QUAKELOGIC

QL-TYE9090

ADVANCED NURSING SIMULATION SYSTEM

QL-TYE9090

OVERVIEW

- QL-TYE9090 is a high-fidelity male patient simulator specifically designed for pre-hospital emergency care, critical and severe condition rescue, and nursing training for both military and civilian first responders.

- This cutting-edge simulator is versatile enough to offer an immersive and comprehensive simulation experience, meeting varying educational needs of users across various skill levels, from Basic Life Support (BLS) to Advanced Life Support (ALS), and Advanced Cardiac Life Support (ACLS), making it ideal for hospitals and emergency services for the training of emergency ambulance teams.

- Portable and durable, QL-TYE9090 is equipped with an extensive array of features that replicate real-life scenarios, making it highly effective for life-saving skills training. Its design allows trainees to engage with a realistic patient experience and face complex medical challenges that mirror those they may encounter in actual emergency situations.

- QL-TYE9090 serves as an invaluable resource for improving decision-making abilities, clinical knowledge, and hands-on skills essential for effective patient care under pressure. The simulator's ability to provide immediate feedback further enriches the learning experience, ensuring that trainees can identify areas for improvement and apply new strategies during subsequent training sessions.

- QL-TYE9090 represents a significant advancement in medical simulation technology, offering a dynamic platform that enables military and civilian first responders to refine their critical care and emergency response capabilities through realistic and challenging training exercises.

Standard Equipment

- Wireless and Tetherless Manikin
- Virtual Ventilator Add-in
- 26 Simulated Clinical Scenarios (SCSs)
- Simulation Cloud Platform
- Wireless Router
- Permanent License
- Hospital Gown
- 2 QL-TYE9090 Batteries
- QL-TYE9090 Charger Kit
- 1 Year Warranty
- User Manual
- 1 Simulated Sphygmomanometer
- 1 Simulated Thermometer Gun
- 1 Simulated Stethoscope
- 2 Simulated Suppositories
- 1 External Bleeding Tank (5L)
- Liquid Refill Kit
- Trauma Deluxe Moulage Kit (19 items)
- External Bleeding Module Kit (2 items)
- 26 Simulated Clinical Scenarios (SCSs)
- 2 Tracheotomy Modules
- 2 Pneumothorax Puncture Modules
- 2 Abdominal Paracentesis Modules
- 4 Tibia Puncture Modules
- 1 Deltoid Intramuscular Injection Module
- 2 Neck Skins
- 1 Set of ECG Patch
- 1 Microphone

26 Simulated Clinical Scenarios (SCSs)

Gas Station Explosion Caused Burns	Ventricular Fibrillation
Anaphylactic Shock	Tension Pneumothorax
Moderate Organophosphate Poisoning	Esophagogastric Variceal Bleeding
Intestinal Prolapse (Abdominal Trauma)	Fracture with Hemorrhagic Shock
Burns with Shock	Diabetic Ketoacidosis
Hypovolemic Shock (MVC	Stroke with Thrombolytic Therapy
Acute Exacerbation of Chronic Heart Failure	Acute Respiratory Distress Syndrome
COPD with Acute Exacerbation	Lung Cancer (Hydropneumothorax)
Septic Shock	Pneumothorax Secondary to Lung Cancer
Carbon Monoxide Poisoning	Interstitial Pneumonia
Status Epilepticus Secondary to Encephalitis	Ventricular Tachycardia
Heart Failure	Third-degree Atrioventricular Block
Cardiac Arrest	Severe COVID-19

Optional Equipment

Instructor PC	Simulated Patient Monitor
Intelligent Medicine Box	Simulated Syringe Pump
Simulated Infusion Pump	Simulated Blood Gas Analyzer
SimPiCCO	SimMonitor

Features

GENERAL

Wireless And Tetherless Design

- QL-TYE9090 is a high-fidelity, full-body male simulator with fully wireless and tetherless design and accurate anatomical proportions.

