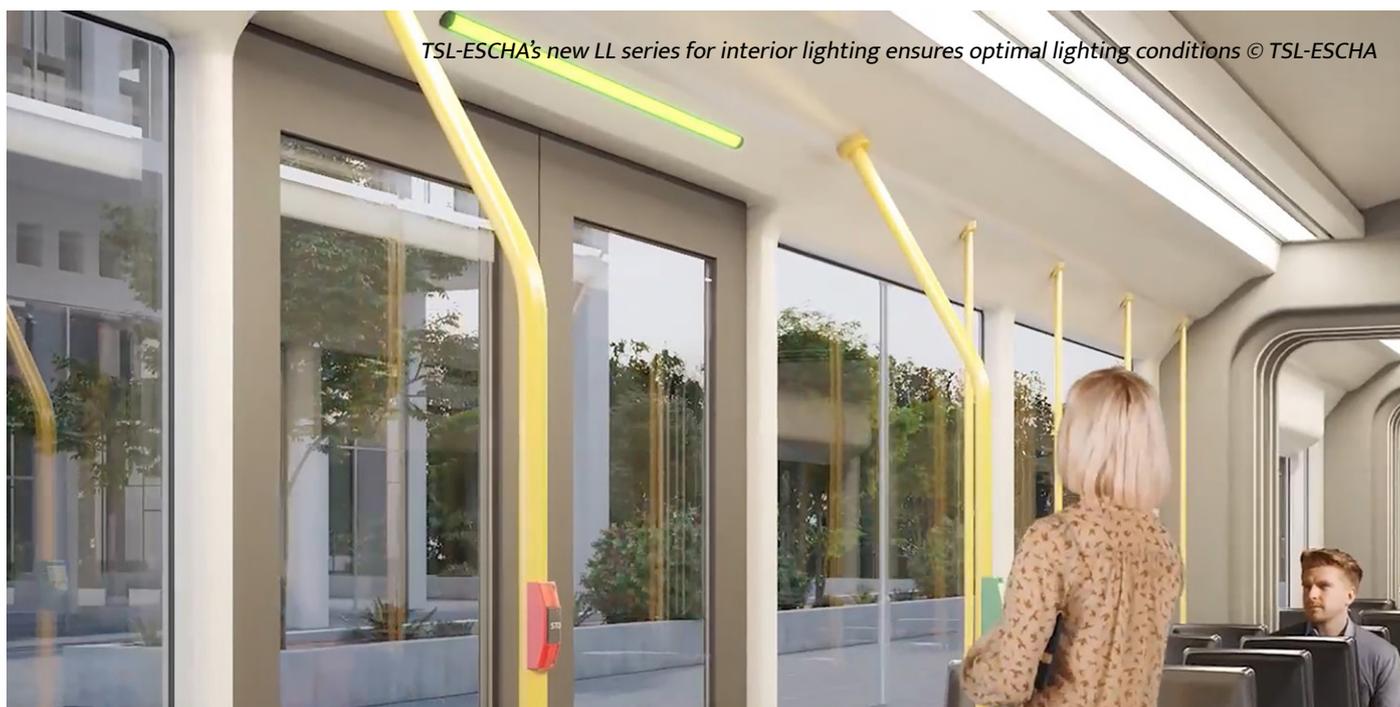


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# TSL-ESCHA

## A New Universal Lighting Concept for Railway Vehicles



*TSL-ESCHA's new LL series for interior lighting ensures optimal lighting conditions © TSL-ESCHA*

**T**he new ceiling lighting series LL by TSL-ESCHA is a long-term, versatile and expandable solution. It offers an individual lighting concept and an intelligent luminaire system for easy and predictive maintenance.

Light can have a calming and relaxing effect. This is an enormous advantage in the often hectic everyday life of public transportation. Accordingly, more and more operators are relying on an intelligent lighting system. This means greater comfort for passengers but also optimum safety. A smart lighting system also

offers added value for the vehicle manufacturer. Because who doesn't want a product that is maintenance-free, durable and reliable? In addition, it can withstand continuous loads for many years and at the same time reduce ongoing operating costs. TSL-ESCHA has developed the perfect solution for LED ceiling lighting for rail

vehicles with the new Linear Light Series LL.

TSL-ESCHA has over 35 years of experience in the development and production of push buttons, signal lights, warning sounders and indicator devices for road and rail vehicles. With the new LL series, TSL-ESCHA now offers a universal, innovative and intelligent lighting concept for ceiling lighting in trains. Fixed light colours or colours adapted to the respective situation from warm white to cold white light (from 3,000K to 6,500K) can be realised. A homogeneous light without transitions can be achieved over the entire length of the vehicle with the LL series.

The advantage of the linear light series is its simple and intelligent wiring. This makes the system a cost-effective option that is also easy to assemble. Each printed circuit board can be individually adjusted in terms of brightness and light colour. This makes it easy to implement individual customer requirements. The same applies to compliance with standards such

as for electronic equipment (EN 50155), photometric requirements (EN 13272-2) and fire protection (EN 45545-2 up to Hazard Level 3). The linear lights can be connected to the existing communication system of the vehicle, as it is gateway-capable. This enables higher-level control. This is done via Ethernet or CAN bus, which are frequently used in the rail industry. By analysing and evaluating the collected data, correct maintenance work can be carried out, suitable spare parts can be provided, and the downtime can be kept as short as possible. The magic word in this area is predictive maintenance.

