

## Overall solutions for radio systems

Comlab is your ideal partner for professional solutions in the RF sector. Our core business includes broadcasting, PMR and communication systems for railway and road tunnels, as well as building lighting, extensive outdoor radio coverage and specialised solutions.





*Overall reliability is of particular importance in the case of radio systems for the emergency services. This is just one of the strengths that have led to Comlab becoming the market leader in Switzerland for tunnel radio systems and establishing itself worldwide as a provider of RF systems.*

## Solutions that deliver full coverage

For over thirty years, we at Comlab have focused on radio frequency (RF) technology. Our involvement includes design, development, production and installation of turnkey high-frequency radio systems. Our considerable expertise and many years of experience mean that we are able to competently support our customers in discovering solutions for all of their problems.

Comlab is a Swiss supplier of a comprehensive range of radio frequency technology and we form part of the Haag-Streit Group. We at Comlab have acquired considerable expertise over a long period of time, and this enables us to respond flexibly to the needs of our customers with

regard to current developments. In turn it will empower us to continue to deliver innovative system topologies for a broad range of high-frequency radio services in the future. Our specialists not only speak the same language as our customers, but they also understand their concerns. This means that they can provide comprehensive, tailor-made solutions. And our commitment to being the market leader results in our delivering nothing less than the very best. Our systems are of the highest Swiss quality – they are innovative, reliable and durable, thus representing an extremely sound longterm investment for our customers.





**Left:** GSM-R network for Beijing and Tianjin railway stations, which serves the fastest stretch of rail (speeds of up to 350 km/h) used by scheduled trains in the world. **Right:** Analog and digital radio for the emergency services as well as broadcasting and telepage services for all of the tunnels of the A1 and the A5, and almost blanket coverage of all of the motorway tunnels in Switzerland.

## Wavelengths ahead in terms of expertise

Comlab is in a position to handle in house the entire process (engineering and product development through component production to installation, support and maintenance) involved in manufacturing and deploying high-quality RF systems. Our extensive know-how always keeps us one step ahead of the competition.

### COMLAB AG

Engineering

Product development

Component production

Products

Systems

Assembly & commissioning

Support

Maintenance

Comlab specialises in radio frequency technology. We are in a position to handle every aspect of the development, production and implementation of professional radio systems all over the world. Highly-qualified and experienced graduate engineers advise our clients,

design the systems, develop new components as necessary and guarantee innovative engineering. Our products are manufactured in state-of-the-art Comlab facilities at various locations in compliance with stringent quality standards. Qualified RF engineers assemble and install the systems on site and ensure long-term support and maintenance. Whatever the challenge, we find the best overall solution and provide reliable, long-term cover for the entire system life cycle from a single source. Countless testimonials from well-known customers underscore our position as global market leaders in our field.





*Left: Extensive analog emergency services radio system for the AFG Arena and Shopping Centre in St. Gallen. Right: Digital trunked radio network for the emergency services in the tower of the Basel Trade Fair Centre (Messeeturm Basel).*

## Experience the full spectrum

As a supplier of comprehensive RF solutions, we are our customers' single point of contact for fully customised tunnel, indoor, outdoor and special applications.

Comlab's systems consist of modular components that can be easily integrated into the overall system and perfectly adapted to our customers' requirements. This modularity also facilitates subsequent expansion and retrofitting. Comlab's systems encompass the following technologies: GSM-R, TETRA, TETRAPOL, UHF, VHF, FM, FM Info, AM, T-DAB, T-DVB, ISDB-T, GSM P900, DCS, UMTS, etc.

### Road and railway tunnels

We are able to supply mobile radio services, digital audio broadcasting (DAB),

VHF channels, GSM-Railway, intercom facilities for the police, analog and digital radio for the emergency services as well as GSM services for passenger mobile communications in road and rail tunnels. Various technologies can be combined in a single system.

### Indoor

Comlab solutions comprise the provision of radio and broadcasting services for large building complexes for customer information and the emergency services. There is also the possibility of combining

different technologies in a single indoor system.

### Outdoor

Reliable, high-quality radio and customer information systems for outdoor applications.

### Specialised solutions

Comlab offers solutions for a wide variety of other specialised fields, for example military applications, identification and positioning systems, microwave radio links and broadband transmission.

