

2-in-1 PC/104 SBC Powers Breathing Simulator



IngMar Medical is the world leader in breathing simulation – a distinction built on a solid history of superior product performance, innovation and customer service. Since 1993, IngMar Medical's vision has been to help raise the quality of patient care through the use of breathing simulators, lung models, and test lungs. Their products are used worldwide to develop new respiratory therapy products and treatments, test to insure the quality and safety of respiratory therapy products, and train clinicians to achieve the highest level of patient care.

IngMar's ASL 5000 Adult/Neonatal Breathing Simulator is the world's most sophisticated breathing simulator, and the only high fidelity neonatal breathing simulator. The ASL 5000 is a digitally controlled, high fidelity human breathing simulator. It can craft a wide variety of real life respiratory scenarios ranging from neonatal to adult patients. A unique feature of the ASL 5000 is its ability to breathe spontaneously while being ventilated. This allows it to meet the full spectrum of breathing simulation challenges, including coughs, apnea, active exhalation, playback of actual patient recordings, and even snoring.



The ASL 5000 serves as an artificial respiratory patient, creating any desired breath pattern without a live patient. It is used in many applications worldwide including medical and respiratory care education, medical simulation, and research and development. It is comprised of an embedded single board computer (SBC), data acquisition subsystem, display module, and digitally controlled piston to simulate breathing modes.

In developing the current version of the ASL 5000, IngMar specified a compact, low cost SBC with higher performance than its predecessor, and a state-of-the-art data acquisition module that would provide all of the control and measurement needed for its many modes of operation and interface easily with the SBC. Low weight for portability, ruggedness, and low cost were also important criteria in selecting these new computing elements.

Diamond Systems' Helios rugged PC/104 single board computer with integrated data acquisition was selected as the embedded computer for ASL 5000 breathing simulator. Helios' Vortex86 CPU provided the right balance of performance, CPU power and cost for the simulator. However, what really made Helios the ideal SBC was its 2-in-1 capability featuring a fully integrated data acquisition circuitry. This circuitry provided all of the necessary A/D, D/A and digital I/O interfaces required for the system. The compact Helios SBC replaced two boards in the original system, the SBC and the data acquisition subsystem, significantly reducing the size, weight and cost of the electronics.

