SAFETY IN TUNNELS

Tunnels are a great invention for transportation. Mountain or waterway crossings that would have previously taken hours or days now take only minutes. From a safety aspect, tunnels offer protection from the natural elements and consistent temperatures. In emergency situations, however, tunnels offer some unique communication and safety challenges that are not commonly found elsewhere.

Zenitel offers intelligent communication solutions for tunnels, integrating Voice Alarm, emergency telephones, critical communication over TETRA or LTE and more, enabling control-room operators to handle any situation quickly and efficiently and to hear, be heard and understood, every time. The integration of multiple audio services enables a seamless merger of traffic control, emergency services and the public, getting the right message out at the right time, saving time, lives and property.
INTEGRATED AUDIO COMMUNICATION SOLUTIONS FOR TUNNELS

Our offerings for Critical Communication Solutions in and around tunnels.

CONTROL ROOM SOLUTIONS

For the control room operator, it is essential that the communication solution can integrate to other systems such as CCTV, early-warning systems, emergency communication, telephony systems. Integration and conferencing also enable recording of conversations over several different systems, as required for incident investigations.

Remote monitoring of systems in the tunnels ensures availability of the system and helps detect failing- or faulty devices, cabling faults or even sabotage.

Key products for a control room solution:

AlphaView is primarily intended for use in a control room environment. It provides a clear overview for operators, with multiple layout possibilities according to the operator’s preference.

Vingtor-Stentofon Recording is a cost-efficient, fully-featured IP-based audio recorder with additional support for video recording and audio analytics.

IP Control Room Master Station has an extensive display and up to 100 Direct Access Keys, which can have any function you like – for example, they can serve as indicators for each IP station (Status OK, Fault, Call, etc.).

IP Exigo Call Panel features up to 35 Direct Access Keys.

IP or Conventional Desktop Station features 14 Direct Access Keys and display.

TECHNICAL ROOM

Technical rooms are located throughout the tunnel and are connected via an IP network. With the EXIGO PA system, we can put our amplifiers in these rooms, creating a decentralized PA System. The Emergency Telephones / Help Points are connected to the IP network available in the tunnel and in the Help Point cabinets.

The XE1 or ESC1 are placed somewhere in the network, for example, in one of these technical rooms or in the Tunnel Control Center. There’s often a local traffic control center and a remote control center where several tunnels are controlled.

Public Address Systems

In evacuation situations, such as a fire, it can be infeasible or even impossible to wait for help from emergency services to arrive. The principle of self-rescue is usually the most efficient to save lives and property in these situations. Automatic traffic management systems can limit the scope of the incident by stopping cars from entering the tunnel. A voice alarm system can guide the public to the quickest route to safety, instruct them when to leave or stay in their vehicles and advise on how to guard against hazards. Via fireman’s panels at the tunnel entrance, or through radio/telephone integration, the emergency personnel can further direct the public and the rescue effort over the PA system.

We can offer three options as a system setup:

Centralized: Amplifiers are in one or two technical rooms and cabling is all the way to the loudspeakers.

Decentralized: Amplifiers are in the technical rooms throughout the tunnel to save on loudspeaker cabling.

Distributed: This involves placing the amplifiers close to the loudspeakers, for example, behind the emergency telephones in the help points or in a technical corridor next to the road tunnel. This is the cost-efficient solution, allowing you to save on loudspeaker cable.

Key products for a PA solution:

Network Amplifier
The ENA2100 offers 2 x 100W in the 19" half-rack size. It is suitable for mounting in 19" racks, as well as on-wall or in cabinets. Dual Ethernet connections and loudspeaker line-monitoring are standard.

System Controller
ESC1 is an IP-based and networkable PA controller. ESC1 supports full A+B redundancy. ESC integrates PA/VA and radio or telephony via SIP, AlphaCom or analog integration.

Intelligent Noise Sensor
The EINS1 Noise Sensor enables intelligent measurement of background noise for AVC applications. IP-based, it offers flexibility in placement and ease of installation.

