TUNNEL
LIGHTING CONTROL

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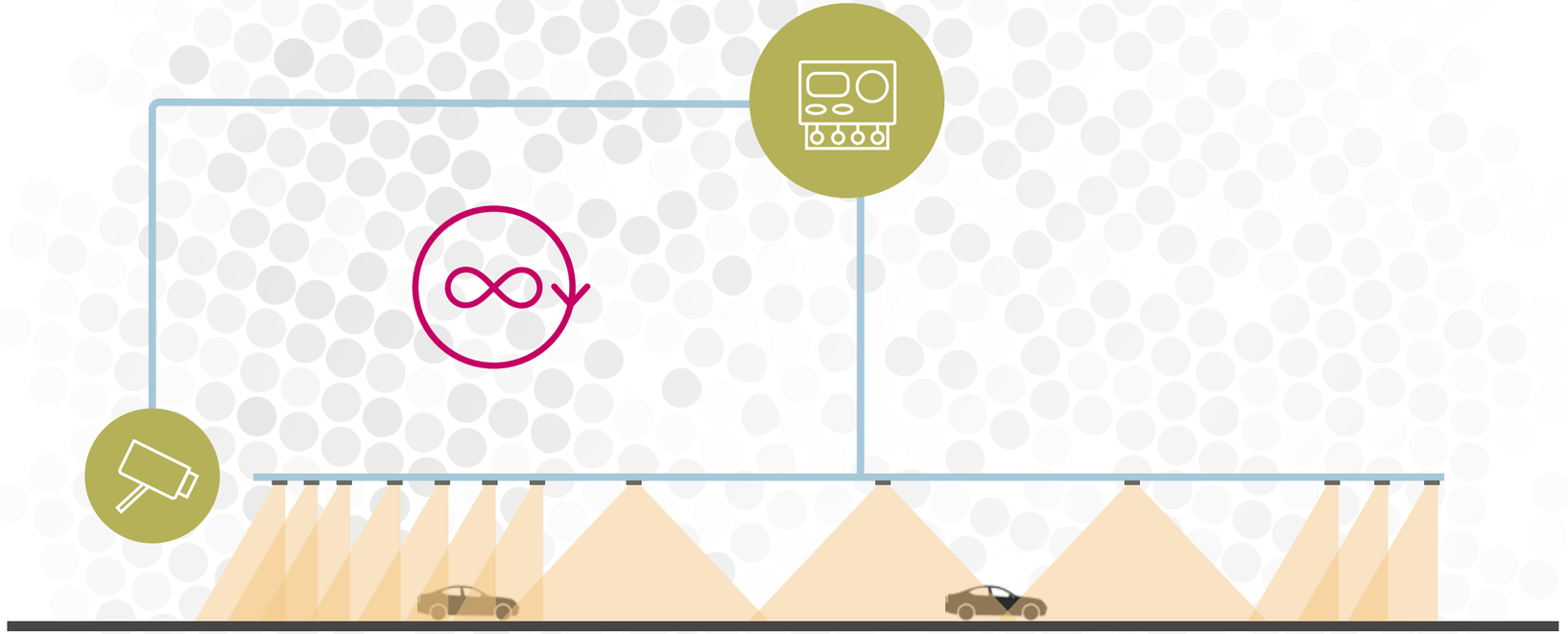

