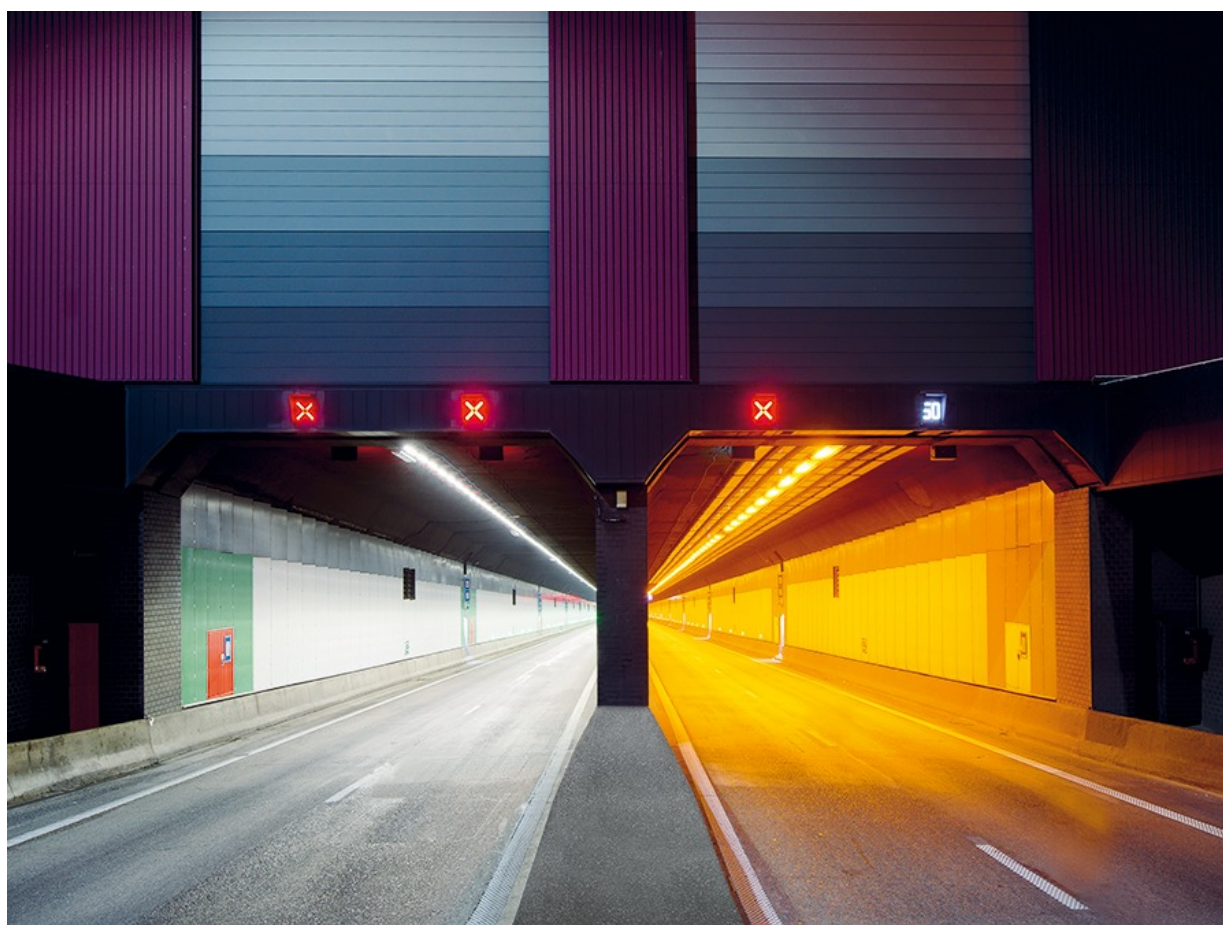


# Intelligent LED lighting solutions for tunnels and subways



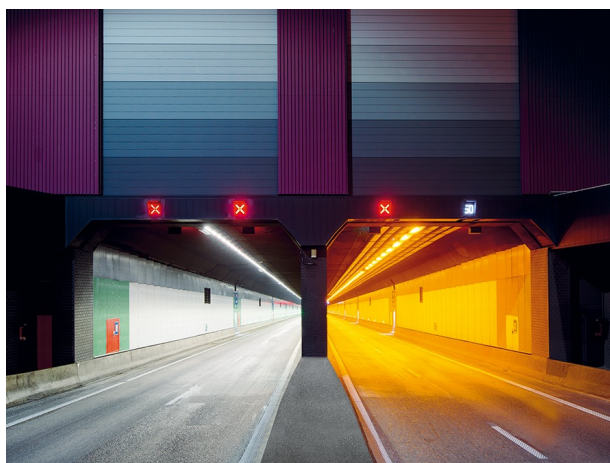
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# Intelligent LED lighting solutions for tunnels and subways

## Overview

- Installation companies, operators, and planners of lighting systems are faced with the challenge of creating consistent lighting solutions for tunnels that meet the applicable specifications and controlling the intensity of the light to suit the prevailing situation.
- Together with its Belgian cooperation partner, Schröder, Phoenix Contact offers ready-to-install lighting solutions that can be integrated into a control system via the Ethernet network.
