



LUNGSIM™

Mechanical Ventilator Simulator



Compatibility

The first mechanical ventilator simulator that can be connected to patient simulators.



User-Friendly Interface

Simple, fast and effective user interaction with the adult, pediatric and neonatal patient simulators.



Mobility

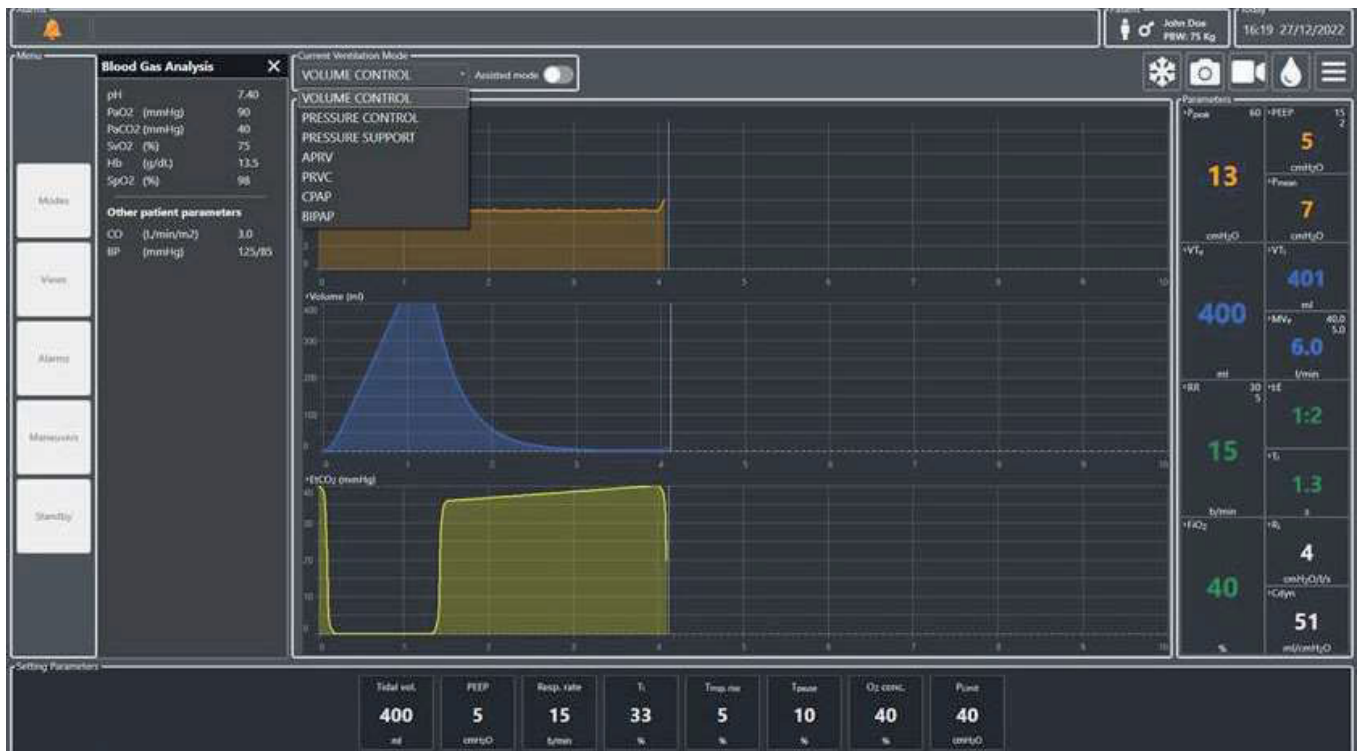
View the instructor interface on any device with an internet browser.

LUNGSIM™ is a unique and immersive mechanical ventilator simulator that is able to be interfaced **with your human patient simulator**. This **model driven** software allows the user to be self-trained on the respiratory mechanisms (**standalone mode**) as well as to create advanced simulation scenarios on different patients with pulmonary diseases or acute respiratory failures when wirelessly linked to an adult, pediatric or neonatal patient simulator (**sync mode**).

LUNGSIM™ incorporates real-time changes in vital signs,

ventilatory parameters and more. Users can be trained on define ventilator data, formulate diagnoses and make changes to best treat pathological patients. It allows instructors to simulate several patient conditions as for example chronic obstructive pulmonary diseases or acute respiratory distress syndromes simply changing patient parameters and ventilator values.

