

ICT systems: copper cables and fibre optics are indispensable for signal transmission

The wire, cable and wire-processing industry and the wire 2018 trade fair

Ever since the 1980s the term “information society” has been spreading more and more widely and at an increasing speed. It includes the idea of a society that is based on information and communication technology (ICT) permeating every aspect of it. The last 25 years have seen unprecedented technical developments in many areas of our lives.

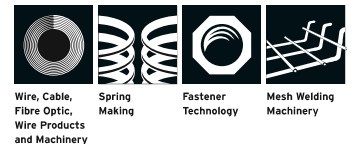
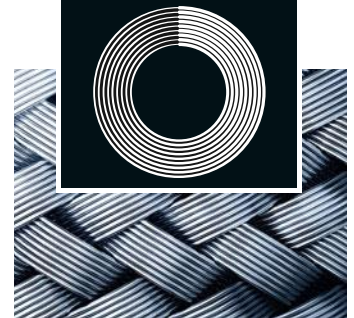
Whether directly or indirectly, the internet plays a major and decisive role in all this. Large volumes of data and signals are transmitted over the internet at high speed and are processed by sophisticated ICT systems. They now allow the remote monitoring of machines and provide control over manufacturing processes – a development summed up under the term “Industry 4.0”.

But the internet also permits the efficient use of electricity from renewable energy sources, with “smart” solutions that help to control and channel the flow of electric power to wherever it is needed. A variety of different ICT systems interact with each other in traffic engineering. Such systems, however, can only function if signals – i.e. carriers of information – are transmitted. And signal transmission is handled either by metallic conductors, usually made from copper, or optical conductors – both products from the cable industry.

In copper conductors the electrical signals are transmitted via electrons, whereas in optical conductors – also known as fibre optics (FO) – this is done by light particles (i.e. photons). Optical conductors are made from quartz glass and a special transparent plastic. Optical cables can transmit more information than copper, have a significantly lower level of attenuation and are insensitive to external electromagnetic impact. By using different frequencies, it is possible to run several independent data channels on a single FO cable. Due to their specific physical properties, metallic and optical conductors each have their own areas of application. One industry that illustrates this point particularly well is automotive

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16 - 20 April 2018 | www.wire.de

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engineering. In recent years there has been an increasing trend of the two worlds – mobility and ICT – to merge and become networked.

More and more electronic systems are being installed in vehicles. They include engine and transmission control, control units for window regulators, central locking and other amenities as well as various safe driving systems and driver assistance systems. More and more vehicles now also have multimedia components and allow drivers and passengers to access and use the internet.

Today's state-of-the-art high-end car has an on-board network comprising far more than 2,000 individual cables with a total length of over 3.5 km (2.2 miles). To save space and weight, cables need to decrease in size – a development which is leading to a growing demand for cables made from alternative materials, such as copper alloys. One important criterion for choosing a conductor material is the data transfer rate. Engine control, for instance, requires immediate transmission, while an air conditioning system does not need to respond to temperature changes in the car within fractions of a second. Whenever large data volumes are transmitted at high speed, often in real time, this is done via fibre optics.

The wire 2018 trade fair

Manufacturers of metallic and optical conductors need special techniques, machines and tools. Up-to-date information on these and other, more general developments in the wire and wire-processing industry can be obtained at the international industry trade fair wire in Düsseldorf from 16 to 20 April 2018.

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