Multi-Position Placement with Detection:

- The simulator can be placed in a variety of positions, such as Trendelenburg, reverse Trendelenburg, Fowler's and lateral positions with automatic system detection.

Realistic Joint Articulation:

- The simulator has realistic and flexible joint articulation, including neck, bilateral shoulder, elbows, wrists, hips, knees and ankles.

Battery Operation:

- Fully operational on built-in battery power for up to 6 hours.

Tool-Free Limb Replacement:

- Limbs support quick tool-free replacement for easy maintenance and scenario setup.

AIRWAY

- **Lifelike Airway Anatomy & Oxygen Delivery:** Realistic airway with lifelike anatomical structures including oral and nasal cavities, tongue, teeth, palatoglossal arches, palatopharyngeal arches, tonsils, posterior pharyngeal wall, uvula, epiglottis, glottis, cricoid cartilage, thyroid cartilage, and trachea. Oxygen inhalation can be performed via nasal cannula and mask.

- **Comprehensive Airway Management & Intubation:** A wide range of airway management instruments and intubation techniques are supported, including orotracheal, nasotracheal, endobronchial, retrograde, fiberoptic intubation, and lightwand intubation, as well as transtracheal jet ventilation (TTJV). Nasopharyngeal airway (NPA), oropharyngeal airway (OPA), laryngeal mask airway (LMA), and other airway adjuncts & intubation aids also can be used.

AIRWAY

- **Airway Suction Procedures:** Oropharyngeal, nasopharyngeal, endotracheal, and tracheostomy suctioning can be performed by using clinical suction device.

- **Intubation Feedback & Detection:** After correct intubation, bilateral chest rise can be observed during ventilation. If the intubation tube is placed too deep and enters into one side of the main bronchi, it can lead to unilateral lung expansion with breathing sound. Correct tracheal intubation, excessive tracheal intubation, as well as esophageal intubation can be automatically detected.

- **Difficult Airway Simulation:** 4 types of critical difficult airway are supported, including laryngospasm, glossal edema, laryngeal edema, and pharyngeal obstruction. The glossal edema and laryngospasm allow for three-level severity adjustment to close the glottis, simulating "cannot intubate, cannot ventilate (CICV)" scenario of airway obstruction.

- **Airway Maneuver Detection:** Essential airway maneuvers are automatically detected, including head tilt–chin lift, head tilt–neck lift, chin-lift, and jaw-thrust techniques.

- **Cricothyrotomy & Tracheotomy Practice:** Replaceable neck skin allows for repeated practice of needle cricothyrotomy, surgical cricothyrotomy and tracheotomy

BREATHING

- **Realistic Spontaneous Breathing & Chest Movement:** Spontaneous breathing with realistic airflow through the mouth and nose can be simulated. Chest movement is synchronized with ventilation (spontaneous breathing or positive pressure ventilation). The chest excursion is proportional to the tidal volume and varies accordingly.

- **Adjustable Breathing Patterns:** Respiratory rate, rhythm and inspiratory-to-expiratory ratio (I:E ratio) are adjustable to simulate various breathing patterns, including eupnea, sighing breathing, Cheyne-Stokes breathing, Biot's breathing and tachypnea.

- **Comprehensive Breath Sound Auscultation:** A total of 14 auscultation sites located at anterior and posterior sides. Normal and multiple abnormal breath sounds can be set.

- **Tension Pneumothorax & Needle Decompression:** The simulator can simulate tension pneumothorax at varying severity levels. Needle decompression can be performed at the second intercostal space on the left/right midclavicular line. A rushing sound of exiting air from the needle can be heard upon successful puncture. The puncture operation can be detected and logged automatically, with 4 replaceable pneumothorax puncture modules.

- **Hydrothorax Simulation & Closed Thoracic Drainage:** Hydrothorax can be simulated, and closed thoracic drainage can be performed at the intersection of the left/right fifth intercostal space and the mid-axillary line. Operations such as chest tube insertion and the hydrothorax relief upon completion of drainage can be automatically detected and logged. Real fluid can be drained out.

