funkwerk TSS
TETRA SECURY SYSTEM

funkwerk)))
security communications

Maximum security, even underground: funkwerk TETRA FT4 S Ex

TETRA

The certified TETRA radio for personal security, communication and precise localisation: for hazardous tunnelling and mining environments.

Certified for hazardous mining
I M2 Ex ib I Mb

Safety. Everywhere.

In order to satisfy increasing demands for safety and efficiency in tunnelling and mining operations, radio communication has taken a key position. A reliable and cost-effective communication solution is now available in the form of the TETRA-based funkwerk TSS Security-System, which satisfies all the special requirements in tunnelling and mining operations. Its flexibility of configuration accommodates the concrete realities of work underground, while also offering voice and data transmission in parallel operation.

With this system, funkwerk TSS offers a significant improvement in communication, safety and reliability as well as optimal monitoring and management of personnel underground. The flexible adaptation and optimisation of the system fulfill the most up-to-date safety requirements and concepts in tunnelling and mining, thus increasing productivity.

Thanks to the IECEx and ATEX certification of our TETRA systems, which even conform to the Mining M2 category, the funkwerk TSS system is now also suitable for use in tunnelling and mining applications where the most stringent safety requirements apply.

World-wide implementation of our systems is guaranteed by corresponding supplementary type approvals: ATEX for Europe, IECEx for international use, FM* and IC* for the U.S. and Canada, GOST in Russia as well as ANZ* for Australia.

With the implementation of the funkwerk TSS system in tunnelling and mining applications, the most stringent safety requirements and challenging scenarios can now be fulfilled. Voice communication, alarm functions and precise localisation enable a permanent overview of the entire situation underground, assuring efficient coordination for the fastest possible response in an emergency.

*) in preparation

IEC **IECEx** **Ex**

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People are involved.

TETRA – digital trunking radio for tunnelling and mining applications

If the device is logged-on to the system, a cyclic function and status test is performed automatically, to identify hidden malfunctions. When an alarm is detected, help is summoned automatically and immediately. Precise localisation via inductive radio beacons facilitates the process of determining the optimum response strategy, thus ensuring the most rapid and targeted assistance possible.
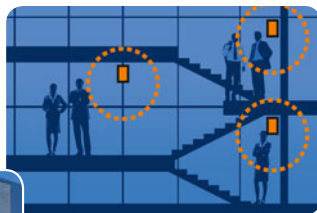
Core functions of the funkwerk TSS Secury System:

▶ Capture of all persons in a danger zone

▶ Personal security with position display on site plan

▶ Alarm transmission and request for assistance in real time

▶ Transfer of position data of those requiring and rendering assistance

▶ Directing of response personnel—with direction and distance information

▶ Duplex voice communication with trapped miners

▶ Escalation scenarios

▶ Detailed noting and logging of all information in the event of an alarm
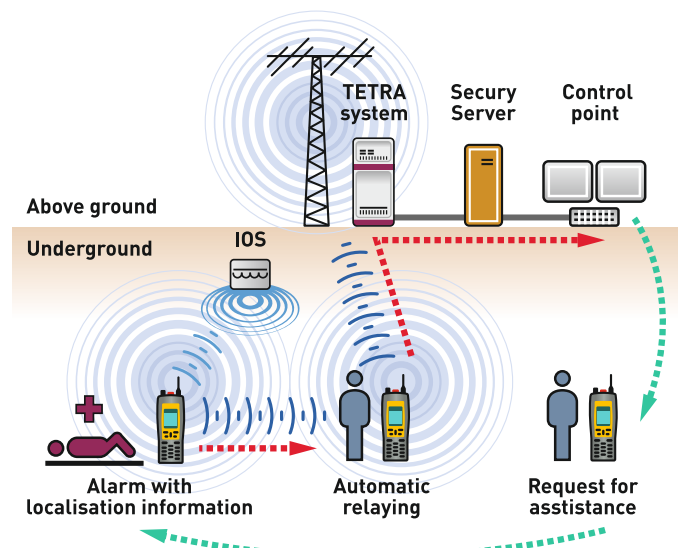
Exact localisation with funkwerk IOS

