



Connecting Systems with Solutions

Ethernet Tunneling as an Enabler of Next-Generation Technologies

01/2024



ERICH JAEGER

Introduction	3
Technological Transformation in Trucking Industry	3
The Role of Ethernet	3
Ethernet Advantages for Fleets	3
Ethernet Tunneling Supports CAN and LIN Networks	4
Conclusion	4

Introduction

As the trucking industry undergoes a technological transformation, ERICH JAEGER offers insights into how the Ethernet, particularly 1000BaseT1, serves as the foundation for technological innovations. As a leader in electrical connection systems and a member of the TMC's S1 Next Generation Tractor/Trailer Interface Task Force, we want to inform the industry of the vital importance the Ethernet has for current and future truck and trailer innovations and technologies.

Technological Transformation in Trucking Industry

Many of the technologies, initially seen in passenger vehicles, are on the cusp of becoming integral features in Class 6-8 trucks – and vice versa. Whether the implementation of new technologies is due to convenience, economics, safety or legal reasons, major changes affecting both the trucks and the trailers are coming. As we work on developing the next generation trailer tow connector, which will work side by side with the existing SAE J560 connector, we focus on the following advanced technologies:

- **Advanced Driver Assistance Systems (ADAS)**
- **Autonomous Driving**
- **Electric Powertrains**
- **Predictive Maintenance**
- **Smart Navigation Systems**
- **Enhanced Safety Features**
- **Real-Time Load Monitoring**
- **Connected Fleet Management**
- **Internet of Things (IoT) Integration**
- **Telematics**
- **Vehicle-to-Everything (V2X) Communication**
- **Over-The-Air Updates**

Each of these technologies requires a robust, reliable, proven and high-speed data transmission channel, which 1000BaseT1 Ethernet impeccably provides.

The Role of Ethernet

Ethernet has been the standard in data communication since the 1980s, meeting the high-speed data transfer needs of multiple industries. The 1000BaseT1 Ethernet standard has a particular significance for trucks and trailers. It offers up to 1 Gbps data rate and allows devices to seamlessly integrate with cloud services and IoT devices. These features open up endless possibilities for enhancing the vehicle capabilities and real-time communications with external networks.

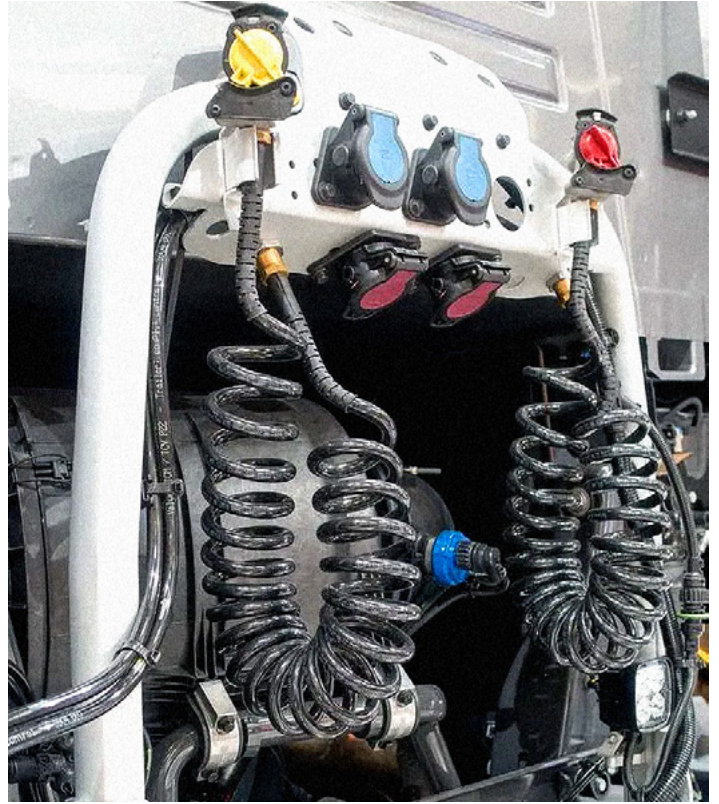


Ethernet Advantages for Fleets

- **High-Speed Data Transfer:**
Essential for real-time applications like ADAS and autonomous driving;
- **Flexibility:**
Streamlines integration with cloud services and IoT devices, increasing external network communication capabilities;
- **Reduced Complexity:**
A single Ethernet cable can easily replace multiple CAN and LIN links, which simplifies the internal wiring network;
- **Scalability:**
Designed to easily integrate the upcoming technologies, offering a future-proof communication network solution.

Ethernet Tunneling Supports CAN and LIN Networks

Many fleet operators are concerned about the need to replace the existing CAN and LIN technology when transitioning to the Ethernet architecture and technologies. While CAN and LIN may be slower than Ethernet, they are still widely used and are very useful in many trucking applications that do not require the near-instant response time or high-speed data transmission rates. Ethernet tunneling allows the users to continue using CAN and LIN networks where applicable and transferring (tunneling) the CAN / LIN signals over the Ethernet channel (i.e. Ethernet Tunneling). Doing so simplifies the vehicle architecture and network, helping the fleets to save on weight, cost and complexity of the vehicles.



Conclusion

Integration of 1000BaseT1 Ethernet is not a mere technological upgrade, but it is a strategic and necessary technology for all modern trucks and trailers. It facilitates the seamless integration of upcoming next-generation technologies and offers backward compatibility for existing communication protocols.

For more detailed insights and information, please contact our team of experts. We look forward to hearing from you!





ERICH JAEGER

Erich Jaeger USA Inc.

17199 North Laurel Park Dr
Suite 105
48152 Livonia, MI, USA

Phone: + 1 734 404 5940
sales-usa@erich-jaeger.com
www.erich-jaeger-usa.com

Erich Jaeger GmbH & Co. KG

Straßheimer Straße 10
61169 Friedberg
Germany

Phone: +49 (0) 6031 7940
info@erich-jaeger.de
www.erich-jaeger.com