



Revolutionizing Eye Surgery with Advantech AI Solutions

Background

3C products have become indispensable in the digital age. Modern individuals spend extended hours using computers, smartphones, and tablets, leading to an increased frequency of close-range eye usage. This trend has resulted in a rise in ophthalmic diseases, consequently driving demand for eye-related examinations and surgeries. To address the growing demand for ophthalmic care, an international ophthalmic surgery equipment manufacturer has actively advanced its product iteration plans. By integrating Advantech's POC-8 medical panel PC and the USM-300 medical-grade edge AI computer into its high-end surgical microscope equipment, the manufacturer has achieved precise and swift identification of lesions. These devices also enable complete recording of surgical procedures and real-time transmission of images to other medical systems, helping doctors safeguard eye health.

Enhancing Microscope Technology by Integrating Advantech Medical Products



This ophthalmic surgery equipment manufacturer, with over 80 years of history, specializes in contact lenses, eye examination instruments, and surgical equipment, distributing to over 180 countries.

Among its high-end ophthalmic surgical devices, a specialized microscope integrates Advantech's POC-8 medical panel PC to project eye images onto a screen, eliminating reliance on small eyepieces.

This enhances image clarity, improving surgical precision and reducing procedure time.

To further optimize performance, the manufacturer upgraded the imaging system with next-gen lighting, optical designs, and hardware—transitioning to POC-8 and USM-300 medical-grade AI computers. This enhances autofocus, reduces manual adjustments, enables full surgical image recording, and integrates with medical systems for improved workflows and monitoring.

Advantech Product Manager Jerry Hsiao explains, "The POC-8 and USM-300 share a motherboard, simplifying integration. The POC-8 manages autofocus and focal tracking, while the USM-300 handles image collection and external transmission."

Over 10 Years of Collaboration Make Advantech the Ideal Partner

The collaboration with this ophthalmic surgery equipment manufacturer on medical panel PCs has lasted over a decade," says CH Wang, Advantech Product Manager. Advantech's product stability, long-term supply, and after-sales service have been key to this enduring partnership. Beyond supplying components, Advantech proactively assisted with engineering changes when component discontinuation occurred, reinforcing a reliable partnership.

With IT advancements, the existing medical panel PC with an Intel 5th Gen CPU and a single image capture card could no longer meet the demands of next-gen lighting technology, necessitating new hardware. Advantech's strong track record and product advantages made it the preferred upgrade partner.

Advantech provides compliant medical panel PCs and AI computers with shared motherboards, allowing a unified software architecture that reduces development time, integration, and maintenance costs. Its single-window hardware maintenance service further streamlines issue resolution, enhancing the efficiency of surgical microscope equipment.

Customization for Practical Needs

CH Wang cites examples of customized designs for the medical panel PC beyond logo font and color adjustments. First, the I/O panel was redesigned. Since the panel PC is mounted at the top of the equipment, Advantech redesigned the I/O panel to ensure a clean appearance and reduce contamination, embedding the wiring into the monitor arm.

Second, the motherboard design was adjusted. When this ophthalmic equipment manufacturer first approached Advantech, the latter was in the development phase of its medical panel PCs. This allowed certain functional requirements to be incorporated into standard specifications, reducing customization costs. For instance, the manufacturer requested ECC (Error Correcting Code) memory functionality. Advantech adjusted the motherboard circuitry to enable automatic error detection and correction during data access, ensuring system stability. "Although modifying the motherboard design increased costs, Advantech committed to meeting customer expectations," CH Wang emphasizes.



Jerry Hsiao shares a customization example for the USM-300. Since the manufacturer uses mobile carts for its surgical microscope equipment, with a hard-shell enclosure beneath the cart for the USM-300, space constraints necessitated repeated adjustments to the USM-300's design. For example, internal components were reorganized using stacking and interleaving methods to optimize placement while maintaining thermal efficiency. The USM-300's rectangular exterior was reshaped, with corner cutouts enabling it to fit seamlessly into the enclosure. The power button was also repositioned alongside the I/O panel for easier maintenance.

Future Prospects

Advantech aims to deepen its collaboration with the ophthalmic surgery equipment manufacturer, extending beyond surgical microscopes to other surgical devices. Together, they hope to build a more comprehensive smart medical ecosystem, delivering high-quality and holistic healthcare services to patients.