

Unique Optical Label and Reader for Security

Physical Optics Corporation Creates an ID Label Nearly Impossible to Forge.



Physical Optics Corporation Label Reader

The Challenge—Product counterfeiting, identity theft, and document forgery have been rampant since the middle 1990s. “Smart cards,” laser cards, and other security cards and labels can be broken into, regardless of their technical sophistication. According to industry estimates, counterfeit card fraud rose by 121%, from \$95 million in 1999 to more than \$211 million in 2003. To address this problem, Physical Optics Corporation (POC) proposed a potentially foolproof method to verify and authenticate products and documents through their novel Optical Maximum Entropy Verification (OMEV) system.

The challenge was to use the concepts of statistical optics, pattern recognition, and signal processing to develop a phase mask label that provided a unique optical pattern and a reader to read the pattern and authenticate the label. Because of the high technical risk and innovation required in this project, POC applied for and won an ATP award.

The Outcome—The ATP-funded project ended in 2000 with the successful development of the OMEV technology. The verification system compared the optical pattern on an unknown label to a master phase mask or label and authenticated that they matched. The matching would be done by a correlator or reader using complex mathematical equations that made such a label almost impossible to forge. POC received

three US patents for the OMEV technology and favorable reception from several companies and Federal agencies who are interested in applying the technology to protect products, documents, and credit cards.

POC developed the OMEV technology into a product for commercialization called the Optikey system. Optikey can be used in military and civilian identification cards, passports, visas, Social Security cards, bank notes, credit and debit cards, card-entry door locks, electronic media like CDs and DVDs, and airline baggage checking, as well as for product protection. With obvious economic and security benefits of such a system, heightened after the terrorist attacks on the World Trade Center in New York on September 11, 2001, POC has launched efforts to commercialize Optikey by licensing the technology to another company, also called Optikey.

As of 2006, Optikey had received a positive response from product manufacturers, the entertainment industry, government agencies, and credit card companies. The U.S. House Appropriations Committee allocated \$2 million in fiscal years 2005 and 2006 to incorporate this system into existing security cards in the Departments of Defense and Homeland Security and identification cards for Federal restricted entry offices.

Partnering Organization:	Physical Optics Corporation, Torrance, CA
Project Duration:	10/1/1997 – 9/1/2000
Project Cost:	\$1.1M ATP cost-share; \$1.2M industry cost-share
Project Brief:	http://jazz.nist.gov/atpcf/prjbriefs/prjbrief.cfm?ProjectNumber=97-01-0244
Project Status Report:	http://statusreports.atp.nist.gov/reports/97-01-0244.htm Research conducted June 2006