CIRCULATION

- **Palpable Pulses:** Bilateral facial, carotid, brachial, radial, anterior tibial, femoral, posterior tibial, fibular, dorsalis pedis, pulses are synchronized with ECG and the pulse strength can be automatically adjusted according to the condition. 4 adjustable states of pulse intensity include strong, weak, absent, and normal. Pulse palpation can be detected and logged.

- **Vascular Bruit Auscultation:** Vascular bruits auscultation at five sites are supported, including the abdominal aorta, bilateral renal arteries, and bilateral iliac arteries.

- **Cardiac Auscultation:** Auscultation of normal and multiple abnormal heart sounds at 5 cardiac auscultatory areas (Aortic, Pulmonic, Erb's point, Tricuspid, Mitral) are supported.

- **Pericardiocentesis Procedure:** Pericardiocentesis can be performed under the xiphoid process with clearly defined landmarks, including costal arch and xiphoid process, allowing for the aspiration of simulated pericardial effusion. The puncture operation can be detected and logged automatically. The puncture module is designed for easy replacement.

- **Manubrial Puncture Procedure:** The surface landmarks including manubrium sterni, sternal angle, and body of the sternum are palpable, allowing for manubrial puncture. The puncture operation can be detected and logged automatically. The puncture module is designed for easy replacement.

- **Real Monitor Compatibility:** 5 electrode connection sites support the connection with real patient monitor for real-time ECG and vital signs monitoring. ECG Simulation: Dynamic 12-lead ECG can be generated on the simulated patient monitor and ECGplayback is supported for review.

- **Real Blood Pressure Measurement:** Real sphygmomanometers and BP cuff can be used. The correct placement of the cuff can be detected.

- **SpO_2 Monitoring:** SpO_2 monitoring is supported by using real pulse oximeter, with a measurement error of no more than 2%.

- **Lip Color Changes:** Lip color can be controlled by system to display four states, including cyanosis, pale, ruddy and normal.

CPR &CARDIAC

- **Real-time Ventilation Feedback:** Artificial ventilation such as mouth-to-mouth and bag-valve-mask is supported, leading to visible chest rise. Ventilation volume can be detected and logged.

CPR &CARDIAC

- **Real-time CPR Feedback:** Real-time monitoring 15 performance data of CPR, including: compression count, hand position, compression depth, compression frequency, airway opening, ventilation count, ventilation duration, real-time tidal volume, total CPR duration, chest compression fraction (CCF), interruption count, interruption duration, effective compression/ventilation ratio, and cycle count. The data such as hand placement, compression depth, compression frequency, ventilation duration, and real-time tidal volume can be observed in two forms: virtual animation and curves.

- **Real-Time CPR Physiological Feedback:** High-quality chest compression can trigger palpable carotid pulse, and generate corresponding ECG waveforms and pulse waves.

- **Guideline Compliance:** Compliant with AHA and ERC guidelines.

- **Customizable Criteria:** User-defined CPR evaluation criteria, CPR success criteria, defibrillation success criteria are supported.

- **Defibrillation and AED Training:** Real defibrillator, AEDs and simulated defibrillator DefibReady (optional) can be used with the simulator. The system will display the defibrillation energy level and times, allowing for displaying whether pad or paddle placement is correct. The energy value can be detected accurately from 1-360J.

NEUROLOGICAL

- **Ophthalmic Pathology Simulation:** A range of pathological ocular signs can be simulated, including scleral icterus, cataract, conjunctival hemorrhage, conjunctival injection and conjunctival chemosis. Pathology for each eye can be set independently.

- **Pupillary Light Reflex Simulation:** Pupillary light reflex examination is available. The pupil size can be automatically adjusted in response to light stimulus or can be manually pre-set via software. Pupillary state and size can be set independently for each eye, allowing for simulating normal consensual and pathological non-consensual light responses. The pupil diameter is adjustable from 1 to 9 mm,andthe pupillary light reflex can be set as brisk, sluggish, or absent.