VoIP Integration Module
This VoIP Integration Module offers great flexibility, with Audio in/out, 6 digital I/O & dual network connections. Use the TKIE-2 to integrate legacy PA systems, fireman’s panels, radio, etc.

Public Address Systems

IP loudspeakers can be placed wherever you need one – escape corridors, technical rooms, etc.

Every loudspeaker is powered via PoE, which allows for flexible placement and installation. Output is synchronized and equalized to optimize intelligibility. Be heard and understood - every time.

TT1020 tunnel loudspeaker.
This high-directionality loudspeaker beats the acoustical environment in tunnels. With acoustic simulations, we can determine the most efficient loudspeaker design to meet intelligibility requirements. This guarantees audio quality before installation.

Contact us today for more information: www.zenitel.com.
WHY VINGTOR-STENTOFON?

The Vingtor-Stentofon critical communication portfolio offers state-of-the-art quality audio software and hardware. Just press a button, and you can call for immediate assistance, help and support. The voice on the end can be heard loud and clear, thus eliminating misunderstandings or misinterpretations. Even in very noisy environments, we offer crystal-clear audio – driven by our Turbine stations with 10-Watt amplifiers and active noise cancellation software included. Our quality products are built to last, with backwards compatibility, reducing the cost of ownership.

HELP POINTS/EMERGENCY BYPASS

Roadside problems like a flat tire or an empty gas tank can quickly become dangerous situations in tunnels. Lay-bys where cars can park with emergency call points are therefore a requirement for safe tunnel operation. A tunnel’s enclosed space carries sound well, and road noise is amplified inside the tunnel, making it very hard to be understood. Thus, a communication solution suitable for tunnels must offer high-quality audio and powerful noise reduction to maximize intelligibility. The devices themselves must be rugged enough to withstand the constant pollution, dust and water, as tunnels are power-washed regularly with high-pressure water.

We offer IP and Conventional hotline stations in several models – a fit for all requirements and conditions.

**IP Hotline**
Features Turbine intelligence and quality. For situations where limited space is available, but high-quality communication is required.

**Industrial Intercom**
Robust stainless steel intercom with IK10 and up to 105dB output.
You’ll be surprised by the audio quality, even in challenging tunnel environments.

**IP Heavy Duty Telephone**
Extremely robust station in several designs: with or without a door, with or without a full keypad. Equipped with Audio Path Surveillance for optimal reliability.

**FIREMAN’S PANEL**
In case of an emergency, response teams like firefighters are entering the tunnel. Via this panel, they can communicate directly with the operator, make an announcement in the tunnel, etc. Communication is especially critical in these situations, and the Vingtor-Stentofon solution makes sure you’re always heard and understood.

Roadside problems like a flat tire or an empty gas tank can quickly become dangerous situations in tunnels. Lay-bys where cars can park with emergency call points are therefore a requirement for safe tunnel operation. A tunnel’s enclosed space carries sound well, and road noise is amplified inside the tunnel, making it very hard to be understood. Thus, a communication solution suitable for tunnels must offer high-quality audio and powerful noise reduction to maximize intelligibility. The devices themselves must be rugged enough to withstand the constant pollution, dust and water, as tunnels are power-washed regularly with high-pressure water.

We offer IP and Conventional hotline stations in several models – a fit for all requirements and conditions.

**IP Hotline**
Features Turbine intelligence and quality. For situations where limited space is available, but high-quality communication is required.

**Industrial Intercom**
Robust stainless steel intercom with IK10 and up to 105dB output.
You’ll be surprised by the audio quality, even in challenging tunnel environments.

**IP Heavy Duty Telephone**
Extremely robust station in several designs: with or without a door, with or without a full keypad. Equipped with Audio Path Surveillance for optimal reliability.

**FIREMAN’S PANEL**
In case of an emergency, response teams like firefighters are entering the tunnel. Via this panel, they can communicate directly with the operator, make an announcement in the tunnel, etc. Communication is especially critical in these situations, and the Vingtor-Stentofon solution makes sure you’re always heard and understood.