Making your installations safer

Solutions for road tunnels
Your challenges

- Maintaining optimal security in harsh conditions with low cost
- Guaranteeing all functionalities in all conditions
- Protecting, informing and guiding users
Your needs, our experience: an intimate link

Controlling, managing and maintaining the reliability of the tunnel. For the safety of the users, you must choose safe and long-lasting solutions both in automation and in electrical distribution.

To answer your challenges, you need:

> Uninterrupted lighting
> Stable air quality
> Smooth traffic
> Uninterrupted electricity supply
> Permanent monitoring of all tunnel functions
> Automatic detection of incidents
> Information and protection of users
> Effective smoke clearance
> Dependability of automated operations
> Safety of user shelters.

Our solutions

> More flexibility to modify and expand your installation at any time, without affecting the operation
> More reliable information on the state of the tunnel
> A more effective control of the tunnel thanks to a user-friendly visualization and navigation
> A better ability to react thanks to stabilized real-time information
> Better operational decisions thanks to real-time recommendations generated by the system
> Maintainability of the tunnel functions anytime without degradation of services.

30 years of experience in tunnels. A worldwide reputation with selected specialized partners.
We are committed to promoting dialog at a very early stage in your road tunnel project. Our in-depth knowledge about every aspect of your business means we can identify the best electrical distribution and control system architectures to match your requirements.

“Power & Control” solutions

Your challenges

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Traffic control
- Counting
- Classification
- Event detection of vehicles

Signalling and traffic lights
- Traffic management
  With variable displays
- User information
  With message displays

Fire protection
- Fire detection
- Alert creation
  With extinguishers, naspos, sprinklers, thermal sensors

Emergency call
- User care
- Alert creation
  With intercom

Acoustic signals
- Functional coordination
- User information
  With loud speakers, speaker network

Ventilation
- Management
- Loop control
- Dependability
- Zero point management
- Energy efficiency
  Of longitudinal ventilation, transversal and mixed
Your safety in tunnels

Securing a tunnel: 4 fundamental pillars.

> **A suitable solution**

There is no single generic solution for all tunnels. Each tunnel has its own solution. A tunnel is an autonomous system comprising essential functions such as ventilation, signalling, fire detection, smoke abatement, etc. User safety and protection of the infrastructure can only be guaranteed by the availability of these functions and by the high degree of integration between them. However, the availability of these functions may be significantly reduced by a selection of technological equipments that are too complex to implement.

> **Integrated design**

Securing a tunnel means mastering all the equipment located inside it. But above all it means ensuring tunnel functions are maintained to their maximum capacity at all times. This requires that considerable interdependence be designed between them. The initial investment may be higher but profitability will increase over the years, as it is maintenance that will cost the most. This is even truer if the tunnel is far from residential areas.

> **Energy efficiency**

Energy continuity is essential to ensure the safety of the tunnel. And permanent availability in all conditions of all tunnel functions must be absolute.

Each tunnel requires a special and suitable solution that needs a huge quantity of resources: execution costs, construction time, electricity, operation capacity. Our solutions rationalize these resources for maximum efficiency during the construction phase and then during operation.

> **Efficient air management**

User safety and protection of the tunnel infrastructure require that the air is suitably renewed in all situations. Necessary air management is linked to the ergonomics of the location and follows the laws of physics. This is a very special job. All possible incidents must have been foreseen. And for each event, a specific smoke abatement and possible evacuation scenario must be planned. This requires an intelligent system to detect, filter and stabilize tunnel status data.
Electrical distribution
Secure, redundant electrical supply system
Advice on architectures to provide the highly available solutions required by any modern tunnel design.

Offer
> Medium voltage switchgear
> Dry type transformers (star delta, zig-zag, double secondary)
> Low voltage equipment
> Static backup supply (UPS)
> Harmonics filtering and power factor correction.

Centralized Technical Management
Simple, scalable architectures, adapted to meet the required availability criteria
Reliable data communication
> Just enough data exchanges
> For permanent high availability of network bandwidth

Coherence of application data
> Intelligent input filtering
> Stabilization of inputs
> Intelligent data comparison for high data coherence

Reliable automated decisions
> Management of sequence of events
> Automatic generation of problem-solving strategies

Dependability of tunnel functions
> Redundance of functionnalities.

A team of dependability experts
Our expertise at your service
> Specific studies
> Coordination of dependability projects
> Dependability assessment
> Optimisation of logistics
> Validation of critical software applications
> Revamping while in operation
> Turn-key solutions
> Energy efficiency.

A worldwide foundation with local partners
Our sales network, in close collaboration with our local partners (engineering and consulting offices, system integrators and panel builders), has the capability to perfectly meet your needs in all the key areas of a tunnel:
> ventilation
> electrical distribution
> centralized technical management.
All across the world, you benefit from the same high-level know-how. Our local partners, trained by Schneider Electric, know how to get the most out of our products, architectures, software and services.

Ensuring drivers and users safety while crossing a tunnel is of utmost importance especially for the Road and Tunnels public authority. This leads to select highly experienced partners and vendors able to drive careful risk analysis. They equip operating structures with safe installations and equipments which are specifically designed to minimize the risk of accidents and to deal effectively with emergency situations.

In this realization, Schneider Electric has been working in close partnership with us and our partners, providing their know-how and skills to identify and implement the right solution.”

SITAF, TECNOSITAF - Italy
Main worldwide references

Australia
> Melbourne City Link
> Victoria CityLink

Austria
> Semmering Tunnel

Belgium
> Covered trench in Cointe

China
> JingZhu Highway tunnels (Guangdong province)
> Outer Ring Road (Shangai)
> Xuanwu Lake tunnel (Nanjing)
> GuangYu Highway Huayin (Sichuan province)
> Ningbo Yong River Changhong (Zhejiang province)
> Shannai Highway Lianhuan (Guangdong province)
> Xihu Lake tunnel (Zhejiang province)
> HongKong Road Underpass

Denmark
> Funen/Jutland: bridge-tunnel
> Store-baelt

Denmark-Sweden
> Oresund

France
> l’Epine (Chambéry)
> Dullin (A43)
> Sainte Marie aux Mines
> Des Monts (Chambéry)
> Vuache
> Bastia
> Lioran
> Autoroute A8
> Antony
> Rond Point
> Paillon (Nice)
> Orelle
> Monaco
> Les Grands Goulets
> Canal de Bourgogne
> Porte des Lilas
> Le Sinard
> La Major (Marseille)
> Eurotunnel (Dunkerque)

France-Italy
> Fréjus,
> Mont Blanc

France-Spain
> Somport

Italy
> Autostrada
> Catania-Siracusa
> Autostrada dei Fiori
> Autostrada del Brennero
> Autostrada Messina-Palermo
> Autostrada Torino-Savona
> Autostrada Torino-Bardonecchia
> Galleria del Drino
> Galleria di Narno
> Galleria della Fricca
> Galleria Leone
> Galleria d’Ambrosio
> Galleria Montecrevola
> Galleria Montezemolo
> Galleria Marinoso
> Galleria Martignano
> Galleria della Valsassina

Switzerland
> Geneva Canton motorway-road
> Sauges and Gorgier

United Kingdom
> Dartfor

USA
> Boston’s Big Dig

Russia
> Gagarinsky
> Kutuzovsky
> Lefortovsky

Spain
> Viella
> Cerdera
> B20
> Bracons
> M111
> Rovira
> M30

Make the most of your energy