- **Eyelid States and Blinking Simulation:** 3 eyelid states can be set: closed, ptotic and open. Automatic blinking can be set with 6 frequencies: very fast, fast, moderate, slow, very slow and incredibly slow. Eyelid states and blinking frequency for each eye can be set independently.

- **Convulsions Simulation**

- **Knee-Jerk Reflex Simulation:** Knee-jerk reflex testing is supported. A tap by percussion hammer on the patellar tendon will trigger a sudden kicking motion of the lower leg, with 4 states of knee-jerk reflex: normal, hypoactive, absent and hyperactive

NEUROLOGICAL

- **Babinski Sign Testing:** Bilateral Babinski sign testing is supported. Stroking lateral plantar surface of the foot from the heel toward the toes and across the metatarsal pads to the base of the great toe, the simulator can automatically exhibit dorsiflexion of the great toe with fanning of the other toes (positive Babinski sign) or the all toes flection (negative Babinski sign). Correct technique can be detected automatically.

- **Oppenheim Sign Testing:** Bilateral Oppenheim sign testing is supported. Stroking along the medial surface of the tibia, the simulator can automatically exhibit dorsiflexion of the great toe with fanning of the other toes (positive Oppenheim sign) or the all toes flection (negative Oppenheim sign). Correct technique can be detected automatically.

SOUNDS & SPEECH

- The simulator is equipped with built-in stereo sound units for playing pre-recorded sounds and speech, with a built-in library of 937 audio samples, allowing for uploading custom audio files for scenario-specific training. Instructors are able to simulate patient interactions with trainees via a wireless microphone, with the voice emitted through the simulator.

VASCULAR ACCESS

- **Intramuscular (IM) Injection Sites:** Intramuscular injections can be performed in the bilateral deltoid, vastus lateralis, and gluteus maximus muscles.

- **Tibial Intraosseous (IO) Access:** Tibial intraosseous (IO) is supported. logged.

- **Peripheral Intravenous (IV) Access & Infusion:** Bilateral intravenous (IV) access is available. Venipuncture can be performed on the dorsum of hands and forearms. After applying a tourniquet, the veins become visibly engorged. The blood flashback can be observed after successful puncture, allowing for smooth fluid infusion after opening the infusion set clamp. Venipuncture for blood collection and closed intravenous infusion are supported. The venous indwelling needle can be inserted into the cephalic vein at right wrist, with real fluid infusion.

- **Radial Artery Puncture:** Radial artery puncture can be performed.

- **Central Venous Access (CVC):** Deep venous puncture is supported at the subclavian vein and internal jugular vein sites, allowing for real liquid infusion.

- **Internal Jugular Vein Access (Left):** Central venous access at the left side of the neck supports real fluid infusion.

- **All the puncture modules are designed for easy replacement.**

SECRETIONS

- Forehead diaphoresis, foaming at the mouth, fluid discharging from ear canals, nostril and tearing can be controlled by software with adjustable speed (fast, medium and slow). It also can simulate critical pathologies such as bloody tears, bloody sweat and nasal discharge of bloody cerebrospinal fluid (CSF), with visible real red fluid outflow.

TRAUMA

- This simulator provides comprehensive training for hemorrhage control. Realistic, site-specific traumatic wounds can be simulated using interchangeable trauma moulages, allowing practice of hemostasis via direct pressure and tourniquet application. It features a dedicated inguinal (groin) hemorrhage module with an adjustable bleeding rate (fast/medium/slow) for wound packing training. Bleeding automatically ceases upon correct procedural execution, providing immediate feedback.

GASTROINTESTINAL

- **Bowel Auscultation:** Bowel sounds can be auscultated in all four quadrants and the around the periumbilical area.

- **Gastric Distension & Decompression:** Gastric distension caused by inadvertent esophageal ventilation can be simulated, with visible stomach bulge. The gastric area returns to normal state by gastrointestinal decompression

OTHER FEATURES

- **Urinary Catheterization Training:** Urinary catheterization and indwelling catheterization are supported, with easily interchangeable male and female genital modules. The urine flow speed is adjustable (fast, medium, or slow). The urine output can be automatically regulated according to changes in the simulated patient's condition. Hematuria can be simulated, with visible real red fluid outflowing from the urethra.

