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## Explosive Growth for Industrial Fiberoptic Networking

### Study also shows Ethernet being integrated with the fieldbuses

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The industrial control networking, automotive, and consumer data link markets are converging at data rates of 100 Mbps and higher, says a research report from network market analyst Beach Communications.

From 10 Mbps to 400 Mbps, plastic optical fiber (POF) and polymer clad silica (PCS) solutions for high-speed, short and moderate distance data links are cost-competitive with copper cable. POF is superior to copper cable in low bit-error-rate performance, especially in electrically noisy environments.

The study maintains that the convergence is being driven by three major forces: the integration of Ethernet with the fieldbus standards for industrial control networks in factory automation applications; automotive adoption of POF information and entertainment networks in automobiles; and the extension of IEEE-1394 (Firewire) to higher data rates and longer distances in the consumer electronics market. The Beach study indicates the worldwide total POF market at \$444 million for 2002 and predicts growth to \$969 million for 2006, an annual growth rate of 22%.

POF and PCS cable have been used in industrial control networks for over 15 years. Many proprietary networks were configured on the factory floor to connect controllers to devices and sensors to monitor data and provide simple control feedback to production lines. The study points out growth accelerated when standards organizations such as Profibus, Interbus, ControlNet and SERCOS adopted POF and PCS as low-cost link media for electrically noisy and performance-critical applications.

The next generation of industrial control networks is moving to 10/100 MB Industrial Ethernet, operating over extended temperature ranges and harsher environments where the basic elements of the IP protocol are transferred from the business systems to the control, device, and sensor levels of the networking hierarchy in a deterministic fashion. The Beach study notes organizations such as ProfiNet, Interbus Club, ControlNet Intl., IOANA, and ODVA are defining interface specifications to integrate Ethernet with the widely deployed Profibus, Interbus, ControlNet, and DeviceNet standards. In addition to the move to higher-data-rate Ethernet, the study notes the all-fiberoptic SERCOS standard has doubled its data rate to 16 MB.

The traditional technologies for low-cost data links used in industrial control, consumer electronics, interconnect, and automotive applications, have been transmitters using 650 nm red LEDs, silicon PIN diode detectors, and SI-POF or PCS fiberoptic cable, says the report. The approximate cost of a 10 m data link is about \$30 and has not changed much in the past five years.

However, with the acceptance of POF and the Media Oriented Systems Transport (MOST) interconnectivity standard, the *de facto* standard for multimedia networking in the automotive market, several new companies have entered the business of supplying SI-POF and GI-POF; transmitters using red LEDs, RCLEDs and VCSELs; and receivers. It is expected that the same 10m data link will soon cost less than \$15 due to cost reduction benefits of increased volume.

Significantly higher market growth rates are expected in the industrial control networking market as POF and PCS displace copper cable networks at a much higher rate, says the study. It estimates the worldwide market for POF data links in industrial control networks will grow from \$133 million in 2002 to \$282 million in 2006, an annual growth rate of 21%.

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