Reliable
Easy commissioning
Communication interface options

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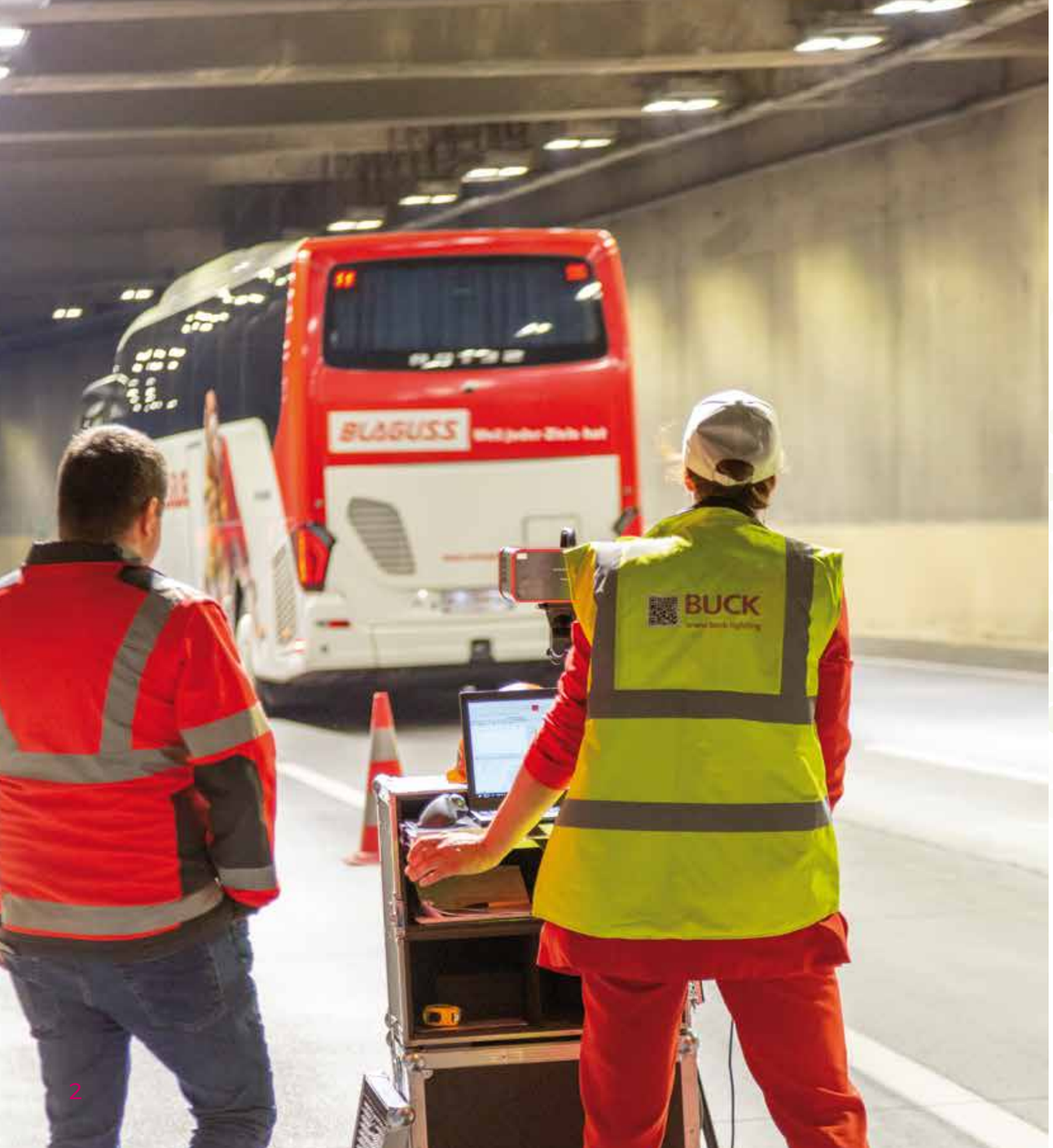


TUNNEL LIGHTING CONTROL

While driving through tunnel,
lighting is all about your
priceless safety.

Appropriate lighting scenario is essential for tunnel traffic safety. Lighting setup is achieved with a dedicated control system.
Buck offers several types of closed loop tunnel lighting control systems that are easy for commissioning and very reliable.
Those can be integrated into third-party central control or used with Buck's tunnel complete control system with SCADA for regional monitoring centers.

BUCK TCC: TUNNEL COMPLETE CONTROL SYSTEM

SCADA
central system for real-time monitoring and control of regional traffic tunnels

TCA : Tunnel Control Agregator
Industrial PC
for aggregating control over complete tunnel and execution of emergency scenarios due to incidents, e.g., fire, CO levels, traffic accident, SOS phone, power failure...