- **1)** Male genital module: The penis is in a natural, pendulous state, with a pliable foreskin structure partially covering the glans. The foreskin can be manually retracted to fully expose the urethral meatus and coronal sulcus. The penis can be elevated to 60-degree angle from the abdominal wall to facilitate smooth catheter insertion. The narrowing and curvature of the urethra can be simulated, providing authentic tactile feedback.

- **2)** Female genital module: The labia minora can be separated to expose the clitoris, with the urethral meatus and vaginal introitus clearly visible.

OTHER FEATURES

- **Ascites Simulation and Abdominal Procedures:** Simulation of ascites supports detection of positive shifting dullness via abdominal percussion. Abdominal paracentesis and diagnostic peritoneal lavage (DPL) can be performed in the left lower quadrant with a sense of breakthrough "pop" during the puncture procedure. Up to 1L real fluid can be withdrawn, ensuring true-to-life procedural training.

- **Dynamic Fluid Balance Monitoring:** The fluid intake and output can be monitored to assess the fluid balance state.

Drug Recognition System

PK/PD Modeling for Automated Drug Response

The system contains pharmacokinetics and pharmacodynamic (PK-PD) modeling for 87 drugs to ensure that simulator's physiological responses to drugs are automatic, dose-dependent and real time, without the need for manual setup.

Real-Time Drug Monitoring & Multi Drug Display

The drug monitor displays the current plasma concentration and drug metabolism curve in real time for each marked drug and can simultaneously display plasma concentrations and drug metabolism curves of multiple drugs.

Intelligent Medication Management & Recognition

An intelligent medicine box (optional) supports instructor to input medication information by editing the drug name, dosage and mode of administration. The simulator's arm has a specific drug recognition area to facilitate simulated drug administration.

Software Control System

- QL-TYE9090 features an embedded software system with a built-in Web Server. Any Wi-Fi-enabled smart device can directly access the control interface through a standard web browser without installing any software. The system allows an instructor station to simultaneously operate and monitor multiple simulators on the same local area network in real time.

- The software interface is designed with a responsive layout, adapting automatically to displays on mainstream PCs & tablets.

- A large number of graphical buttons and interactive effects are applied in the settings for conditions, interventions and physiological parameters to enhance usability.

- The control software has built-in 2D scenes, which can display the current status of simulator in real time, encompassing 20 items including eye manifestations, sweating at forehead, lip color, shivering, convulsions, mouth foaming, knee-jerk reflex, voice, pulse strength, pulse palpation, closed pneumothorax, tension pneumothorax, hydrothorax, glossal edema, laryngospasm, tracheal intubation, auscultation condition, gastric distension, gastric hemorrhage, and traumatic hemorrhage. The corresponding physiological parameter settings can be quickly accessed by clicking on the relevant positions.

- The control software has built-in 3D animation scene, including virtual pre-hospital scenes, emergency vehicles, emergency room, intensive care unit, supporting the adjustment of the observer's viewpoint and zoom level. One-click screen projection for 3D scene is available.

- 20 states or interventions such as foaming at the mouth, tears, sweating, lip color, fluid discharge from ears & nostril, convulsions, shivering, burns, fractures, prolapse intestine, blood pressure measurement, pulse palpation, pupillary light reflex, tracheal intubation, auscultation, chest compressions, gastrointestinal decompression, tibial puncture, needle decompression for pneumothorax, and closed thoracic drainage, can be synchronized and visualized in the 3D scene.

- When performing reflex tests such as Knee-jerk reflex, Babinski sign, and Oppenheim sign on the simulator, the control software automatically triggers the synchronous display of 3D animations demonstrating the corresponding pathological responses.

