Boulder Nonlinear Systems

Marty Best
Boulder Nonlinear Systems
May 9, 2001

Boulder Nonlinear Systems, Inc. designs, manufactures and sells liquid crystal based photonics devices and systems. The company is experienced in developing components based on the highest performance ferroelectric and nematic liquid crystals.

Introduction
Boulder Nonlinear Systems is a Colorado company specializing in opto-electronic devices based upon advanced liquid crystal materials and processes. Its unique analog liquid crystal on silicon modulators are used in applications ranging from holographic storage to microscopic cell manipulation. The companies advanced liquid crystal technology is used in telecommunications, medical instruments, defense, and manufacturing.

History
The company was founded in 1988 by Steve Serati and Gary Sharp. With backgrounds in electrical engineering and liquid crystal optics, they began by building optical processors and phased array beamsteerers for LIDAR applications. The company gained a reputation for innovative research and development in optical systems. Over the years, the projects have grown in optical processing and leading edge optical components.

Today, companies from all over the world call on BNS's thirteen years of experience in liquid crystal design and manufacturing. Its customer base, including fortune 100 companies, purchases devices built in state of the art clean room facilities located in Lafayette, Colorado.

Mission
The BNS corporate mission is to advance the state of the art in liquid crystal device theory, design and fabrication and translate this advanced technology into quality products for a variety of commercial and industrial applications.

Technology
The BNS signature product is its family of analog liquid crystal on silicon (LCOS) spatial light modulators. These devices are used to modulate a beam of incident light in order to add information to it, or to shape, correct, or steer it. A unique feature of the BNS LCOS devices is their analog mode of operation. Most such modulators are binary devices which have an on and an off state. The BNS analog devices offer analog modulation that permits up to 256 optical states of the device. This analog operation allows a superior ability to control the beam of light. BNS spatial light modulators offer very high frame rate operation including refresh rates as high as 18-Khz. Although these rates are much higher than necessary for human interaction, they allow machine vision rates of operation never before available.

Boulder Nonlinear Systems, Inc.
450 Courtney Way, Suite 107
Lafayette, Colorado 80026 USA
303-604-0077
866-466-0506
info@bnonlinear.com

The analog operation also allows construction of liquid crystal devices for applications that have never before existed. The company's award winning non-mechanical beam steering device can control the reflected angle of a beam of light under computer control. This has opened exciting new frontiers in optical storage and telecommunications.

Component Product Family

The company offers its Spatial Light Modulator systems in resolutions of 128x128, 256x256, and 512x512. It also offers a beam steering system based upon its 1x4096 linear array device. BNS also offers Liquid Crystal on Glass (LCOG) devices for a variety of applications. These devices include tunable filters, optical shutters, variable retarders, and polarization rotators.

Application Areas

The BNS customer base uses our products in demanding applications from many industrial disciplines. Our customers' applications include telecommunications, medical components, volumetric display, data storage, research, and defense.

Manufacturing Facilities

Our liquid crystal devices are constructed in our state of the art manufacturing facility in Lafayette, Colorado. Our advanced Class 10 clean room allows us to maintain the most demanding standards necessary for producing high-quality optical components.

Boulder Nonlinear Systems, Inc.
450 Courtney Way, Suite 107
Lafayette, Colorado 80026 USA
303-604-0077
866-466-0506
info@bnonlinear.com