TLC : Tunnel Local Control
Industrial PLC
with communication interfaces for local control and execution in the tunnel section

Industrial Hi-Speed Ethernet Optical Network
for connecting tunnels with regional command center

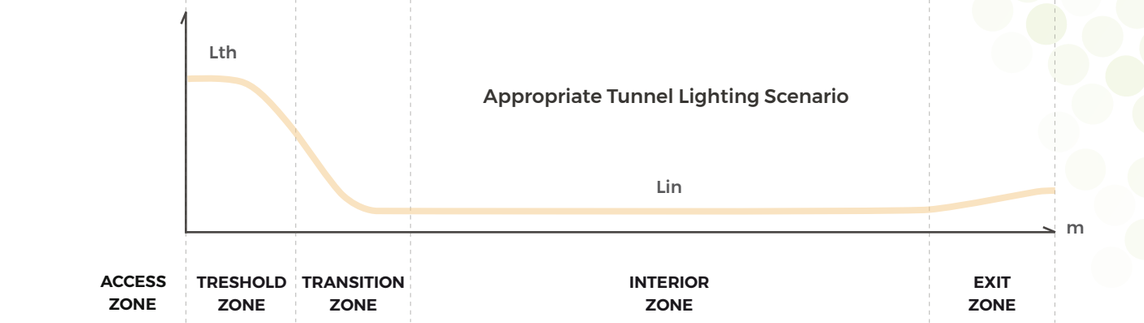
Industrial network
for tunnel equipment

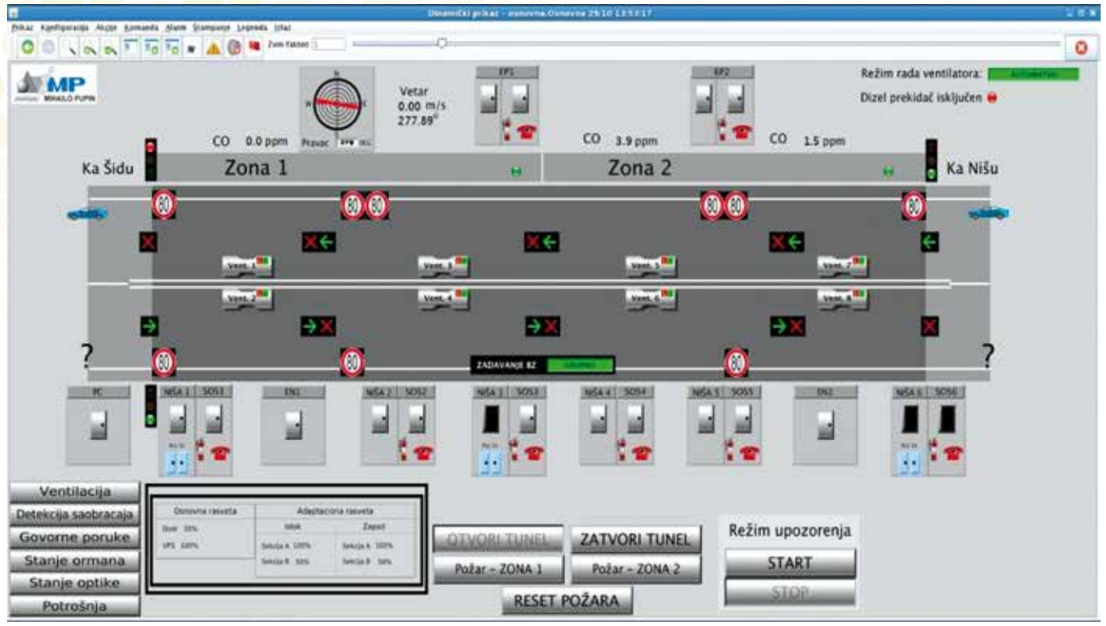
L20

Lighting control interface:

- RSi as digital bidirectional RS-485 interface (addressable luminaires with feedback);
- SDi as discrete time coded 230 V step dim interface (no feedback);
- CLi as analogue current loop 4-20 mA interface (no feedback).

L20, Lth, Lin: Luminance meters as lighting control feedback.