- Real-time 3D animation of CPR operation is supported, synchronized with actual CPR performance data. Through performing operations including chest compressions, ventilation, and endotracheal intubation on the simulator, the system demonstrates dynamic animations under varying conditions, including circulatory changes, cardiac contractions, pulmonary expansion, and intubation. The system monitors and displays 7 parameters in real-time, including depth of Real-time Compression, Target Compression and Maximum Compression, Real-time Tidal, Blood Oxygen, Cardiac Blood Volume, and Cerebral blood Volume

Software Control System

- The system offers three operating modes: Patient Mode, Guided Manual Mode and Scenario Mode to meet specific training and instructional objectives. All the modes support to turn on/off physiological drive. In Case Mode, the system includes 26 built-in simulated clinical scenarios (SCSs).

- Time tag can be added at any point during the simulation process. Clicking on a time marker quickly loads the patient's physiological parameters to the targeted time point.

- The system supports ECG editing, allowing direct manipulation of waveform morphology via drag-and-drop on the ECG graph, with real-time preview capability after editing completion.

- The system includes templates for laboratory test sheets and imaging reports, including 316 X-ray images. Instructors can upload custom DICOM format images. It also supports editing of laboratory data and automatically generates the corresponding examination reports, which can be forwarded to the patient monitor.

- Adjustable case operating speed, can be accelerated, decelerated, paused, stopped and reset at any time. Physiological parameters support 7 trend time settings (including real-time, 10s, 20s, 30s, 1min, 2min, 5min) and 4 conversion curve settings.

- Preset evaluation forms (including checklist, Mini-CEX, DOPs) allow for the assessment of trainee performance and support instructor customization for editing the forms.

- The system automatically records the operation logs in real time, which can be filtered and displayed by categories including case, parameter/condition, medicine/intervention, examination/voice, and evaluation form. Instructor can add quick performance comments and remarks. Users can revisit or playback log details.

- The system has trend check function, which can display trend curves of monitored parameters from 10 minutes before to 10 minutes after the current time, and dynamically updates the curves in response to changes of patient’s conditions and interventions.

- **ETCO2:** The system can display no less than 19 waveform types, including normal respiration, hyperventilation, hypoventilation, sudden increase, sudden decrease, absent alveolar plateau, waveform disappearance, gradual recovery of spontaneous breathing, exponential decline, persistent low concentration, curare-cleft spontaneous breathing, cardiogenic oscillations, camel sign, glacier-like waveform, esophageal intubation due to misplacement, elevated baseline, respiratory opposition, inspiratory unidirectional valve insufficiency, and sample line leak during positive pressure ventilation. It also supports custom configuration of Phase 0, Phase I, Phase II, Phase III, Phase IV, and Phase III slope.

Software Control System

- Instructor can customize their own course cases through the Simulation Course Platform, enabling unlimited case expansion of the case library.

1) Comprehensive Course Content Management The editable course information covers all implementation phases of simulation-based courses: pre-class preparation (basic information, course overview, learning objectives, instructional objectives, and developers), preparation (scenario setup and item list), course execution (patient information, patient case, course process, and expected interventions), trainee behavior assessment (evaluation form), and review (review key points).

2) AutomaticCase Framework Matching Selecting a product in the Basic Information module automatically loads its matching case framework into the Patient Case editor. This enables instructors to quickly customize case for diverse teaching and training objectives.

3) CourseManagementandSystem Connectivity Creating, editing, and publishing of courses are supported, allowing for sharing courses within the organization. The platform supports seamless integration with the software control system, enabling both manual import and cloud synchronization of cases.

4) Multi-Scenario Configuration and Dynamic Case Preview The platform enables flexible configuration of multiple scenarios and state-based editing of case workflows, with automatic generation of case flow diagrams within the platform. It also supports built-in physiological drive to allow dynamic online case preview.

Simulated Patient Monitor

- The touchscreen patient monitor wirelessly connects to the simulator, displaying various real-time waveforms and parameters. It simulates the functions of physical probes and sensors, generating corresponding waveforms and vital signs upon connection. Users can adjust waveform amplitude and speed, with the consistent operation of a real clinical bedside monitor.

