

# Solutions

## for moving applications



### Railcar jumper systems

Our railcar jumper systems are designed for areas between vehicles in bogies subjected to high mechanical stress, and are developed for each individual installation situation.

Railcar jumper systems can be designed as a roof or under-floor jumper system between the face ends of the carriage bodies. For the cable construction, consisting of power, control data bus, fiber optic and/or coaxial cables, as well as the design of the mechanical mounting and cable routing, LEONI can draw on its extensive experience to solve even the most complex kinds of problems.

Due to rising expectations from passengers about service quality in relation to information and availability, requirements for data communication in rolling stock will continue to grow more challenging.

As a system provider, we need to constantly improve performance in developing new products that guarantee the reliable transmission of data even between carriage bodies – a flexible, constantly moving application scenario.

#### Railcar jumper systems for rolling stock

##### Future requirements:

- **Development of railcar jumper systems**

During the development of new railcar jumper systems, we ensure the optimal integration of data transmission requirements into the hybrid cables and plug-in connectors designed specifically for the application.

- **Development of individual data jumpers**

Data jumpers are individual breakout cables that are integrated into complete railcar jumper systems or can be installed as individual jumpers. This means they can be deployed both in new vehicles and for refurbishment or retrofit projects.

- **Refurbishment and redesign**

Where railcar jumper systems are already in use with existing fleets of rolling stock, we can refurbish, modernise and redesign these systems to handle the advanced requirements for data communications.

- **Retrofit**

If the railcar jumper systems present are still readily usable, these can be retrofitted with data jumpers without any intervention into the existing system.

# LEONI

- **LEONI system solution**
- Mechanical and electrical design plus overall system architecture
- Cable design and engineering
- Material development
- Interface design, plus connector optimisation/modification
- Product qualification and QA with endurance testing (e.g. at extreme temperatures)
- Overall system with e.g. EN45545-2 fire prevention certification
- Project planning
- Lifecycle cost optimisation

Details often make the difference in product performance and safety. Special solutions from LEONI are a perfect match for the functionality needed by your application – regardless of whether you need an entirely new product or only a retrofit.

| Data lines in jumper cables / systems                        |  |
|--|--|
| Cable type   | Properties   |
| <p><b>Coax cable 50 Ω*</b></p> <p><b>Coax cable 75 Ω</b></p> | <ul style="list-style-type: none"> <li>■ Complies with EN 45545-2</li> <li>■ Compatible with all typical rail RF connectors</li> <li>■ Assembly optimised for moving applications</li> <li>■ Optimal transmission to 3 (6) GHz</li> <li>■ Attenuation-optimised</li> </ul>                 |
| <b>Cat 7A</b>  | <ul style="list-style-type: none"> <li>■ Complies with EN 45545-2</li> <li>■ CAT 7A-ready all-in-one system for moving applications</li> <li>■ Assembly optimised for moving applications</li> <li>■ &gt;1000 MHz</li> <li>■ Data transmission rate &gt;10 GBit/s optical fiber</li> </ul> |
| <b>FO</b>  | <ul style="list-style-type: none"> <li>■ Complies with EN 45545-2</li> <li>■ OM3 multimode</li> <li>■ Assembly optimised for moving applications</li> <li>■ Bend-optimised fibers</li> <li>■ Data transmission rate &gt;10 GBit/s</li> </ul>   |
| <b>Hybrid data jumper</b>                                    | <ul style="list-style-type: none"> <li>■ Complies with EN 45545-2</li> <li>■ 2x CAT 7A and 2x duplex optical fiber</li> <li>■ Assembly optimised for moving applications</li> </ul>  |
| <b>Hybrid jumper</b>   | <ul style="list-style-type: none"> <li>■ Complies with EN 45545-2</li> <li>■ Customer-specific design</li> <li>■ Assembly optimised for moving applications</li> </ul>   |

\* Coax cable also available in other designs on request



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