



Underground Communications Solutions



ABOUT US

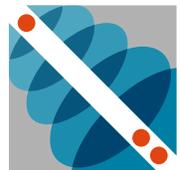
www.sigma-telecom.com

SIGMA – UNDERGROUND COMMUNICATIONS SOLUTIONS

SIGMA has provided communication solutions to more than 1000 underground mines and tunnels in the 5 continents. We contribute with innovation to the mining industry, backed for many years of experience installing communication systems, at a low cost and a high performance. Furthermore, we provide added value by integrating solutions concerning security and productivity on state-of-the-art communication platforms that grant your Company with a clear competitive advantage.

From the begging SIGMA has developed permanent innovations to its underground communication systems, to provide the mining industry and confined spaces with the most advanced technology, from the continuous re-design of its Leaky Feeder networks, to the design of DRS networks, that allow multiple wireless signals to be sent underground.

SIGMA started on 2010, based in Concon city, central cost of Chile.



Underground communications

SIGMA PRODUCE UNDERGROUND COMMUNICATIONS FOR :

- ✓ Underground mining
- ✓ Vehicular tunnels
- ✓ Confined environments

UNDERGROUND MINING

Underground mining requires coordinating tasks in each work shift, in the same way open pit mining does with radio systems. For that purpose we have designed a fully reliable communication network, easy to install, easy to manage and modify. On the other hand, it is a system especially robust for harsh mining environments.

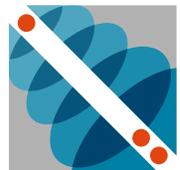
VEHICULAR TUNNELS

The new vehicular tunnels include advanced safety systems. For that reason we have designed a communications systems that allows various signals to be entered and broadcast wirelessly within the tunnels (FM music, BREAK IN, VHF, UHF, TETRA, P25, Cellular, etc.)

CONFINED ENVIRONMENTS

Other practical purposes for our communication networks are:

- ✓ Water tunnels, for its construction coordination
- ✓ Service tunnels. There are several underground services below cities, such as mains network, underground railway, etc.
- ✓ Big ships.
- ✓ Wide underground levels, underground parking, and every closed space without any surface connection.



Leaky Feeder System (LFS)



The signals that allow wireless radio communication are widespread with no problem in open areas, nevertheless, the situation is thoroughly different in tunnels and confined spaces.

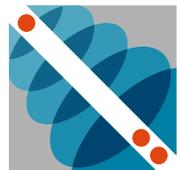
Communication becomes extremely difficult due to multiple reflections and according to the size of the tunnel. As a result, communication is reached at significantly shorter distances.

To solve this difficulty, the Leaky Feeder systems have been used in the last 50 years. They allow high quality communication in every tunnel, no matter its extension. The Leaky Feeder range is the most simple, reliable and widely proved system to establish wireless connections in tunnels.

With that purpose, a low cost radiant cable (Leaky Feeder cable) is used; it runs along the tunnels acting as a continuous antenna, allowing wireless communication. To keep a high signal level, amplifiers are also installed at regular distances, ensuring the best communication quality.

SIGMA is a pioneer in the communication industry, both because of the great number of tunnels that rely on our systems, as well as our innovate processes in the area.

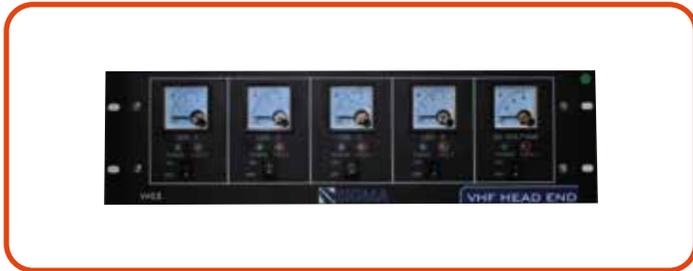
The 16th version was launched at the beginning of 2020 and we are already working on the next one. We are continuously designing and re-designing our range of products to ensure our customers simple, reliable and robust devices, compatible with the ones provides by other existing companies.



Leaky Feeder

HEAD END:

It is the core of the system. It centralizes several voice and data channels in order to send information through the Leaky Feeder network.



LEAKY FEEDER CABLE:

It allows wireless communication through tunnels, no matter their length as far as it has been continuously installed.