The new LL system is already in use in trams in the Czech Republic. In this project, TSL-ESCHA installed the linear lights directly in a profile designed by the vehicle manufacturer and delivered this ready for installation. For the customer it was then only a matter of mounting, plugging together, diffuser on top, ready to go! The light colour according to individual customer requirements

was already set in advance at the TSL factory. On site at the vehicle manufacturer, it was then possible to make a simple adjustment of the brightness in the installed state. This is how modern lighting technology works. It makes things easy for the vehicle operator and ensures that passengers feel even safer and more comfortable.

### Product Highlights of the LL Series:

- Intelligent and individual lighting solution
- Variable light lengths allow installation in any vehicle
- Subsequent parameterisation possible, as each printed circuit board is individually adjustable in terms of brightness and light colour
- Cost and time savings during maintenance
- Predictive planning of



repairs possible (predictive maintenance)

- Plug-&-play system components – from diffusers to profiles
- The LL system is a cost-effective variant that already has a basic intelligence. This can be upgraded by a gateway as a high-end variant
- Long-lasting and expandable solution
- Networking of the different systems enables higher-level control and monitoring (Railway 4.0)

For more information, visit [www.tsl-escha.com](http://www.tsl-escha.com) or call the TSL-ESCHA team at +492353-667960.



The LL series can be variably adapted in length for each vehicle © TSL-ESCHA

The linear lights can be individually adapted to any customer requirement in terms of color temperature and brightness © TSL-ESCHA

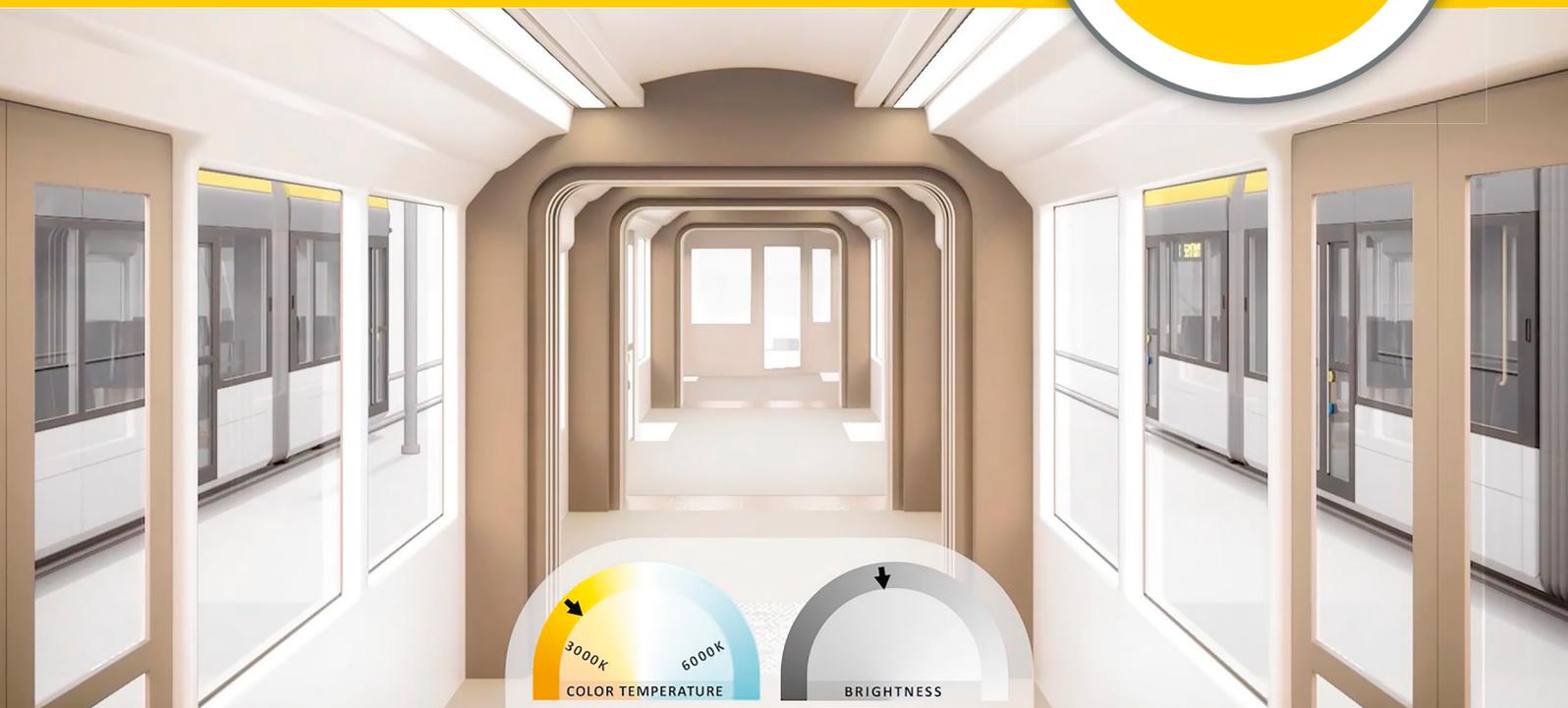


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# Lighting for the Present and the Future

## Ceiling Lighting LL Series is a Long-Term and Expandable Solution



NEW LINEAR-LIGHT SERIES LL FOR PUBLIC TRANSPORTATION