High precision
Exact, failure-free positioning, room and floor-specific

Flexible use
Expandable range with underfloor loops and external antennas

Above ground

Underground

IOS

TETRA system

Secury Server

Control point

Alarm with localisation information

Automatic relaying

Request for asstistance

Integration in existing installations

Tagging & Tracking

The radio beacons and gateways of the TETRA Secury System (funkwerk TSS) allow precise localisation persons and machines, accurate logging of all events and integration in SCADA systems.
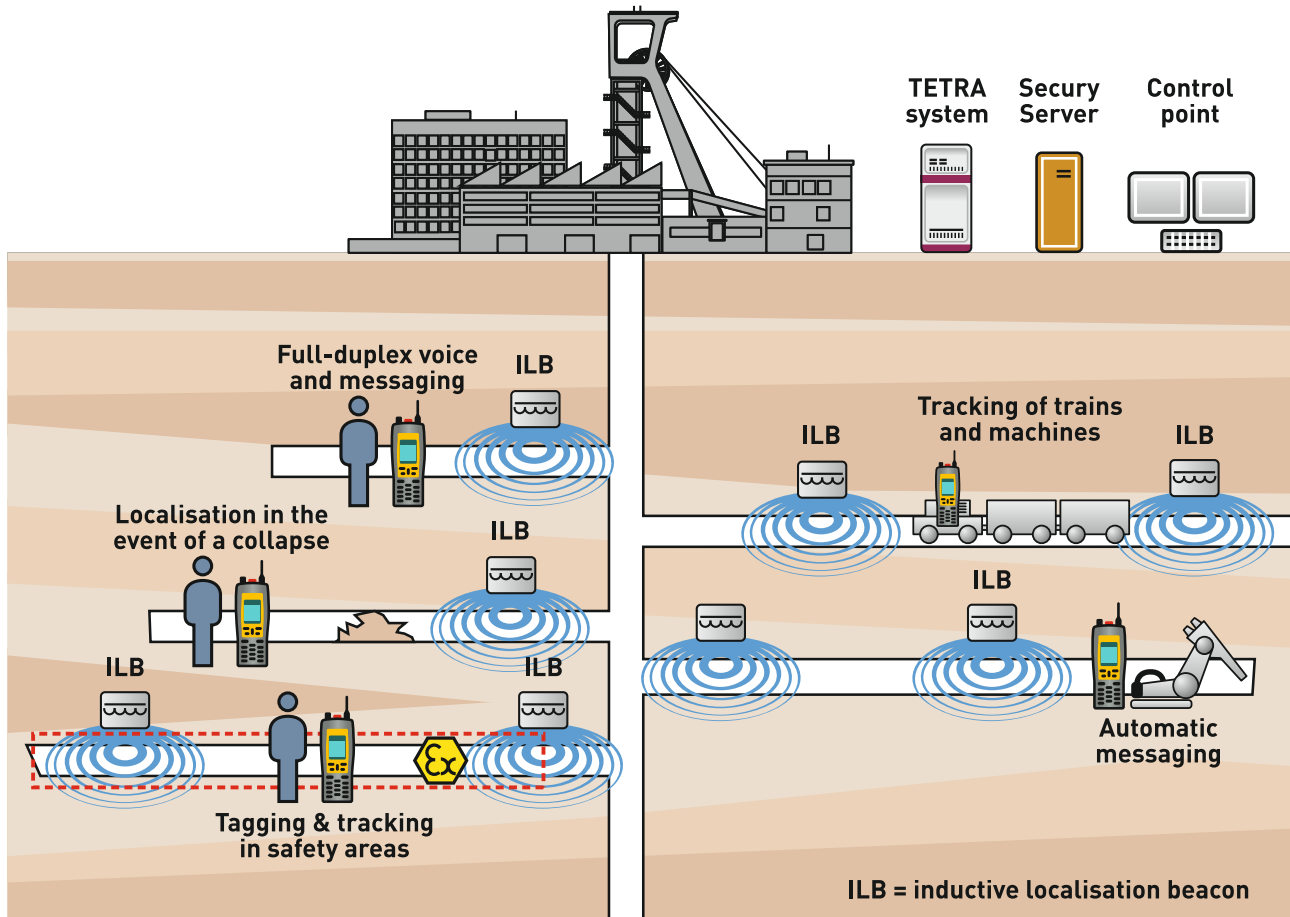
The funkwerk ILB series of radio beacons enable precise, unproblematic localisation while also offering flexible configurability and expandability thanks to external antennas and surface loops.

