

Plastic fibre makes light work of industrial comms

Use of cheap optic links using plastic optical fibre is set to boom following successful take-up in the automotive and consumer markets. What is already happening there will surely follow for industrial comms. POF has always been known as low cost but has been limited in distance and data rate compared to glass fibre. That will change with advances in step index and graded index plastic optical fibre. **Richard Beach**

The market for POF data links is estimated by Information Gatekeepers and Beach Communications at \$461M in 2002, growing to \$1136M in 2006. This represents a growth rate of 25% per year. The three key markets for low cost data links – automotive, industrial control and consumer – are converging at 100Mbps. At this and higher data rates POF is a practical alternative to copper cable.

The convergence is being driven by higher data rates, longer links and EMI demands of the industrial control market. The acceptance of POF networks in automobiles together with availability of low cost optics and electronics has convinced the more sceptical industrial base. This is likely to accelerate the replacement of copper data links.

The automotive market has committed to the MOST standard at 50Mbps. The next step will be the 100 or 200Mbps implementation with either MOST or IEEE-1394. The industrial control networking market is moving from the 12-16Mbps Profibus and SERCOS standards to the 100Mbps Industrial Ethernet standard. The consumer market is consolidating around the IEEE-1394b standard at 100/200/400/800Mbps.

The technology advancements in graded index plastic optical fibre (GI-POF) and low cost transceivers using red and green LEDs and cheap laser diodes are driving renewed interest in POF data links. Several companies have introduced improved SI-POF and GI-POF including Mitsubishi, Digital Optronics, Samsung and Asahi. A number of semiconductor companies have introduced suitable diodes including Firecomms, Infineon, Osram, Hamamatsu, Zarlink, and Honeywell.

Twelve of the major European car makers are shipping MOST networks in 14 different models. The North American and Japanese automobile companies are actively working on product plans for their networks. The year 2002 saw the shipment of 3.5M nodes, with 15M nodes forecast for 2005.

To reduce the cost of the cable assembly, the 50Mbps transceiver can be integrated into

the data link cable connector. For current implementations, the FOT is in a plastic header in the system package. The current price of the transceiver pair is \$8, with committed prices to \$3.50 with volume increases.

Industrial control

The industrial networking segment, which has been the traditional market for low cost fibre optic data links using POF, is going through major transformation with the integration of Industrial Ethernet alongside traditional industrial standards. The various sector groups such as Profibus, Interbus, and ControlNet are expected to provide the level of standardisation necessary for the rapid growth of optical copper link replacements.

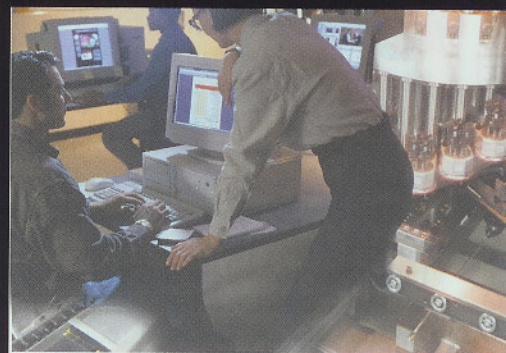
Over the period from 1997 to 2001 proprietary networks have gone from 60% of the market to just 30%. Standardisation around Ethernet, Profibus, Interbus, ControlNet and SERCOS have improved interoperability and lowered costs. The next standardisation step is the integration of Ethernet with field bus standards. PROFINet and ControlNet are implementing standards to extend Ethernet from the enterprise to the control, device and sensor level of the automation information hierarchy and to be compatible with the large base of existing field bus standard data links.

There are several industry organisations concerned with education and the promotion of POF applications. They include the POF Trade Organisation (www.pofto.com), the POF Consortium in Japan, the POF Application Centre at University of Applied Sciences in Nuremberg and POF organisations in the UK, France and Brazil. In addition the 12th International Polymer Optical Fibre Conference 2003 is scheduled for September 14-17, 2003 in Seattle, Washington.

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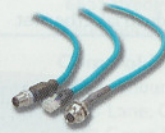
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