Case History 21
Wavefront Aberrometer

Market

Ophthalmology

Client Type

Established medical device OEM (Alcon Surgical)

Unmet Need

Non-contact, optical wavefront device to measure the refractive error of the human eye to enable an enlarged treatment zone for LASIK surgery.

Approach

Redesign a previous generation device to improve optical performance, electro-mechanical actuation, and ergonomics.

Product Features

A laser is focused onto the retina, and an optical wavefront emanates from the spot and passes out through the lens and cornea of the eye. The topology of the transmitted wavefront is measured using a microlens array and area detector (Hartmann-Shack sensor). The device measures both low- and higher-order refractive aberrations more accurately than any other instrument. This data is transmitted to a LASIK machine, which sculps the cornea to unprecedented levels of accuracy. The system enables a larger treatment zone of 8mm diameter, which reduces or eliminates glare and "starring" experienced by LASIK patients during night vision. Users also report that up to 90% of their patients achieve "super-vision", or better than 20-20 acuity.

Services Provided by OTI

- Optical design and engineering
- Industrial design and ergonomics
- Mechanical engineering, including liquid resin cast part design and vendor sourcing
- Development of custom fabrication and assembly methods
- Complete FDA-compliant documentation set, including all drawings
- Prototyping, verification testing and transfer to manufacturing

Client Comment

In selecting third party engineering partners, in addition to the sense of teamwork conveyed in the first contacts, I always look at the quality and relevant experience of the engineers who will be actually assigned to the project. OTI has a stable of high quality engineers on tap and those assigned to our projects were really top notch. As important as the technical contributions, the Project Management skills of the OTI team, and Randy Chinnock in particular, exceeded those of our internal team and really helped make the projects successful. OTI NEVER missed a deadline and as an added bonus was extremely accommodating and professional when we needed to change the scope of the project in midstream. I would use OTI without hesitation in the future.
- Steven Bott, Vice President, Refractive Research & Development

114 Pleasant St.
Southbridge, MA 01550
T 508 765 8100
F 508 765 8101
E info@optimum-tech.com
www.optimum-tech.com

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