- The control cabinets and application software are pre-programmed and are easy to configure and network.



LED lighting solutions for tunnels offer numerous advantages

## Application

Tunnels are technically demanding constructions. In addition to the large number of existing tunnels, the number of new installations is on the rise. This means that the most diverse range of lighting solutions are in operation at the same time.

In addition to the old lighting technology, sophisticated LED technology is being used more and more. There are also tunnels that have had parts retrofitted, which means that they feature a combination of old and new lighting technology.



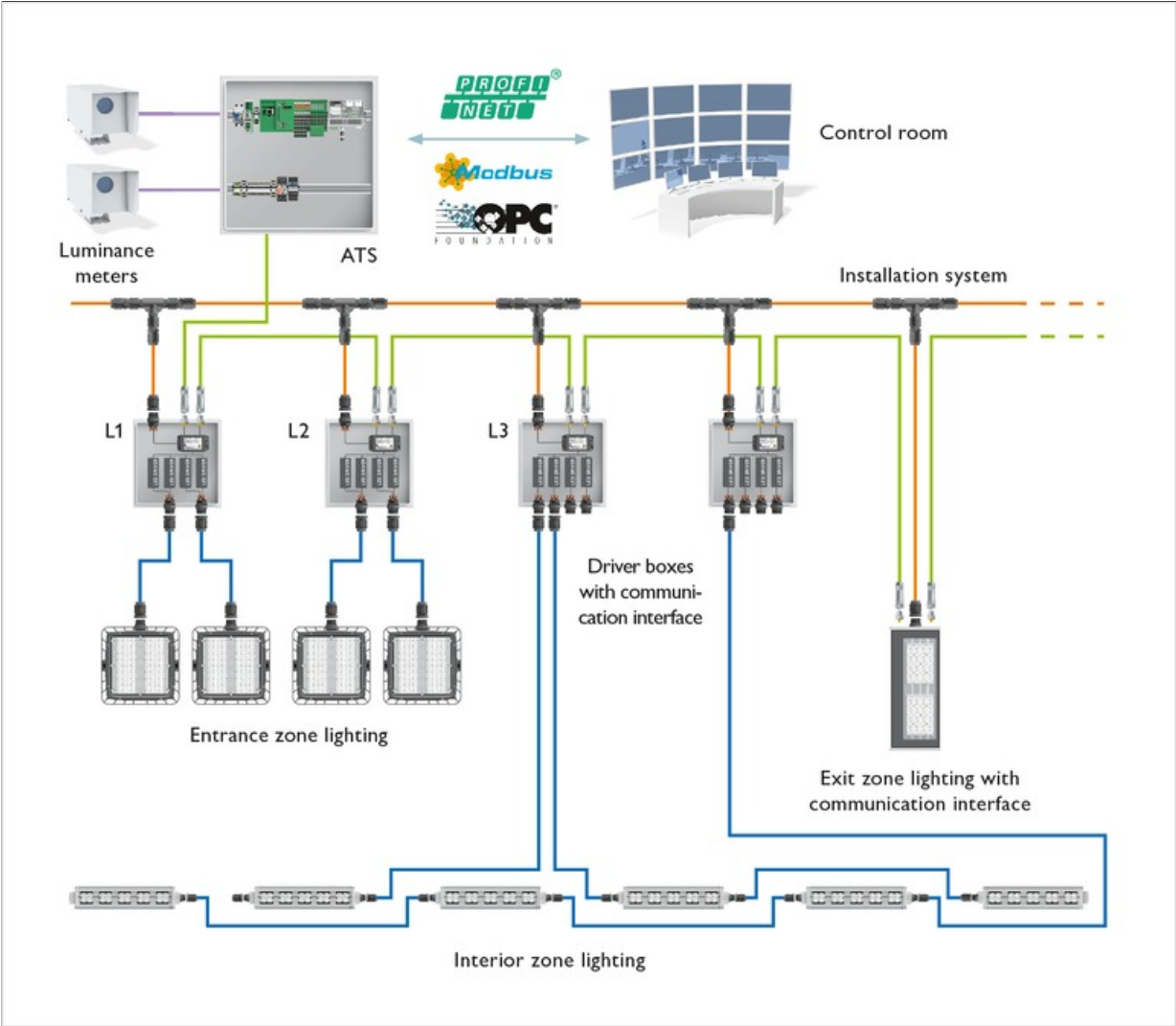
Easy installation of the solution, thanks to QPD

