculated values of the resulting impedances for a quick overview.

Shock impedance ICD

The shock impedance is a combination of three impedances. The RV coil strand has an impedance of 20 Ω, the SVC coil strand 30 Ω, and the CAN strand 59 Ω. This results in the following resulting shock impedances dependent on the shock path:

Shock Path	Impedance
RV coil - CAN	79 Ω
RV coil - CAN||SVC coil	40 Ω
RV coil - SVC coil	50 Ω
RV coil||SVC coil - CAN	71 Ω

If the Fracture condition is selected for RV coil, the resulting shock impedance is a high-impedance state.
For sensing and pacing, the resulting impedance is the sum of the particular PM strand, the body impedance, the shock CAN strand, and the RV coil strand.

PMT

Use the following PM settings to induce a PMT:

- PVARP: 220-280 ms
- Paced AV delay: 80-180 ms
- Sensitivity A: 0.25mV ACG
- Maximum tracking rate: 130 bpm

Load the predefined state PMT.dat.
Start the PMT with a coupled premature ventricular contraction rPVC.

Reentry Loop

It is possible to demonstrate a reentry loop that includes the accessory pathway. First enable Accessory Pathway (Blocks menu), set PR interval to 235 ms (Parameters) and Coupling Interval to 350 ms (Parameters menu, Intervals submenu) and then trigger a PAC (Premature Contractions). The PAC cannot pass the accessory pathway because it is still in the refractory period, but can pass the AV node. The impulse then conducts retrograde up the accessory pathway to the atria and back down the AV node. The delta waves disappear during the tachycardia because the ventricles are activated through the regular AV pathway.

Reset

Parameter	Value after Reset
Rates	
Atrial Rate	68 bpm
AVN Rate	40 bpm
Ventricular Rate	28 bpm
Max. Variation (%)	0%
Intervals	
PR Interval	170 ms
RP Interval	280 ms
Block Rate	171 bpm
Coupling Interval	250 ms
Vulnerable Phase	60 ms
BBB QRS Width	160 ms
CS QRS interval	25 ms
Exercise	
Exercise	Off
Workload	0%
Sinus Rest Rate	68 bpm
Sinus Max Rate	136 bpm
PR Rest Interval	170 ms
PR Min Interval	115 ms
Chances for ATP	
Termination	100%
Acceleration 50 ms	0%
Acceleration 70 ms	0%
Degeneration	0%
New ATP response	Off
Chances for Induction	
Monomorphic Tachycardia 170 bpm	0%
Polymorphic Tachycardia	0%
Fibrillation	100%
No Response	0%
Miscellaneous	
A-Pace-P Latency	10 ms
V-Pace-Q Latency	10 ms
R Wave Variability with Respirational Cycle	7 %

ERAF	Off
ERVT	Off
Atrial Current of Injury	Off
Ventricular Current of Injury	Off
Conduction System Current of Injury	Off
EMI Frequency	no default value
A-Pace Crosstalk	
A-Pace Crosstalk	Off
A-Pace Crosstalk Latency	0 ms
A-Pace Crosstalk Width	80 ms
Farfield R Wave	
Farfield R Wave	Off
Intrinsic Farfield VA Interval	40 ms
Paced Farfield VA Interval	110 ms
Amplitude T Wave	
Amplitude T Wave	Normal
Affects also Surface ECGs	no default value
Rhythms	
Rhythm	Sinus Rhythm
Dual Tachycardia	Off
Blocks	
AV Block	1:1 Conduction
Retrograde Conduction	Off
Accessory Pathway	Off
LBBB	Off
RBBB	Off
PM Parameters	
Body Impedance	35 Ω
Atrial Amplitude	2.5 mV
Atrial Threshold Voltage	1.0 V
Atrial Threshold Current	10 mA
Atrial Threshold Pulse Width	0.4 ms
Atrial Tip Condition	Normal
Atrial Tip Impedance	400 Ω
Atrial Ring Condition	Normal
Atrial Ring Impedance	150 Ω
Atrial EMI	Off
Right Ventricular Amplitude	12.5 mV