- **Case information:** Allows users to view the details of the currently active case.

- **Alarm:** Turns the alarm sound on/off with a single click.

- **Freeze:** Freezes the currently displayed waveform(s) without interrupting the ongoing simulation scenario.

- **Monitor settings:** The system allows configuration of layouts and alarm parameters. It includes built-in layouts such as 3-waveform, 4-waveform, 5-waveform, 12-lead, ICU, Anesthesia, and Large Font Mode. Users can select and save the current layout according to their needs. Alarm parameter settings enable customization of the alarm ranges for parameters like HR, NIBP, SpO2, IBP, ETCO2, RR, NIBP, Temp, ICP, PAP, CVP, PAWP, PCWP, BIS, supporting adjustment of the display position and color of these parameters.

- **Medical reports:** Students can view the lab tests and image reports sent by the instructor station.

- **Manual NIBP:** Allows for manual NIBP measurement or can be configured to perform automatic measurements at set intervals.

- **Monitoring of physiological indicators includes:** HR, PR, RR, ABP, MAP, PAP, CVP, ICP, C.O., SpO2, ETCO2, PCWP, PAWP, Temp, IBP, BIS and TOF.

- The system is capable of displaying waveforms such as ECG, CO_2, RR (Resp), SpO_2 (Pleth), IBP, and ICP.

- **SPO2:** The system automatically adjusts the pulse tone played by the monitor based on the SPO2 value and supports pulse volume settings.

Virtual Ventilator:

- In physiological drive mode, students can use a built-in virtual ventilator featuring the same parameter settings and waveform display interface as those of a real clinical ventilator.

1) 2Non-invasive ventilation modes: CPAP, PSV-S/T 9 Invasive ventilation modes: PCV, VCV, P-A/C, V-A/C, P-SIMV, V-SIMV, P-SIMV+PS, V-SIMV+PS, PSV
2) Each ventilation mode has specific adjustable parameters, including ventilation frequency, inspiratory-to-expiratory ratio (I:E ratio), peak airway pressure, tidal volume, flow trigger sensitivity(F-Trig), positive end-expiratory pressure (PEEP), fraction of inspired oxygen (FiO2), flow, pressure support(Ps), inspiratory time (Ti), peak inspiratory pressure (PIP), SIMV frequency (f-SIMV), expiration (Exp), inspiratory positive airway pressure (IPAP), EPAP frequency (f-EPAP). Adjusting the parameters can automatically cause changes in vital signs.
3) The non-invasive ventilation mode supports the setting of mask leakage level, and the mask can be set at 3 levels of leakage in accordance with the real clinical mask leakage level.
4) The virtual ventilator interface displays 3 real-time waveform curves (P-T, F-T, V-T) and 3 dynamic loops (F-V, Paw-V, Paw-F). Without the need for manual pre-setting or intervention, the waveforms adjust automatically in real time based on the simulated patient's condition and the parameters set.
5) The system triggers alarms when multiple monitored parameters exceed their preset ranges, with the corresponding parameter values flashing in red as part of the alert.
6) The interaction between the ventilator and patient case can be simulated to generate changes in respiratory monitoring data that allows for the synchronization of mechanical ventilation with patients' spontaneous breathing in modes such as PSV, V-SIMV+PS, PSV-S/T. Patient–ventilator dyssynchrony waveforms is also available in modes like VCV, PCV, P-A/C, V-A/C

Virtual Defibrillator Monitor:

- It is displayed on the simulated patient monitor. Virtual pacing, defibrillation, and AED functions are supported for patient treatment. The operation and workflow are same with those of real medical equipment. Key actions, such as defibrillation discharge, are automatically logged.