## Solution

Phoenix Contact has developed lighting solutions for tunnels with state-of-the-art LED technology. The LED lights can be controlled either directly or via so-called driver boxes. The boxes contain the LED drivers for controlling the lights. The exact position of the lights and the driver boxes has been defined

by Schröder specialists based on a photometric analysis of subsequent tunnel lighting. In parallel with preparatory work, the power and bus cables are delivered pre-assembled to the construction site. This resolves a problem typically encountered by the installation company before the cables are manufactured. Since all cables are equipped with an automatic phase rotation, the three phases of the power connection are loaded evenly. The time-consuming continuity test of the cables and the subsequent rewiring are therefore a thing of the past.

The actual control of the lumgate activation electronics and LED drivers is predefined in the form of 50 different scenarios. There are also 15 special scenarios that can be prioritized in special situations, for example in the event of an emergency or a dangerous event. The maximum permissible speed inside the tunnel also influences the required light intensity and is therefore also taken into account in the controller. In addition to the application program, the specifications from the photometric analysis also go into the ATS. Together with the other general parameters, the configuration file that the controller reads in automatically forms the basis for lighting control. This ensures that both the specifications of the tunnel operator and the applicable legal requirements are accurately fulfilled. What's more, only as much light is generated as is required at any particular time, which can help to reduce energy costs.



Structure and elements of the lighting solution

The system keeps installation times to a minimum, with predefined control cabinet solutions as well as the QPD installation system in the field and in the lamp. Further advantages of the tunnel lighting solution become apparent when the life cycle of the system is calculated.

## Your advantages

- ✔ Plug and Play, thanks to predefined parameters and automatic addressing
- ✔ Versatile solutions, thanks to the ability to dim 240 different light fixtures, across distances of up to 96 km, plus 1920 LED drivers with just one controller
- ✔ Enhanced diagnostic status through monitoring of the operating time and current consumption
- ✔ Constant Light Output with actual operating hours and maintenance factors

## Products

Description	Type	Order No.
Advanced Tunnel System (ATS) – pre-assembled control cabinet including application software for infinite dimming of tunnel lights	e.g., TSL-SC-RTL-ATS/D0S12	2403506
Basic Tunnel System (BTS) – ready-to-install control cabinet for switching lights	e.g., TSL-SC-RTL-BTS	2402652
Tunnel Control System (TCS) – control cabinet solution for networking several ATS and for connection to a tunnel control center with defined communication protocols	e.g., TSL-SC-RTL-TCS/D0S22	2403515