

EQUANOX™

Regional Oximetry Technology



The Next Generation in Regional Oxygen (rSO₂) Saturation Monitoring

The latest advancement in near-infrared spectroscopy (NIRS), **EQUANOX** rSO₂ technology offers real-time management of patients at risk of compromised brain or other major organ injury. Studies show that early, efficient management with regional oximetry can improve patient outcomes and positively impact the cost of care. ^{i,ii}



EQUANOX: *Next Generation Technology*

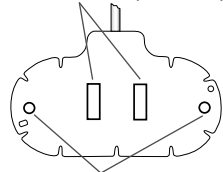
EQUANOX's patented NIRS technology measures the balance of oxygenated and deoxygenated hemoglobin (HbO₂ and Hb) in the target tissue with greater accuracy and consistency.

EQUANOX technology offers:

- Enhanced regional oxygen saturation (rSO₂) accuracy designed to eliminate the impact of surface effects (i.e. skin, bone, meninges, etc.) ⁱⁱⁱ
- Improved operational efficiency by eliminating the need to capture a new baseline when sensors are changed or repositioned ^{iii, iv}

The EQUANOX Difference: *Patented Sensor Technology*

Photo Diodes (receivers)



Light-Emitting Diodes (transmitters)

EQUANOX technology's innovative sensor design utilizes patented dual emitter architecture that acts to cancel out the effects of surface variability — while the three-wavelength technology reduces the sensitivity of the measurement to ancillary tissue effects. These technological advancements improve measurement accuracy and repeatability — eliminating clinically relevant measurement variability due to repositioning or changing of the sensor. Coupled with **EQUANOX's** near instantaneous signal acquisition, this level of measurement accuracy results in an enhanced functionality.

EQUANOX Technology: *Proven Accuracy in Cerebral Applications*

EQUANOX accuracy proved superior to conventional NIRS cerebral oximetry in validation testing at Duke University with an A_{RMS} of 2.7 (trending data) relative to jugular bulb measurements ($SjvO_2$).^{iv} Eighteen healthy volunteers completed a standard breathe-down hypoxia protocol while cerebral oximetry data was obtained simultaneously from arterial and jugular bulb venous blood samples.

Clinical testing of the measurement repeatability was carried out with 40 subjects undergoing multiple rSO_2 measurements with multiple same-sensor replacements, as well as multiple sensor changes.ⁱⁱⁱ At ± 2 digits, repeatability is clinically nominal and potentially superior to conventional technology.

EQUANOX technology Used in Cerebral Applications

Unique to the **EQUANOX** technology, dual emitters alternately create pairs of reflected light paths through surface tissue to the shallow receiver and through the cerebral cortex to the far receiver. The system algorithm first uses the dual emitter architecture to remove surface effects that modulate light amplitude and then uses the shallow path to remove the surface tissue components from the deep path signals - resulting in a cerebral cortex measurement that is unaffected by intervening tissue or surface effects.

Nonin Medical: Leaders in Noninvasive Physiological Monitoring

Nonin Medical continually advances new technologies and healthcare delivery solutions designed to improve patient care. With over 20 years of signal processing and NIRS sensor design expertise, our innovative technologies enable clinicians to monitor a patient's true condition — even in the most challenging environments. Today, with over one million pulse oximeters sold worldwide, clinicians trust the quality, support and experience Nonin delivers. The progression into regional oximetry is a natural step that enables us to leverage our core competencies and expand the reach of our solutions for improving patient outcomes.



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