Right Ventricular Threshold Voltage	1.0 V
Right Ventricular Threshold Current	10 mA
Right Ventricular Threshold Pulse Width	0.4 ms
Right Ventricular Tip Condition	Normal
Right Ventricular Tip Impedance	380 Ω
Right Ventricular Ring Condition	Normal
Right Ventricular Ring Impedance	150 Ω
Right Ventricular EMI	Off
Left Ventricle Setup	
Pacing Thresholds Pulse Width	0.4 ms
Condition Left Ventricular Tip1	Normal
Impedance Left Ventricular Tip1	400 Ω
RV-LV Interval Left Ventricular Tip1	no BBB 0 ms LBBB 100 ms RBBB 100 ms
Amplitude Left Ventricular Tip1	12.5 mV
EMI Left Ventricular Tip1	Off
Condition Left Ventricular Ring2	Normal
Impedance Left Ventricular Ring2	390 Ω
RV-LV Interval Left Ventricular Ring2	no BBB 5 ms LBBB 105 ms RBBB 95 ms
Amplitude Left Ventricular Ring2	12.5 mV
EMI Left Ventricular Ring2	Off
Condition Left Ventricular Ring3	Normal
Impedance Left Ventricular Ring3	440 Ω
RV-LV Interval Left Ventricular Ring3	no BBB 10 ms LBBB 110 ms RBBB 90 ms
Amplitude Left Ventricular Ring3	12.5 mV
EMI Left Ventricular Ring3	Off
Condition Left Ventricular Ring4	Normal
Impedance Left Ventricular Ring4	400 Ω
RV-LV Interval Left Ventricular Ring4	no BBB 15 ms LBBB 115 ms RBBB 85 ms
Amplitude Left Ventricular Ring4	12.5 mV
EMI Left Ventricular Ring4	Off
All Thresholds	1.0 V
All PNS Thresholds	n.c.
MPP reduces BBB QRS Width	Off

ICD Parameters	
Amplitude RV coil	2.9 mV
Impedance Condition	Normal
Post Shock Asystole	2 s
Threshold Atrium	8 J
Threshold Variation Atrium	Off
Threshold Ventricle	15 J
Threshold Variation Ventricle	Off
EMI RV Coil	Off

Rhythm Characteristics

Rhythm	Characteristic
Sinus Rhythm	Sinus rate 68 bpm
Sinus Brady	Sinus rate 39 bpm
Sinus Arrest	Sinus rate 0 bpm The ventricles follow an AV node escape rhythm.
Idioventr. Rhythm	Sinus rate 0 bpm AVN rate 0 bpm Ventricle rate 41 bpm Retrograde conduction on
Sinus Tachy	Sinus rate 120 bpm
Brady-Tachy Syndr.	The rhythm randomly alternates between Sinus Rhythm, Sinus Brady, Sinus Arrest, and Atrial Tachycardia.
Parox. Atrial Tachy	The rhythm randomly alternates between Sinus Rhythm and Atrial Tachycardia.
Atrial Flutter 2:1	Sinus rate 230 bpm Block rate 184 bpm
Atrial Flutter 3:1	Sinus rate 230 bpm Block rate 103 bpm
Atrial Flutter 4:1	Sinus rate 230 bpm Block rate 69 bpm
Atrial Fibrillation	Sinus rate randomly varies between 400 and 600 bpm. Use the AVN Block Rate to control the conduction to the ventricle.
Comb. Atrial Flutter/Fib.	The rhythm randomly alternates between Atrial Flutter and Atrial Fibrillation.
AVNRT	AVN rate 180 bpm
LV Tachy Slow 130 bpm	Left ventricle rate 130 bpm
LV Tachy Medium 165 bpm	Left ventricle rate 165 bpm
LV Tachy Fast 220 bpm	Left ventricle rate 220 bpm
LV Tachy Very Fast 250 bpm	Left ventricle rate 250 bpm
RV Tachy Slow 130 bpm	Right ventricle rate 130 bpm
RV Tachy Medium 165 bpm	Right ventricle rate 165 bpm

RV Tachy Fast 220 bpm	Right ventricle rate 220 bpm
RV Tachy Very Fast 250 bpm	Right ventricle rate 250 bpm
Polymorphous VT	Ventricle rate between 200 and 250 bpm
	The above ventricular tachycardias are not limited to the pre-selected rates. Use the Ventricular Rate parameter to change the rate of the tachycardia.
Torsade de Pointes Coarse and Fine	Ventricle rate 221 bpm Coarse and fine differ in the ECG
Ventricular Flutter	Ventricle rate 300 bpm
Ventricular Fibrillation Fine	Ventricle rate 214 and 250 bpm
Ventricular Fibrillation Coarse	Ventricle rate 250 and 300 bpm

Update

Updates will be provided in a file called 'Update Package'. Follow these steps to perform an update:

- Use a USB flash drive
- Create a folder called 'Updates' in the root directory of the USB drive
- Copy the provided Update Package File into the Updates folder
- Start the simulator
- When the simulator is running, open the cover on the right side of the tablet and plug in the USB drive
- After a short time, the File Dialog will appear
- The Updates folder in the right pane should show one contained file
- Select the Update Package File in the right pane
- Press the Import Selected Files button and wait until the file is copied
- Close the dialog
- Click OK when prompted to restart the simulator
- You can observe the update process when the InterSimIII.Start program runs
- When the simulator software is running again, verify the program version: Select the File menu, then About, then click on the Info tab

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