By connecting existing leaky-feeder systems, reliable radio coverage of a mine in its entirety becomes possible, even in areas with a firedamp hazard. Existing systems are thus enhanced with professional, reliable voice and data communication as well as localisation and tracking.

The "Tagging & Tracking" functionality allows precise and automatic capturing of all persons - and also machines - in defined hazardous zones. When entering a hazardous zone by passing a beacon, the subscriber is identified accordingly by the system. Depending on the requirements, miners, machines, trains or other moving objects can be captured. All actions and positions are logged. The control point is thus kept informed at all times regarding the complete current situation.

As a TETRA application, Tagging and Tracking is extremely useful in practice. In addition to improvements in transparency and safety, sources of danger can thus be detected, emergencies and accidents optimally dealt with and the overall productivity of the undertaking can be increased.

TETRA system

Secury Server

Control point

Full-duplex voice and messaging

ILB

Localisation in the event of a collapse

ILB

ILB

ILB

Tagging & tracking in safety areas

Tracking of trains and machines

ILB

ILB

ILB

Automatic messaging

ILB = inductive localisation beacon

The funkwerk FT4 TETRA radio handsets:
high performance components for flexible security systems.

The world's first TETRA handset to be certified for the M2 mining protection class is now available as the funkwerk FT4 S Ex.

Developed for harsh industrial environments, the funkwerk FT4 series of TETRA handsets can also withstand extreme temperatures, moisture and heat as well as mechanical loads such as being dropped or struck. The colour graphic display and the illuminated keyboard enable optimum orientation and intuitive operation under all conditions; the audio system is suited to noisy environments and can be enhanced with external accessories. A high-performance battery takes care of long stand-by and talk-times and can be recharged rapidly when required.

A separate alarm button, which can easily be identified by touch at any time, enables fast, unambiguous alarm triggering. State of the art sensors built into in the device allow automatic movement alarms, time-out alarms, position alarms and loss alarms (by means of a tear-away tag) to be activated.

This allows emergency situations to be identified quickly and together with the current position, be transferred to the system.

Highlights of the funkwerk FT4 S (Ex) radio handsets:

▶ Digital voice communication with Push-To-Talk, even in groups

▶ Rapid call set-up

▶ All-call

▶ Full-duplex telephony with private function

▶ Real-time data communication

▶ Professional messaging to subscribers and groups, with acknowledgement function

▶ System-wide announcements for evacuation scenarios

▶ Mature alarm functions for manual and automatic alarms

▶ Precise localisation with display on site plans

▶ Automatic capture when entering danger zones

▶ Assistance with locating trapped miners by means of a remote-controlled audio alarm

▶ Possible to implement localisation of machines and trains

▶ Radio data capture for telemetry and SCADA

▶ Monitoring of environmental conditions below ground

▶ Certified to the highest ATEX and IECEx directives as well as Mining Category M2

Push alarm 1 (Emergency)
Position alarm
No-motion alarm

Push alarm 2 (Warning)
Loss alarm
Time alarm

Quality made in Germany

Certified for hazardous mining
I M2 Ex ib I Mb

Be safe—anywhere, anytime!
Specialised Solutions

- **Personal Security**
- **Explosion Protection**
- **Messaging**

- **Localisation**
- **People Tracking**
- **Guard Round Control**

With many years of experience in professional security systems, Funkwerk Security Communications offers BGR-certified* radio systems for energy utilities, the petrochemical industry as well as prisons and healthcare/nursing institutions in which the greatest possible security and permanent control are indispensable.

Security systems by Funkwerk Security Communications have for the past 50 years ensuring optimum safety in industry and energy utilities, law enforcement and security authorities, as well as clinics and healthcare institutions—and continue to do so.

As a leading manufacturer, our systems offer not only high levels of reliability and functions aimed at ease of use but also an ability to adapt optimally to your specific requirements.

We develop and design for real world conditions and are ready to support our clients throughout the life cycle of the system.

Our systems are optimised for reliable, long-term application in typical conditions that actually occur—backed up by competent and flexible partners to offer assistance on site.

*) BGR: Berufsgenossenschaftliche Regel = German Employer's Liability Insurance Association Rule

Should you require further information, we are happy to oblige!

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