Commercial vehicles are now also being fitted with CAN technology for data transmission yet the cables are often not custom-made for this type of vehicle. The Lapp Group, a manufacturer of cables and connection solutions, plans to provide a remedy with a cable that satisfies all requirements in terms of robustness, fire safety, and flexible applications. Bosch introduced Controller Area Network (CAN) in 1986. This standard has taken root as the central “nervous system” for transferring data to vehicle electronics in cars, and later in commercial vehicles, ever since. Especially in the automation sector CAN is used. Perhaps less well-known is the fact that CAN in mobile applications is not just featured in the vehicle itself but also in its bodies. There is a vast range of potential applications for the CAN network, including bodies for pick-up trucks, panel vans, tank trucks, car carriers, concrete mixers, glass and logging trucks, dump trucks, low loaders, cattle trucks, road sweepers, dustbin lorries, and snow-clearing vehicles.

The cables in a vehicle are extremely long. According to a VDE study, 1 800 m of data cables are tucked away in the BMW 3 Series. And a Claas combine harvester features a staggering 3 000 m of cables in four CAN networks with 350 connectors. FireCAN, a group of 25 manufacturers of fire-fighting equipment, is a supporter of fast mobile data buses. A few years ago, it launched a standardized system for managing electronic applications in fire engines that uses CAN. Its standard connectors enable components made by various manufacturers to be connected in line with the plug and play principle. Nevertheless, a little more attention should have been paid to the cables used to transfer the data as no requirements have been defined for them. So members of FireCAN and the manufacturers of vehicles with other bodies have been using cables that were actually developed for other uses, e.g. automating industrial machinery. Lapp products have also been used here as they are robust, even though they are not designed to handle the specific stresses of fire-fighting equipment.

Specialist not generalist
Standard CAN cables can of course be used for vehicle bodies, and Lapp’s cables, which are renowned for their robust properties, can master this task confidently. But this is not an ideal situation as the requirements for a cable in a factory are different to cables used outside and in vehicles, as is the case with fire fighters and many of the aforementioned vehicle types. There are currently no cables specifically designed for this purpose and no other manufacturer has yet looked into this. This is all the more astonishing as around 250 000 new commercial vehicles are registered every year in Germany alone. German manufacturers of commercial trailers have a market share of around 50 % in Europe. The export share is also around 50 %. As such, there is huge potential for CAN cables in commercial vehicle bodies. Talks between Lapp and potential customers revealed that they would be glad to see cable types adapted to this use. So Lapp came up with the idea of developing their own cable specifically designed for commercial vehicle bodies.

The list of requirements for this cable type is long: it needs to withstand temperatures of -40 °C to +105 °C in line with DIN/ISO 6722 class A+B and it needs to be resistant to oil, petrol, diesel, lubricants, and many other chemicals. As the cable is used outdoors, it needs to be resistant to UV light and weather conditions. As it is also sometimes laid in areas where people are present, certification under ECE R118 (the burning behavior of materials used in interior construction) is mandatory. According to this regulation, the sheath material must be halogen-free so that, in the event of a fire, a person’s airways are not chemically burnt when the blazing plastic comes into contact with extinguishing water. As a result, only a sheath made of special polyurethane can be used here.
Lapp was able to build on its expertise when it developed the Unitronic CAN cable. Its portfolio already included cables for various uses in commercial vehicles, for instance:

- Ölflex Truck for the electrical wiring in truck trailers, which is also approved for hazardous materials transportation as a result of the special ADR approval. The cable features an outer sheath made of either special PVC or special PUR. The latter is also microbe resistant;
- Etherline Heat 6722 is designed for data transmission inside buses, e.g. security cameras or entertainment systems in luxury coaches. The cable is halogen-free, flame retardant and tested in line with the ECE R118 standard;
- Unitronic Bus IS is an Isobus cable that complies with ISO 11783-2. It is based on the CAN standard and is used to transfer data in agricultural vehicles.

Specialized cables for CAN

Unitronic Heat 6722 is now the fourth cable in this group. It features the aforementioned properties, in particular the temperature range and robustness to all possible chemicals, and is certified in line with ECE R118. To a certain extent, it is a combination of the excellent features of the three existing cables. But the smaller diameter and thus lower weight is new. The outer diameter of the Unitronic Heat 6722 is 2.4 times the diameter of the four individual cores within this cable, making it 40% thinner than conventional cables. The Lapp engineers managed to achieve this by forming a star quad, also known as a twisted quad, in the cable. According to experts, this means a cable with four cores where the opposite cores are twisted together. This saves space and weight and allows for narrow bending radii. The cable has a highly flexible sheath and fine-wired strands, so it is ideal for installation in moving applications, e.g. a drag chain in an extendible fire ladder.