BUCK TUNNEL SCADA

Comprehensive dedicated SCADA (Supervisory Control And Data Acquisition) solution for management of traffic tunnels provides real-time data presentation and easy execution of complex control functions using specialized dialogs.

Buck tunnel SCADA integrates the following subsystems:

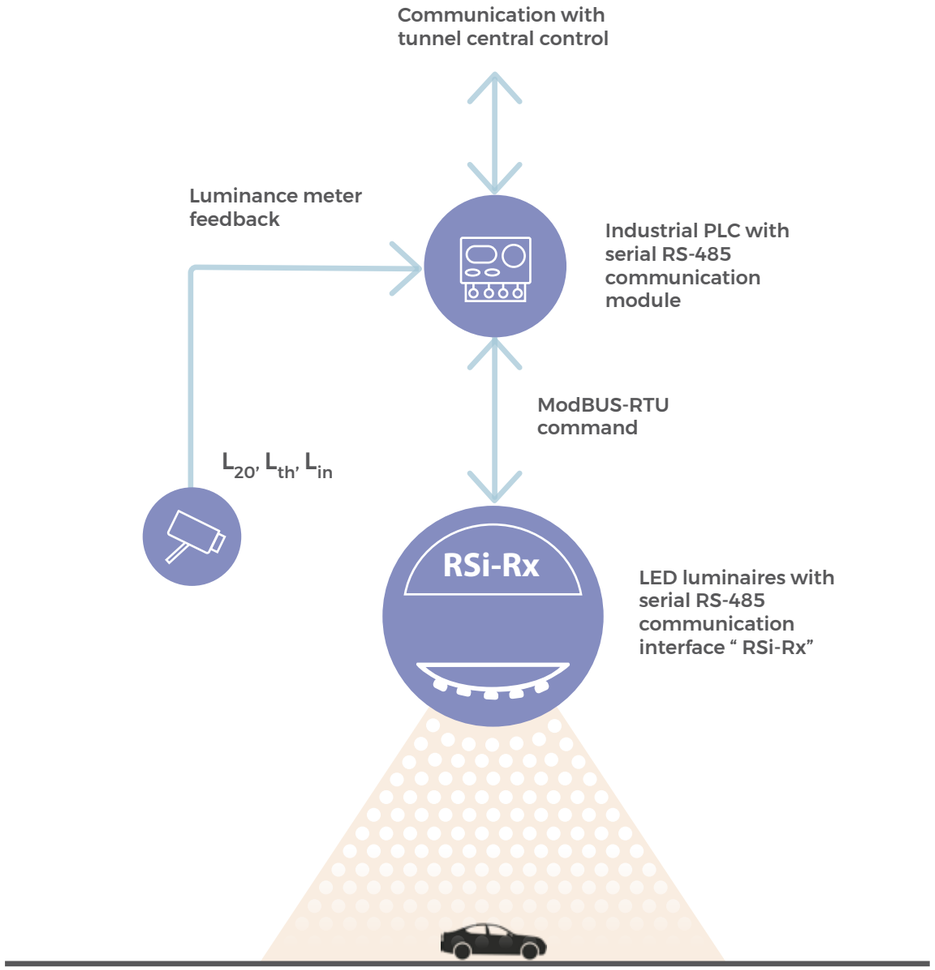
- Fire Alert System
- Burglar Alert System
- Video Surveillance System
- Intercom Communication System
- Air Control System
- Trac Detection System
- Audio System
- Radio Link System
- Trac Signalization Control System
- Tunnel Lighting
- Ventilation
- Operating Command Center
- Hydrant

