

Corporate Technology

For the trade press

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Plastic cable with gigabit data rates

Researchers at Siemens Corporate Technology have set a new record for data transmission in optical polymer fiber cables. Thanks to a new data transmission technique, they have succeeded in sending one gigabit per second down the plastic fibers – ten times more than with products currently on the market. This should finally enable polymer fibers to become established in the home entertainment sector and in factory automation.

Polymer fiber cables enable every layman to set up high-speed data links in their home network. Small converter boxes convert the electrical signal from the copper cable into an optical signal. The thin cables made of plastic that transport the optical signal to receivers anywhere in the home can be easily connected to these boxes. Because of the very high transmission rate of these polymer fiber cables, television signals with high data volumes could also be transmitted within the home in this way in the future.

Up until now, however, polymer fibers have suffered from the crucial disadvantage that their transmission capacity has been limited to 100 megabits (Mbit) per second. Although that is sufficient at the present time for DSL, Internet telephony and Internet TV, experts are certain that one gigabit (1000 Mbit) will be required soon with the rapidly increasing transmission capacity in the Internet. The future for user-friendly, low cost polymer cables therefore looked bleak for a time. But now researchers at Siemens Corporate Technology have broken the sound barrier and set a new record worldwide. Thanks to a new technique for data transmission, they have actually succeeded in transmitting one gigabit per second over a 100 meter long test route in the laboratory –

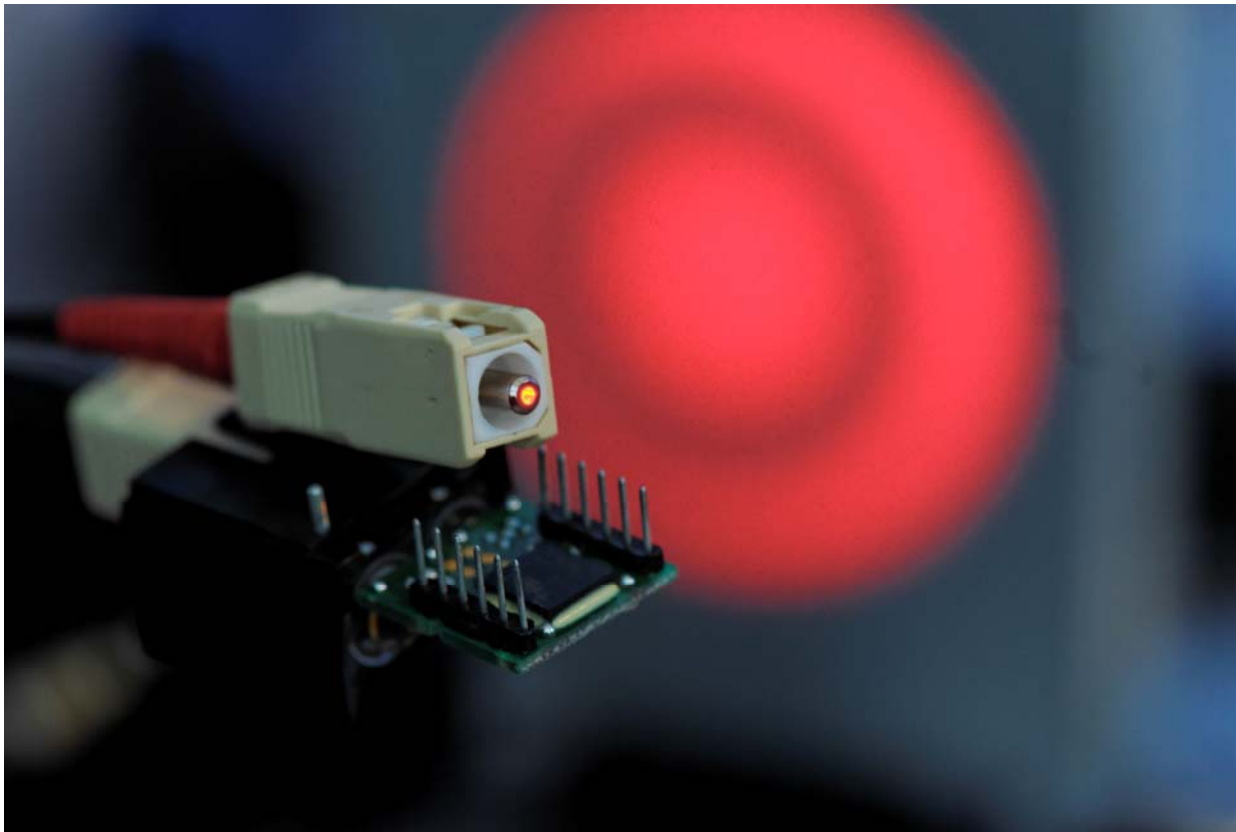
without errors or flickering on the screen. This would be long enough for application in the household.

The trick for getting optical polymer fiber cables to operate at gigabit speeds is that the bits are not sent as usual light pulses as in the past. Instead, the Siemens researchers applied a special algorithm that changes the light signals in such a way that more information fits into the available bandwidth of the polymer fibers. The researchers have adapted the familiar multicarrier modulation technique used in DSL and WLAN so that it is also applicable to light signals. "Thanks to quadrature amplitude modulation with up to 256 signal states, the so-called bandwidth efficiency measured in bits per second and hertz can be increased significantly," explained Sebastian Randel, project manager at Siemens Corporate Technology. Thanks to their algorithm, the researchers could finally transmit exactly 1008 megabits per second through a polymer fiber cable.

This not only makes the polymer fiber suitable for the future in private homes but also especially for industrial automation applications where these rugged, low cost cables have long been established as the standard. They are used to connect machine tools or robots together and to link them to the central control unit. In the same way as in the private sector, ever higher data rates are called for in industry, which is also aiming to attain the gigabit mark. Randel sees even more potential applications for high-speed polymer fibers, for example in the automotive industry, in the controlling of wind turbines, or particularly in medical technology where data volumes are growing at a rapid pace due to the constant increase in the resolution of imaging processes such as computed tomography. Now nothing stands in the way of a successful future for low-cost polymer fiber cables.

A suitable press photo in printable resolution can be accessed online under:

<http://www.siemens.com/ct-picture/ct200706001>



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About Siemens Corporate Technology

In the fiscal year 2005/2006, Siemens invested € 5.7 billion in research and development. Worldwide, almost 50,000 researchers and developers work on the newest technologies. With more than 60,000 current patents, the company is a world leader. Within the corporate department, Corporate Technology (CT), over 2,400 employees work worldwide on key and profile technologies that have a significant role in managerial areas. In addition, CT is responsible within Siemens for global patent management, environmental protection and work with international standardization bodies as well as for the Corporate Information Research Center. Further information about CT is available in the Internet at www.siemens.com/corporate-technology.