CAN technology trends in 2026 and beyond

CAN is a mature communication technology comprising three data link layer protocol generations: CAN CC (classic), CAN FD (flexible data rate), and CAN XL (extended data field length). There are still improvements and new functions developed, especially for CAN-based higher-layer protocols. On the following pages, there are several statements reported, providing near-future CAN technology trends.

(Source: Adobe Stock)

CAN FD light applications

The future of automotive E/E-architectures is zonal. This expectation is mainly voiced in the context of Ethernet-based network architectures. In an Ethernet-based zonal architecture the computation power is located in the central electronic control unit (ECU) and in zonal gateways. The communication from these control units to small sensors and actuators requires a cost-efficient network solution that enables these smaller devices to operate without microcontrollers and software.

CAN FD light with its cost-efficiency and its capability to be implemented in small monolithic devices without the need for software, microcontrollers, and expensive additional external components like crystals offers a solution to this requirement.

Today's CAN-based body network shows a collection of applications, which are candidates for such low-cost connection needs.

Figure 1 shows a simplified representation of a CAN-based body network and attached applications. Additional functions such as interior lighting or climate control may be added. Some of these functions are optional like the control for the sunroof.

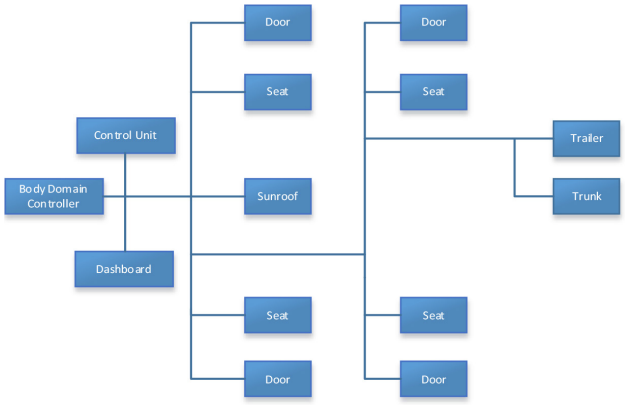

Figure 1: Simplified body CAN (Source: Fred Rennig)

The sunroof is an example of a small control unit with safety requirements since a closing roof may cause harm by squeezing body parts in its way. Similar safety requirements apply for automatic window and door closures or heating. Window lift or lighting require an ASIL-B capable communication according to ISO 26262. CAN FD light in conjunction with its end-to-end communication safety protection enhancement offers a fitting solution for these components.

Exterior lighting is an example, in which many small light actuators need to be controlled over a single network since the light (LED) drivers must be placed close to the light source, but must be connected to a zonal controller.

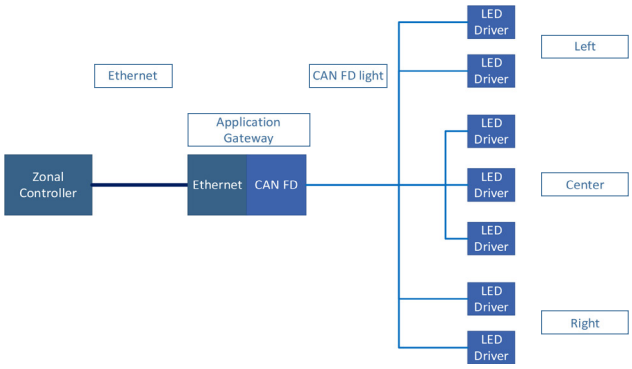

Figure 2: Lighting example with distributed drivers and Ethernet gateway (Source: Fred Rennig)

Figure 2 shows a lighting application with many distributed LED drivers that are connected by CAN FD light to an application gateway. The application gateway communicates with the zonal controller via Ethernet.

This application example displays the advantages of CAN FD light over other networks used in the automotive domain. It can connect up to 100 single nodes to a commander at low cost by implementing a full monolithic integration inside the LED drivers without the need for an external crystal.

Since CAN FD light can be used in a daisy-chain configuration which allows auto addressing, it is also a good choice for interior lighting.

Other applications are the ones currently connected by LIN. Many LIN networks in the car need an upgrade to higher data rate and the network consolidation that is enabled by doing so. Also, here the low implementation and network cost together with a large amount of individual responder nodes that can be connected with CAN FD light makes it the right choice for this network improvement and consolidation.

"CAN FD light is due its low cost and backward compatibility to CAN FD the perfect candidate for climate control actuators ('HVAC' – heating, ventilation and air-conditioning) with its heaters and ventilation motors.

Fred Rennig (STMicroeletronics, EMEA ADG Marketing and Application)

With these advantages and properties of CAN FD light in mind many additional applications can be imagined for this µC-less cost-efficient and backward compatible network protocol."