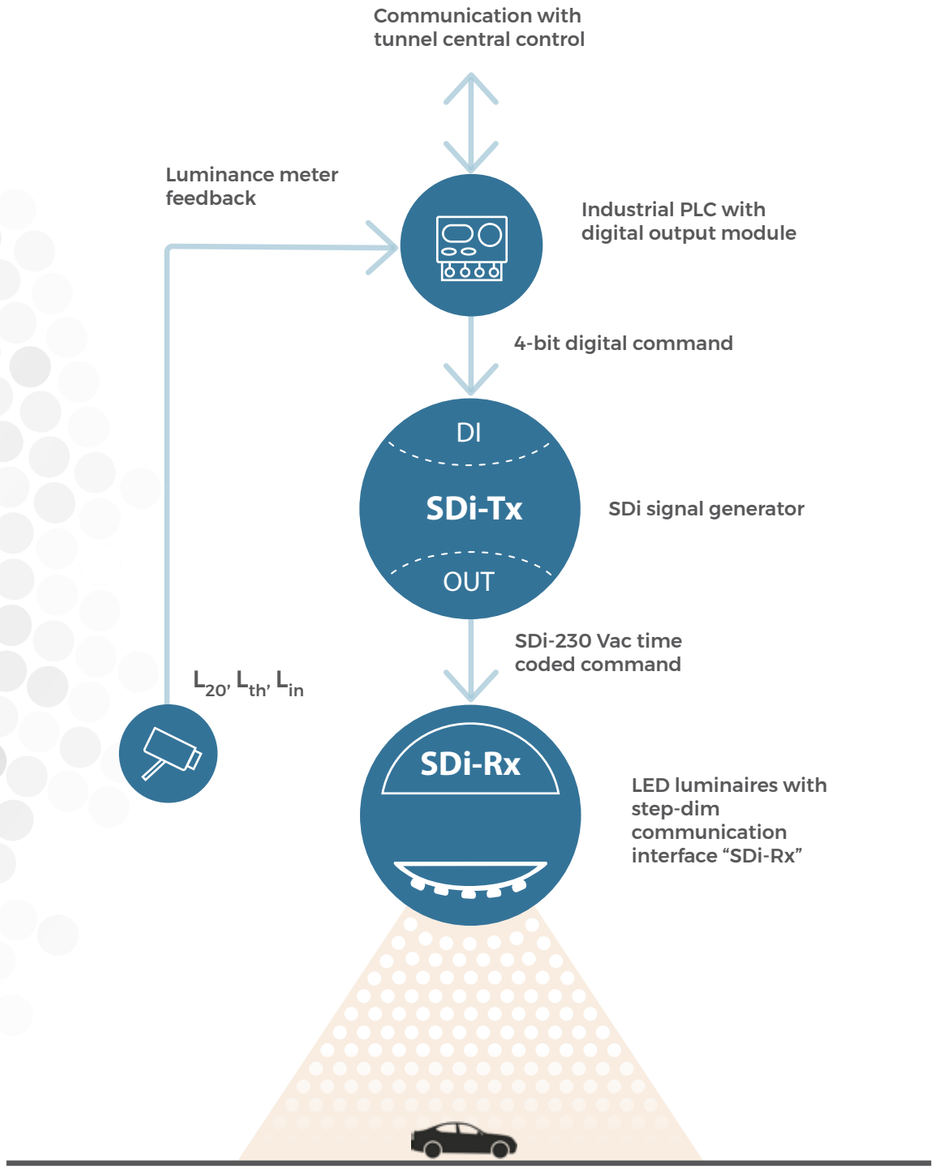
RSi - TUNNEL LIGHTING CONTROL

RSi (RS-485 interface) tunnel luminaires digital bidirectional control signal interface.

Communication is done via Modbus-RTU protocol, so that luminaires are individually addressable and able to receive commands and respond to queries. Basic user commands are: ON/OFF, dimming level, dim UP/DOWN; and queries are: failure detection, power ON time, power level, etc.

In order to have a stable communication wiring should be done properly with LSZH twisted pair screened cable in max. 1200 m length and max. 240 luminaires connected to one line.





SDi - TUNNEL LIGHTING CONTROL

SDi (step-dim interface) tunnel luminaires control interface is ideal for refurbishment of road tunnels, since it saves time and wiring material by using existing cabling and is easy to install.

The system consists of control signal transmitter (SDi-Tx) and control signal receiver (SDi-Rx). Transmitter receives 4-bit 24 Vdc digital signal and converts it to 230Vac time-coded control signal. The coded 230Vac signal goes to the Receivers in the luminaires and gives appropriate power level command.