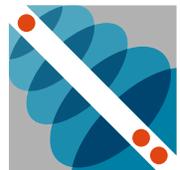
AMPLIFIER:

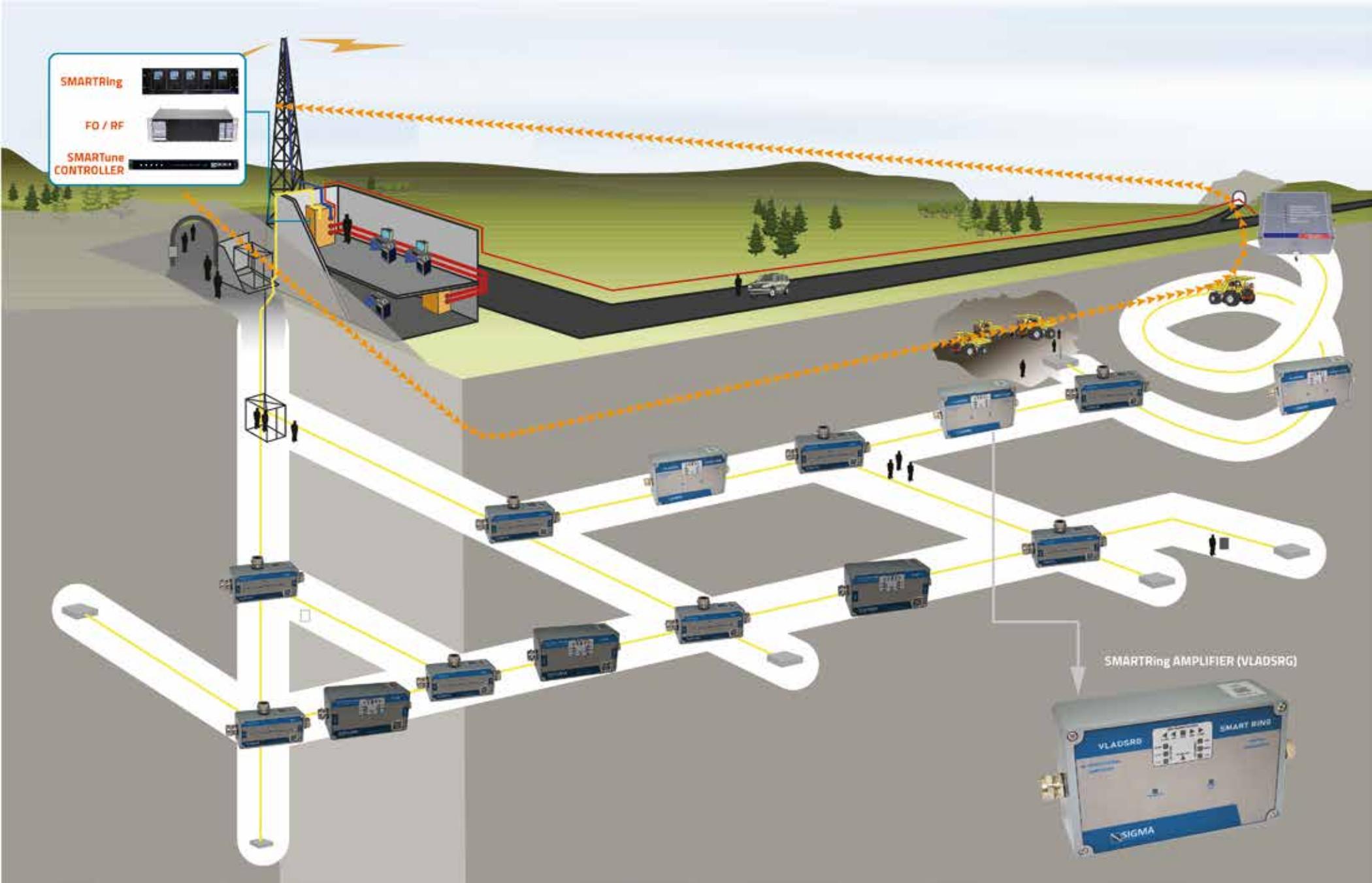
It keeps the signal levels smooth in the Leaky Feeder network to ensure a high communication quality.



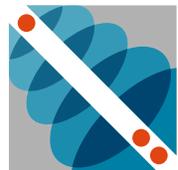
SHUNT:

It branches out the Leaky Feeder network through the differing mine tunnels.

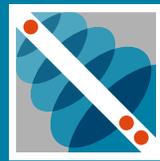




Leaky Feeder SMARTRing: Redundant Leaky Feeder Ring with Fiber Optic



Chile 



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