Angelie EIS System
Electrical Impedance Segmentography

When the smallest thing matters
Continuous Monitoring Non-Invasively

The Angelie EIS System monitors the impedance across four quadrants of the lung.
- Impedance changes reflect changes in volume for each lung quadrant
- Detect regional changes in lung ventilation
  - Atelectasis
  - Pneumothorax
  - Misplacement of tracheal tube
  - Effects of Surfactant administration

Accurate and Quick

Electrical Impedance Segmentography (EIS) is a Non-Invasive method to continuously record the distribution of air in the lungs.

The Angelie EIS System:
- Specially designed for neonatal and paediatric bedside use
- Impedance monitoring data continuously displayed as values, waveforms and parameters
- The Angelie EIS lets you visualise the distribution of ventilation
- Impedance changes reflect changes in delivered tidal volumes
- The system works on both spontaneously breathing and ventilated patients

See changes as they happen

- Heterogeneous distribution of air and ventilation between right and left lung as well as within each lung, negatively affects gas exchange.
- This constitutes a therapeutic dilemma, since increasing ventilatory support may also increases the heterogeneity and gas exchange disturbances.
- The Angelie EIS monitor shows changes in Impedance reflecting changes in Tidal Volume
- Angelie EIS helps you to manage the ventilation settings by monitoring lung volume changes
See changes immediately

Until now, medical staff have used X-Rays on a regular basis to assess the regional distribution of lung ventilation.

With the Angelie EIS System:
- A radiation-free assessment method
- Shows impedance data in real-time
- Monitor changes during therapeutic procedures
  - Adjustment of ventilator settings
  - Recruitment manoeuvres
  - Patient positioning
  - Tracheal tube / lung suctioning

Monitor ventilation across all four quadrants
- Premature neonates have immature respiratory systems. This makes the intubation of a neonate a delicate and complicated procedure.
- Possible complications of neonatal intubation include damage to the pharyngeal structures; intubation of the oesophagus and inefficient oxygenation.
- Endotracheal tubes may become obstructed by secretions or become misplaced due to being uncuffed tubes.
- Clinicians are able to use the Angelie EIS System to access and confirm continued correct placement of the ET tube, patency of the ET tube and effective gas distribution to all four quadrants.

Get prior warnings of pneumothorax
- Due to the incomplete development of the respiratory systems of premature neonates, they are very susceptible to Chronic Lung Disease.
- Pneumothoraces are one of the complications associated with mechanical ventilation, especially in premature infants and infants with Meconium Aspiration Syndrome.
- Asynchronous ventilation and volutrauma are also contributing factors.
- The Angelie EIS System can be used as an ‘Early Warning System’ monitoring the normal and abnormal distribution of gas within the infant’s lungs.
Fixation

- The Angelie EiS is noninvasive and has no known hazards or adverse effects associated with it.
- This combination makes the Angelie EiS well-suited for continuous respiratory monitoring of neonatal intensive care patients right at the bedside.
- Using only ten small electrodes the system can be applied quickly and easily.
Screen Display

- Bright, high-resolution screen display
- Easy determination of the impedance changes within each quadrant of the baby's lungs.
- The lower half of the screen displays two graphs that show trend information.
- Allows the user to see both long term and short term changes.
- Touch screen controls allow easy adjustment to each graph.
Additional Safety

Enhanced Monitoring

- Trend display of changes in segment impedance represents regional distribution of ventilation
- Trend display of changes in segment impedance represents changes in end-expiratory lung volume

References:


**EIS System**

**Amplifier**
- Number of channels: 4 (optional 8)
- Electrode input: 4 Bipolar
- Input impedance: >800 MOhm
- CMRR: >110 dB
- Noise: Less than 0.5 µV (RMS)
- Calibration: Integrated sine wave generator
- Sensitivity: 0.01 µV/cm to 10 mV/cm (in 19 steps)
- LFF: 100 Hz
- HFF: 10 kHz
- ADC: 16 bit
- Notch filter: 50/60 Hz
- Isolation: Type BF
- System power: 5 V (via USB connection)
- Max USB cable length: 1.2 m (Longer cable lengths can cause interruption/corruption)

**Angelie Touchscreen PC**

**Hardware**
- Processor: Intel Sandy Bridge CPU
- System memory: DDR3 up to 8 GB, 1066/1333 MHz
- Graphic memory: Intel Graphic 2000/3000, integrated on CPU, freq 850 MHz
- LCD touch screen: 15.6” LED LCD
- Brightness: 220 cd/m²
- Resolution: 1366 x 768
- Touch screen: a P-Capacitive Multi-touch technology

**External I/O**
- USB ports: 4 type A
- Serial port: 4 RJ45 COM ports
- Parallel port: 1 D-sub 25F
- LAN: 1 RJ45
- Audio jack: 1 mic in, 1 line out

**Electrical**
- DC input: 19 V / 6.32 A
- Power supply: 65 W/19 V
- Power on: On switch
- Thermal management: 1 internal cooling fan
- Audio speakers: 2 x 2 W speakers
- EMC: FCC class A/CE mark/EN60601-1-2

**Other**
- Peripherals: 2M webcam
- Wi-fi: No WiFi card

**Environment**
- Operating temperature: 0°C ~ 35°C
- Storage temperature: -20°C ~ 60°C
- Humidity: 20% ~ 85% RH non-condensing
- IPX rating: IP65
- Dimensions: 396 x 48 x 245 mm
- Weight: 4.5 kg
- Mounting: 75 x 75 mm standard VESA/Panel mount

**Operating Systems supported**
- OS: Angelie approved for Windows 7

**Touchscreen PC PSU**

**Input specifications**
- Input voltage: 90 – 264 VAC
- Input frequency: 47 – 63 Hz
- Input current: 1.60 A (RMS) for 115 VAC, 0.80 A (RMS) for 230 VAC
- Earth leakage current: 180 µA max @ 264 VAC, 63 Hz
- Touch current: 100 µA max @ 264 VAC, 63 Hz

**Output specifications**
- Output voltage: 19 V
- Min current: 0 A
- Max current: 6.32 A
- Tolerance: +/-5%
- Ripple and noise: 190 mV
- Max power: 120 W

**Average active efficiency (typical)**
- 115 VAC: 87%
- 230 VAC: 86%

**Cables**
- PSU mains cable
- USB cable (from touchscreen to Angelie)
SLE is a world leader in the design and manufacture of neonatal ventilators.

Years of ventilation experience have given the company an understanding of the challenges that nurses and clinicians are facing when caring for the tiniest and most critical babies.

From being the pioneers of neonatal Patient Triggered Ventilation (PTV) in the 1980’s, to the introduction of combined HFO (High Frequency Oscillation) in the 1990’s, and the design of the first touch-screen Neonatal Ventilator in the 2000’s, SLE has maintained a position of strength in neonatal ventilation.

The company’s guiding principle is to support clinical and nursing staff in their everyday work.

The knowledge and experience gained during years of development is evident in all of SLE’s products: the result of our ongoing commitments to innovation, competency and care.