1) Both demand pacing and fixed pacing can be selected. The pacing rate and current can be set, and the pacing ECG waveform will be displayed with successful setting.
2) Thesystem simulates the entire process of energy adjust, charge, and shock, producing the authentic charging sound of a real defibrillator.
3) The system simulates the operational interface of a real AED, providing complete voice-guided prompts. It automatically analyzes the simulated patient's cardiac rhythm to determine whether defibrillation is required and delivers clear voice instructions for operation. An integrated CPR compression metronome is also available for training assistance.

AI Function & Peripheral Simulation Devices

OPTIONAL

1

Free-Form Patient Dialogue

Learners can engage in free-form dialogue with the simulated patient using casual spoken language without being restricted to predefined scripts. The patient will consistently respond with answers that align with the predefined medical history and condition parameters of the case.

2

High-Performance Computer for AI Function

CPU: 24-core, 32-thread processor
RAM: 32GB+
GPU: RTX 4090 24GB or better
System Drive: 1TB+ NVMe SSD

PERIPHERAL SIMULATION DEVICES

Simulated Syringe Pump (optional)

- Size: 275mm x 200mm x 110mm
- Buttons: Select, Flow Rate, Total Volume, Reset, Fast (expelling air), Check, Mute, Start/Stop
- Automatic recognition with indicator light upon placement of a 20ml or 50ml syringe onto the pump
- Selectable injection flow rate and total volume. “Start/Stop” button can pause and start the injection operation
- Real-time display of the injected volume, with a “Reset” button
- The “Complete” indicator light signals the end of the injection process, accompanied by an alarm sound that can be muted
- The operations can be wirelessly uploaded to the system log in real time

Simulated Infusion Pump (optional)

- Size: 265mm x 155mm x 135mm
- Buttons: Select, Flow Rate, Total Volume, Reset, Fast (expelling air), Check, Mute, Start/Stop
- The “Door Open” indicator light signals the pump door has been opened
- A real infusion catheter can be placed inside the pump, which can be positioned on the infusion stand for convenient practice
- Selectable injection flow rate and total volume. “Start/Stop” button can pause and start the injection operation
- Real-time display of the injected volume, with a “Reset” button
- The “Complete” indicator light signals the end of the injection process, accompanied by an alarm sound that can be muted
- The operations can be wirelessly uploaded to the system log in real time

PERIPHERAL SIMULATION DEVICES

SSimulated Blood Gas Analyzer (optional)

- Size: 310mm x 220mm x 100mm
- Buttons: ON/OFF, Analyze, Print
- The system can continuously calculate PaO2, PaCO2, SaO2, P(A-a) O2, BB, BE, Lac and pH values and update the data to the blood gas analyzer
- The blood gas analyzer can analyze the placed simulated blood sample and display the data results, which can be printed at any time
- The operations can be wirelessly uploaded to the system log in real time

Simulated Thermometer Gun

- A simulated thermometer gun is provided for non-contact temperature measurement
- The measured temperature is consistent with data of the patient monitor

Connect with QuakeLogic – QL-TYE9090

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For advanced nursing simulation systems, medical training solutions, emergency response education, and clinical skill development applications.

Our Unwavering Commitment to Operational Excellence

Certified Quality Assurance

Compliant with ISO 10218, ISO/TS 15066, ISO 13849, and Cleanroom Class 5 standards, ensuring system reliability, clinical accuracy, and operational performance.

Pioneering Industry Leadership

Delivering advanced medical simulation solutions with realistic training environments, high-fidelity patient simulation, and comprehensive clinical education capabilities.

Dedicated Client Success

Providing responsive technical support, installation assistance, and long-term service solutions for reliable and effective medical training operations.

Explore Our Complete Product Portfolio

Scan to Access Cutting-Edge Solutions

Discover how QL-TYE9090 delivers high-fidelity nursing simulation with realistic patient interaction, advanced clinical training scenarios, and comprehensive emergency response education for hospitals, medical institutions, and training centers.

With its immersive simulation capabilities, wireless design, and extensive clinical features, the QL-TYE9090 provides a reliable, scalable, and effective solution for modern healthcare training environments.

Learn more about system specifications, software capabilities, and integration options at:

www.quakelogic.net