Radio frequency systems	Products	Services
Tunnels	Channel and band-selective repeaters	Project engineering
Indoor	Fibre optic converters	Products
Outdoor	Radio cables and antennas	System management
Specialised solutions	Base stations and terminals	Hardware and software development
	Monitoring/configuration software	Component production
		Assembly and commissioning
		1st/2nd level support and training
		Maintenance

Services, products and systems are also offered individually

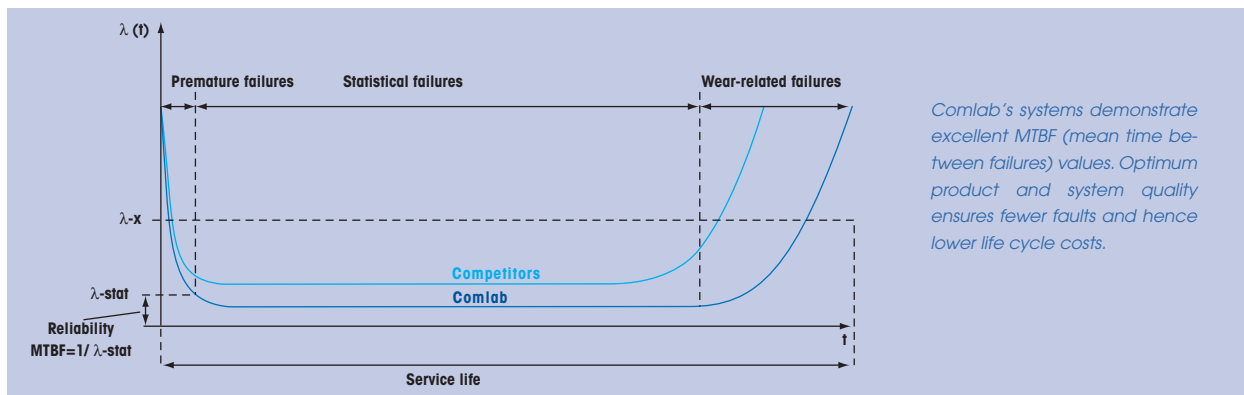




*Left: The planning and execution of the entire mobile communications systems in the 34.6 km long Lötschberg base tunnel as a GSM-R network, analog and digital emergency services radio as well as GSM Public900 for passengers' mobile communications. Right: System engineering and repeaters for the customer information system and the emergency services radio network of the M2 Metro, Lausanne, the smallest automated underground railway system in the world.*

## Quality guaranteed and no radio silence

Comlab systems are renowned for their long service lives and their robustness in tough, professional applications. The hardware and the software are ISO-certified and meet the most stringent reliability and failsafe requirements. Superlative testimonials, over 500 km of railway and road tunnels supplied with our systems, and countless indoor and outdoor applications produced by Comlab are an impressive demonstration of the standard achieved.



At Comlab, our RF systems and products provide superior quality and good value for money. The analyses and methods of calculating the reliability of the components are based on a holistic approach. We analyse the entire product chain with a fault tree analysis (FTA) to enable specification of the MTBF of the signal

transmission. The MTBF as determined by Comlab therefore covers the reliability, availability and maintainability of the entire system (RAM) and is much wider in scope than the conventional MTBF figures for each product. The MTBFs of our systems are also based on the evaluation of actual projects rather than the usual

vague estimates that tend to apply. Consequently, our customers receive realistic data as evidence of the quality and failsafe characteristics of Comlab's systems. Furthermore, a 10-year supply guarantee and warranty mean that our systems represent a secure long-term investment.





*Left: High-quality components form the backbone of our systems. Right: State-of-the-art production lines guarantee efficient, cost-effective production of Comlab products.*

## Achieving flexibility worldwide

Ideal corporate scale and extensive process know-how enable us to offer customers unsurpassed flexibility.

Comlab's high degree of vertical integration and extensive range of products and services under one roof make the company more versatile than the competition. Consequently even built-to-order and customised components and systems

are not a problem. A clear, flat corporate structure, short communication and decision-making channels and dedicated contacts develop a personal rapport with the customer. Highly-qualified specialists with a wealth of practical experience deal with our customers' concerns in person and are aware of their individual needs and local circumstances. Reliable partners trained by us are on hand all over the world to provide service, support and training as well as rapid assistance in the event of any problems.

**Key advantages at a glance**

- High degree of technical expertise throughout the entire process
- Comprehensive, complete solutions from a single source
- Reliable systems and components with practical demonstration of MTBF values
- Systems of renowned Swiss quality at attractive prices
- Individual solutions tailored to meet your needs
- Experienced graduate engineers providing personal attention

wavelengths ahead.

**COMLAB AG** | Ey 13 | CH-3063 Ittigen | Switzerland | Phone +41 31 924 24 24 | Fax +41 31 924 24 20 | [www.comlab.ch](http://www.comlab.ch) | [info@comlab.ch](mailto:info@comlab.ch)