Can You Imagine . . .

. . . a user-configurable transceiver that brings gigabit-per-second data transmission to computing applications.

VIXEL MEETS DEMAND FOR HIGH-CAPACITY INTERCONNECT DEVICES

As the global network grows in size and complexity, user-friendliness and flexibility will become the key criteria. Data transmission between older copper wire and new optical networks can link communication nodes without retooling the entire information infrastructure. This capability is crucial when extending new communication methods to traditionally underserved areas, such as developing countries and the rural United States.

To help interweave the various threads of the communications network, Vixel Corporation (Broomfield, CO) acquired a leading information management company, Western Digital (Lynwood, WA). The move cements an alliance that brings gigabit-per-second data transmission to computing applications. Through this alliance, Vixel introduced a new product, the IntraLink 1000™ Fibre Channel hub.

USING BMDO-FUNDED LASER TECHNOLOGY, VIXEL HAS MOVED AGGRESSIVELY INTO THE HIGH-SPEED COMMUNICATIONS MARKET.

The device, a user-configurable transceiver that allows communication between optical and copper wire topologies, offers gigabit-per-second data rate performance and can be reconfigured for different media, including fiber optics and copper. Server and storage array manufacturers intend to deploy this product for distributed database applications. EMF Associates, a technology and marketing group, estimates that Fibre Channel Arbitrary Loop hub sales will top $500 million by the year 2000.

The agencies that funded Vixel's research in optical data transmission and storage included BMDO; the U.S. Army, Air Force, and Navy; NASA; the National Institutes of Health; and the National Science Foundation. This research led to the development of vertical cavity surface-emitting lasers (VCSELs). VCSELs are small, high-powered lasers that operate at high efficiency and are the foundation of Vixel's LASE-ARRAY™ products. LASE-ARRAYs are responsible for the fast optical switching and high-bandwidth characteristics of its new Intralink product.

■ Vixel has supplied samples of its IntraLink 1000™ Fibre Channel hub to Sun MicroSystems and Compaq Systems Division.

To expand LASE-ARRAY manufacturing, Vixel acquired the assets and technology of Bandgap Technology Corporation. This acquisition includes a 5,000-square-foot cleanroom, with machines tailored for producing the semiconductor material for VCSELs. This move allows Vixel to consider new application areas, such as optical interconnects for computers and workstations, detector arrays, multifiber optical ribbon, and machine vision components. Other possibilities include optical data storage and medical instrumentation.

ABOUT THE TECHNOLOGY

VCSELs facilitate optical data transmission. Unlike other diode lasers, which emit light from their edges, VCSELs emit laser beams perpendicular to their surface. This design creates the ideal geometry for stacking VCSELs side-by-side in 1- and 2-D arrays. It also allows VCSELs to be 20 to 50 times smaller than edge-emitting diode lasers. Edge-emitting lasers produce elliptical beams whose high divergence makes focusing difficult; VCSELs produce nearly circular beams that diverge considerably less than the elliptical beams and thus require less sophisticated optics to focus the beam.

Compared with traditional lasers, VCSELs have been relatively inefficient. However, Vixel modified the VCSEL design to approach the efficiency of edge-emitting lasers. Wall-plug efficiencies of its VCSELs are now measured at about 10 percent, resulting in smaller, higher power lasers with extremely fast switching speeds. Also, Vixel's LASE-ARRAYs can operate in wavelengths ranging from 750 to 1,050 nanometers.