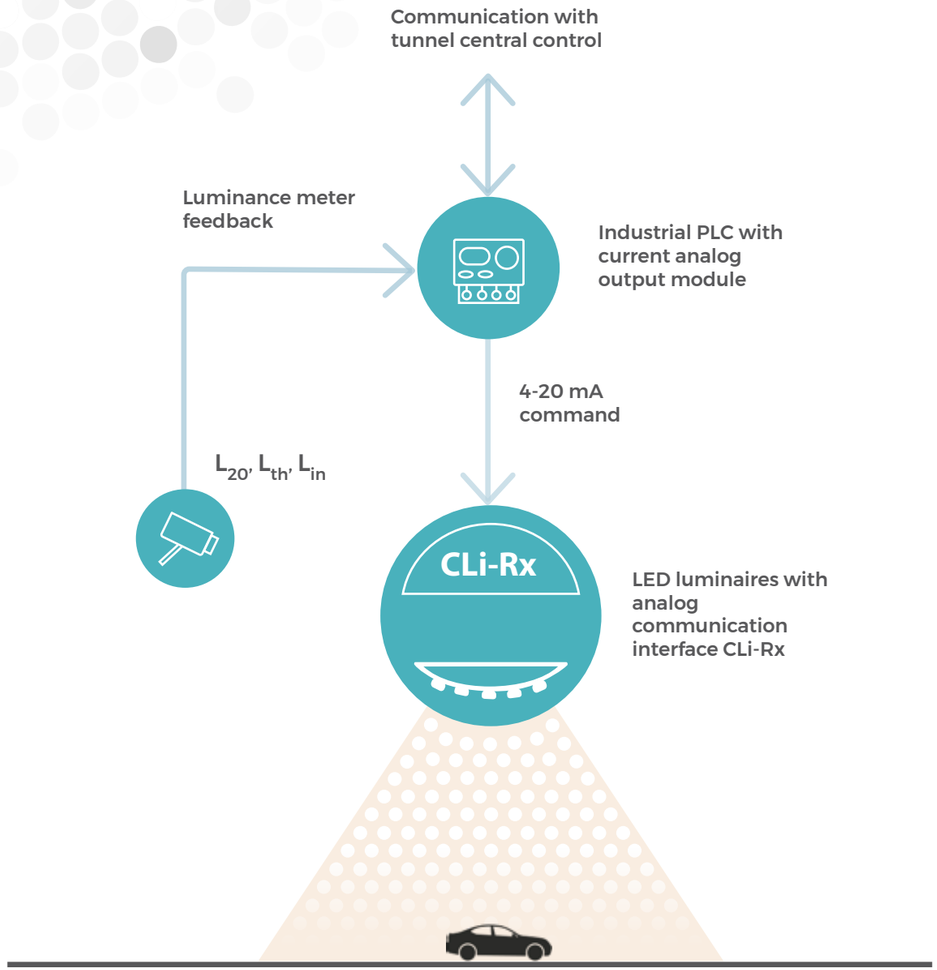
The transmitter is equipped with 8 channels, so it is able to simultaneously generate 8 same control signals.

System is very robust since there can be no interferences, signal line can be kilometers in length and have 100 luminaires connected on one line. SDi-Tx failure detection (error out) is incorporated in two levels; one is a fatal error when power is down, and the other is an output self-test, which detects if any output channel is broken.

CLi - TUNNEL LIGHTING CONTROL

CLi (current loop interface 4-20 mA) tunnel luminaires current loop control signal receiver.