This software is composed by a realistic “learner interface” with integrated controls that simulate a real ventilator and a friendly browser based “instructor interface”



that can be used on PC, tablet, smartphone connected via local network to the learner interface and allows to use **LUNGSIM™** during advanced simulation scenarios. The user interface incorporates built-in validated layouts in order to simulate different ventilators and situations. It allows the learner to display loops and choose among several different ventilation modes:

- **Volume Control:** through this ventilation mode the user can define the tidal volume administered to the patient. The airway pressure results from the compliance of the lungs, airways resistances and the inhaled volume.
- **Pressure Control:** using this ventilation mode the user can define the inspiratory pressure which is administered to the patient's lungs.
- **Pressure Support:** using this assisted ventilation mode, that is patient-triggered (by pressure or airflow), the user can set the ventilator simulator to provide assistance when the patient makes a breathing effort. In this ventilation mode the trigger threshold represents a critical setting: an incorrect value of this parameter can produce the so called "missed triggering phenomenon".
- **APRV:** this ventilation mode is a form of CPAP which utilises releases of the high pressure level to a low pressure level intermittently and so it allows the administration of inverse ratio ventilation. In this modality, the patient has the freedom to make unassisted spontaneous breaths.
- **PRVC (Pressure Regulated Volume Control):** is a mode of mechanical ventilation that combines volume and pressure control ventilation. PRVC is an appropriate mode of ventilation for patients who require a specific tidal volume (VT) with the lowest effective pressure, such as those with acute respiratory distress syndrome (ARDS). In this mode, the ventilator delivers a volume-controlled breath. Using the plateau pressure from the previous delivered breath, the ventilator delivers the next breath. This allows the lowest delivery pressure, which is the target VT. In this manner, the PRVC mode may help prevent volutrauma and barotrauma.
- **CPAP (Continuous positive airway pressure):** it is a type of positive airway pressure ventilation that is used to deliver a set pressure to the airways that is maintained throughout the respiratory cycle, during both inspiration and expiration



• **BiPAP:** Bilevel positive airway pressure ventilation is a noninvasive technique used to provide ventilatory support to a spontaneously, but insufficiently, breathing patient using a facemask or nasal mask. With this mode of ventilation, BiPAP cycles between two levels of continuous positive airway pressure

The learner interface allows also the user to directly change the ventilation settings (as the Positive End-Expiratory Pressure, the Respiratory Rate or the Tidal Volume etc.) and to see on the virtual ventilator monitor several output parameters updating in real time (like Fraction of Inspired Oxygen, Insp : Esp Ratio, Expiratory Minute Volume, Inspiratory Minute Volume, Drive Pressure Value, etc.) and waveforms (like Pressure, Volume, Flow, Esophageal Pressure, Transpulmonary Pressure curves, EtCO₂ curve and all types of loops etc.). The user can also perform inspiratory/expiratory hold maneuvers as well as take screenshots of the ventilator screen, freeze the tracings and make measurements.

The instructor is able to change the value of the parameters like the Lung Compliance, Thorax Compliance, Resistances, Respiratory Muscle Effort etc, that describe the patient, set the esophageal pressure and generate a completely customized non-linear compliance. On the instructor interface new BGA (Blood Gas Analysis) parameters can be modified by the instructor and sent to the learner.

Through his interface, the instructor also have the possibility to save and load pathology presets – like the different steps of a COVID-19 typical scenario – or to simulate common complications that can typically occur during a

real ventilation scenario – like, for example, presence of water in the endotracheal tube, leaks in the tube or in the patient's lungs, presence of a mucus plug, or the presence of a bent tube. A set of pre-programmed and validated clinical cases is already present for COPD (Chronic obstructive pulmonary disease), Fibrosis, COVID-19, ARDS (Acute Respiratory Distress Syndrome) and Pneumonia.

LUNGSIM™ allows the user to train on the use of a mechanical ventilator without the need to have or buy a real mechanical ventilator.

LUNGSIM™ includes:

- LUNGSIM case including a USB stick with LUNGSIM software, lifetime license key and user manual
- Installation support and remote training
- Lifetime free software updates and upgrades

*Minimum System Requirements for the PC:
Display: 15" - Display Resolution: 1920 x 1080
CPU: Intel Core i-5 - RAM: 16 GB
Operating system: Windows 10 Pro (64 bit)
Language: English - SSD (Solid State Drive): 128 GB
Dedicated graphic card RAM: 2 GB*

LUNGSIM™ is a product from Accurate, a company blending international experience, scientific research, engineering and development of truly effective hi-tech educational solutions in the medical field.

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