

# Laser Eye Surgery

Industry: Medical

This company is a leading developer, manufacturer and marketer of ophthalmic laser systems and related products designed to correct common vision disorders such as nearsightedness, farsightedness, and astigmatism. They were the first company to receive FDA approval for its excimer laser system for the correction of mild to moderate myopia in the U.S., and in 1999 became the first commercial excimer laser manufacturer to receive FDA approval for the popular LASIK procedure. LASIK stands for Laser Assisted In Situ Keratomileusis. Which literally means, "to shape the cornea within, using laser."

What sets this customer's machine apart from others is the tracking system technology originally developed by our customer for the Strategic Defense Initiative, or 'Star Wars'. This technology enables the machine to track and compensate

for rapid eye movements during surgery. Previously approved laser systems require patients to minimize eye movement during surgery by voluntarily fixating their eyes on a small light located just above the patient. However, when the average person fixates on something, they still have five saccadic eye movements per second. Our customer's system has the ability to follow eye movements in real time, greatly reducing the dependency of stable fixation by the patient. This allows for precise corneal shaping. Reshaping of the cornea such that light entering the eye is focused into images on the retina is the ultimate goal of successful LASIK surgery.



The machine uses a small-spot beam of less than 1 mm, which is moved rapidly around the cornea in a computer-controlled pattern of tiny, overlapping spots. The amount of corneal tissue that is removed per pulse is very slight. The laser in this machine will remove small amounts of tissue from the cornea-less than the thickness of a human hair. This helps to create a smooth post-operative corneal surface.

With the tracker disabled, the lines show the high degree of random eye movement. With the tracker enabled, the laser is locked onto the eye throughout the procedure. This ensures accurate placement of the laser beam. AMC's part in this machine is to drive two linear motors which accurately position mirrors during surgery. These mirrors reflect the laser beam using an Advanced Motion Controls B25A20AC drive in current mode. A PC based motion card controls the drive using a high-resolution tape scale encoder for position feedback.



Above: Standard B25A20AC drive/amplifier may differ in appearance from the actual custom product used.

We have made some board level changes to the amplifier to accommodate the special needs of this customer. Some of the major requirements consist of size, performance and price of the drive. But what has made us stand out among the rest is the willingness of AMC to work with the customer on modifications to optimize the performance of the amplifier specific to the application.

More than two thirds of AMC products are custom products targeting a specific customer application. We understand that each customer has different requirements and expectations. Ask us how we can build a custom amplifier specifically for your application.