- Analog 4-20 mA control signal goes to the Receivers and gives appropriate luminaire power level command.
- There are two possible interfaces to the driver: digital Dali or analog 1-10V.
- Resolution of the device is 0,1 mA; so we get approximately constant linear dimming effect.
- Minimum possible dimming level of the led luminaire is 10% which is shown on the I/O diagram below.
- Max. voltage drop on one Rx device is 0,2 V - to calculate the possible number of devices at the loop line.
- Wiring cross-section 0,5 ÷ 1,5 mm 2



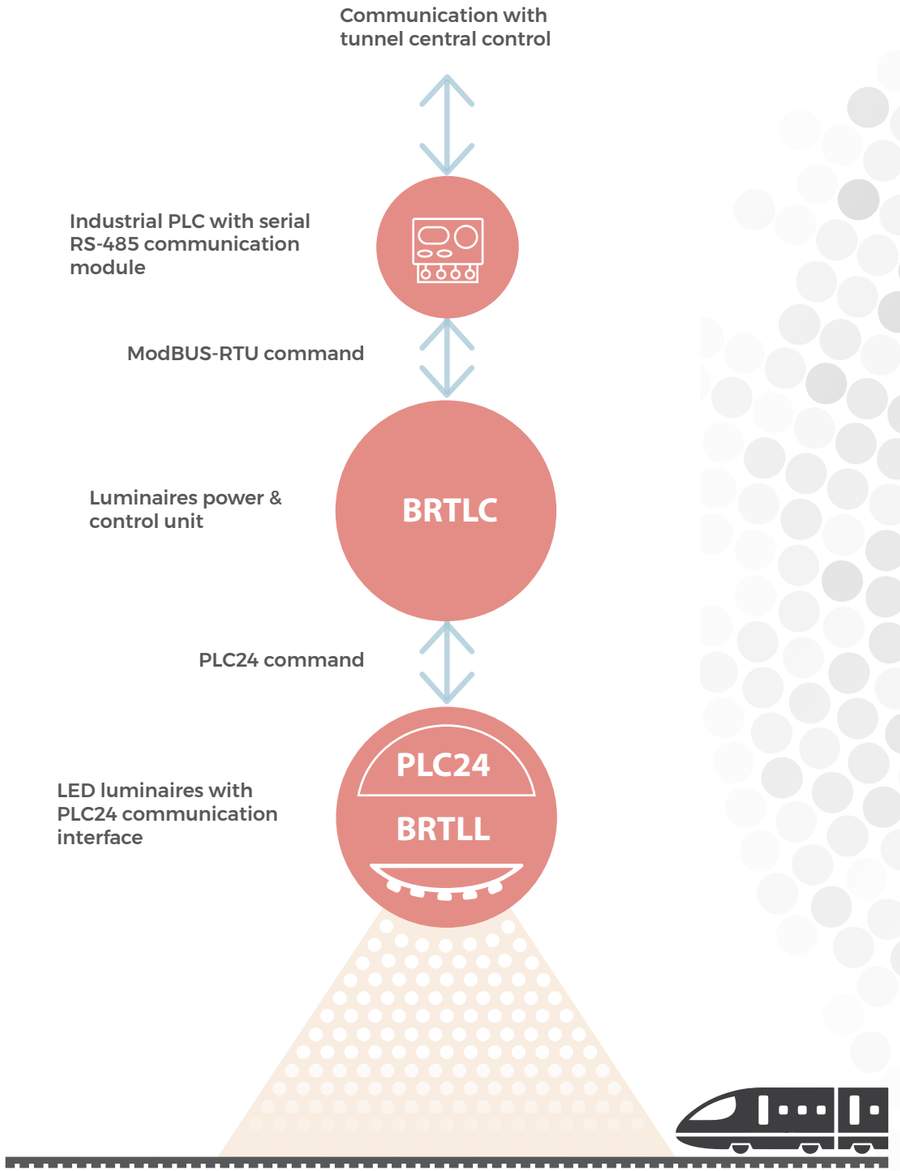
BRTLS

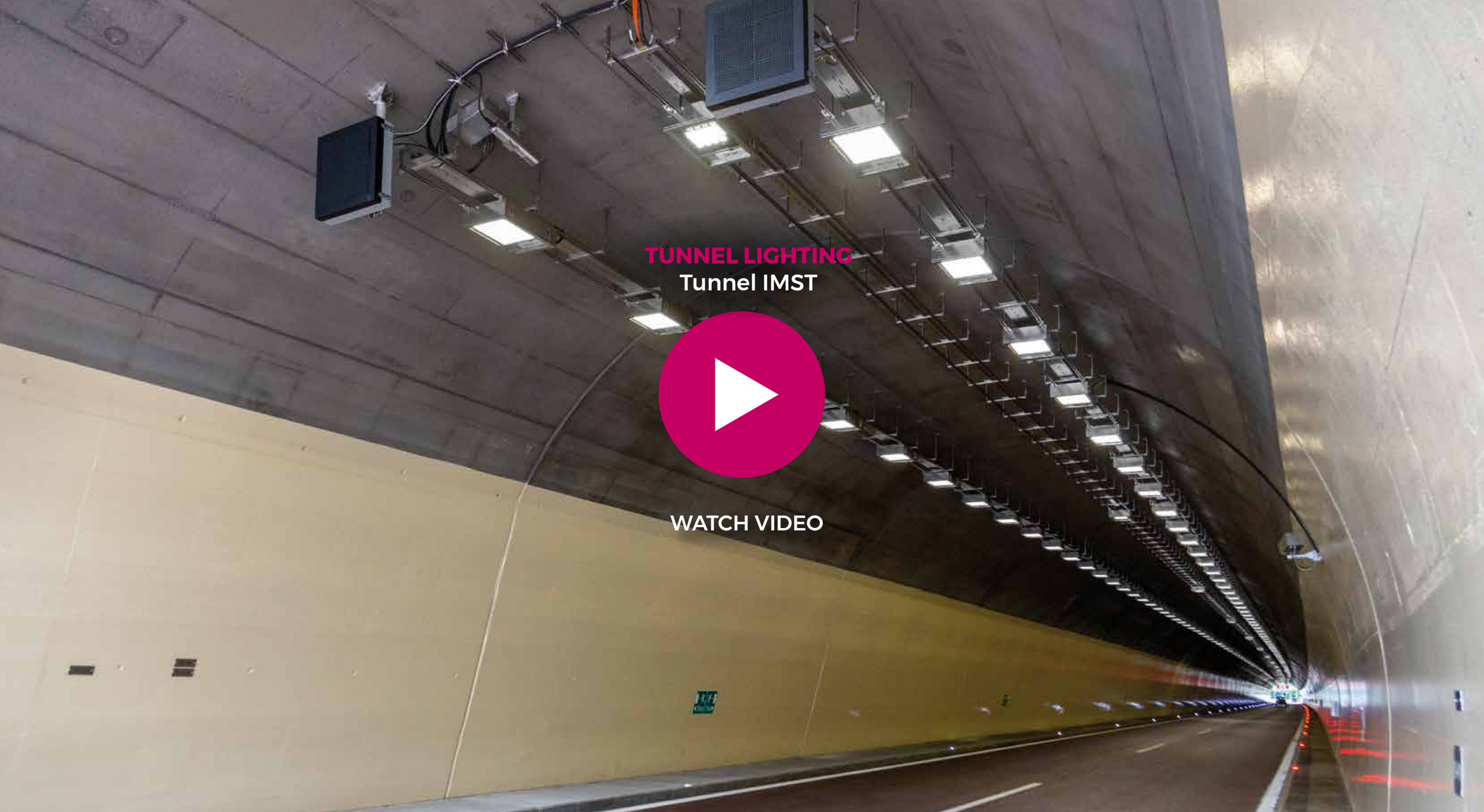
BRTLS (Buck Railway Tunnel Lighting System) is a power supply and control system for railway tunnel lighting. This includes the lighting of evacuation paths, evacuation signs on walls and portals of evacuation niches. The system (BRTLS) consists of LED luminaires (BRTLL) and power control units (BRTLC).

Luminaires are integrated into stainless steel or pultruded glass fiber-reinforced polyester handrail system designed especially for railway tunnels.

Communication between luminaires and controller is digital bidirectional PLC – Power Line Communication that enables luminaires addressing and failure reporting.

Components of the system are protected to withstand the harsh environment of railway tunnels that includes EM interference, ambient temperature from -25˚C to +40˚C, max Rh 85% and impurities - particles from train brakes and carbon abrasion from the electrical network.

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Tunnel IMST
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