SELEX
Communications

ELETTRA

THE MOBILE RADIO TETRA SOLUTION FOR PROFESSIONALS

elettra-tetra
Digital Mobile Radio Solution

Higher thinking
FINMECCANICA

Conforming to the ETSI TETRA open standard, ELETTRA provides the essential core services for voice and data calls as well as comprehensive range of supplementary and enhanced services.

These can be customised by operators to meet the specific needs of their market sectors.

SYSTEM USERS

A wide variety of services are available for both fixed and mobile users.

The services can be customised at the operator and user levels to meet all organisation specific requirements.

Typical system users include:

- > ***Police and Security Services***
- > ***Emergency Services (Fire and Rescue)***
- > ***Government Agencies***
- > ***Defence Forces***
- > ***Utilities***
- > ***Fleet Services***

User terminals are suited to professional users and mission critical applications.

They can be vehicle mounted, transportable or hand-portable equipped with keypads or special function keys to call up network services.

In addition, dispatcher equipment can be included within the network either as a stand-alone terminal or as a part of control room facilities.

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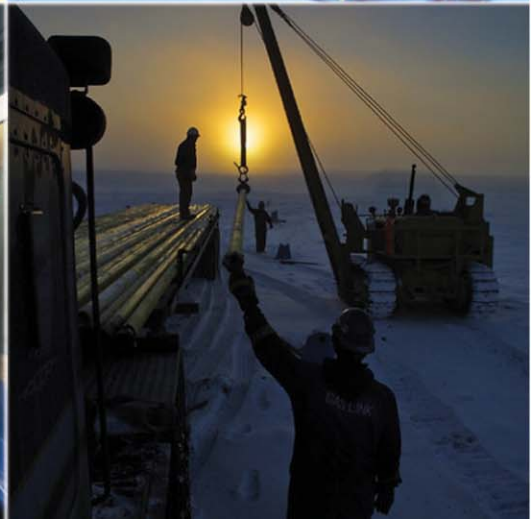


Integrated Voice and Data

ELETTRA provides full integration of voice and data thus exploiting the network bearers and other resources to reduce the transmission costs.

ELETTRA fully supports IP-based applications allowing users access to intranet/internet databases and services from their mobile radio.

Data transmission rates up to 28.8 kbps are available to any system user supporting applications such as file transfer, e-mail and even video transmission to and from mobile users.

ELETTRA supports simultaneous transmission of voice and data between system users so that in time critical situations, decisions can be taken instantaneously.

Security

ELETTRA offers two levels of encryption that can be jointly applied in order to get the highest security level of communications:

- > **Air-Interface encryption** according to ETSI TETRA standard (for protection of communications on the radio link) both with static and dynamic keys.
- > **End-to-End encryption** to provide protection over the whole link among users. Encryption algorithms can either be standard or user specific.

ELETTRA allows TETRA networks to be constructed economically and conveniently, and supports expansion as the need arises.

The architecture is equally cost effective for small systems, with a few hundreds subscribers, and for regional or nationwide systems, supporting hundreds of thousands of users.

ELETTRA is based on a two tier architecture made up of ***Base Stations (BS) and Switching & Control Nodes (SCN).***

The Network is managed by ***Network Management Systems (NMS)*** either co-located at SCN sites or remotely situated.

The BS manages the TETRA air interface to the user terminals.The control element in the BS is the Site Controller Unit which provides an enhanced fallback mode when required.

The ELETTRA BS is able to operate as a drop/insert node hence supporting a wide range of network topologies.

By the insertion of an appropriate sub module, the BS can be further enhanced to operate with an interface unit thus providing local connectivity with Dispatchers, PABX/PSTN and Network Management terminals.

The SCN provides powerful switching and control capabilities for traffic management and interfacing to external telecommunication networks and data hosts. Multiple SCN can be interconnected in order to create wider networks.

IP-based networking is utilised to support routing protocols and to bear control signalling and packet data; voice and circuit mode data are transported over circuit switched links following the same paths and sharing the same links as the IP traffic.

This smart mechanism allows the benefit of IP in terms of:

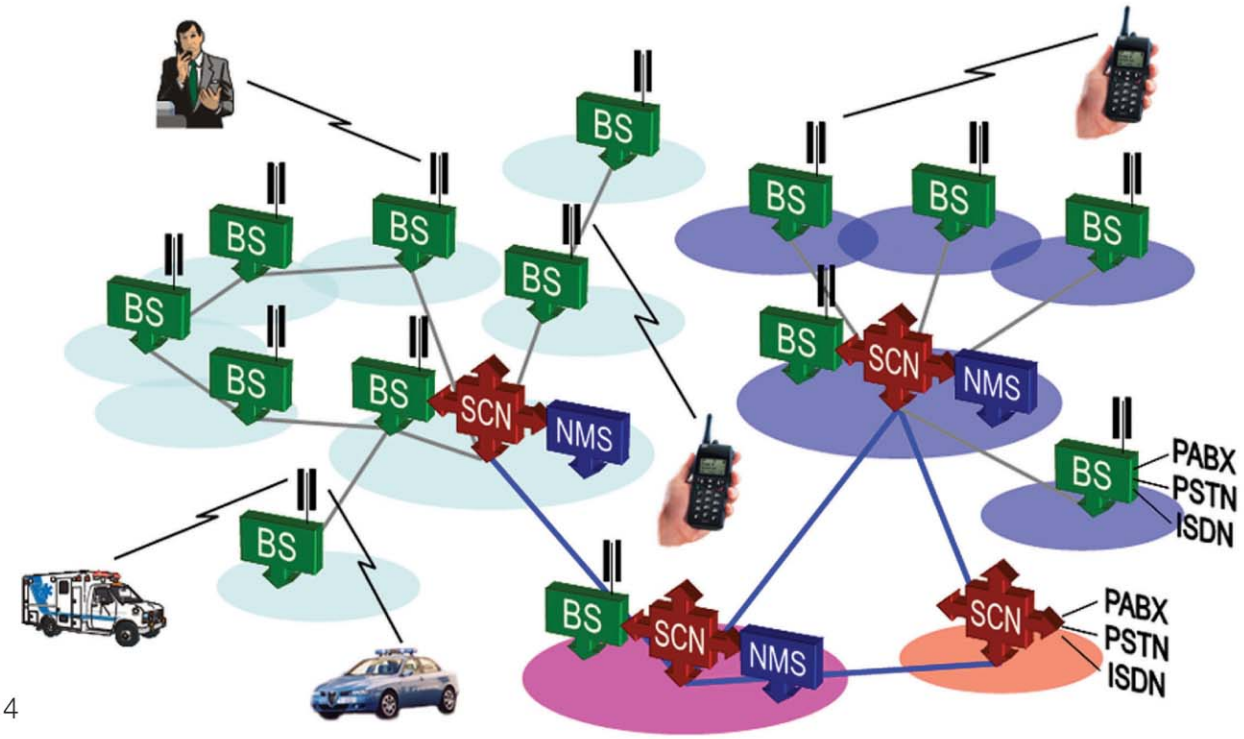
> distributed intelligence
> flat network architecture
> optimised support to IP applications
> alternative routing
> use of state-of-the-art technology and products.

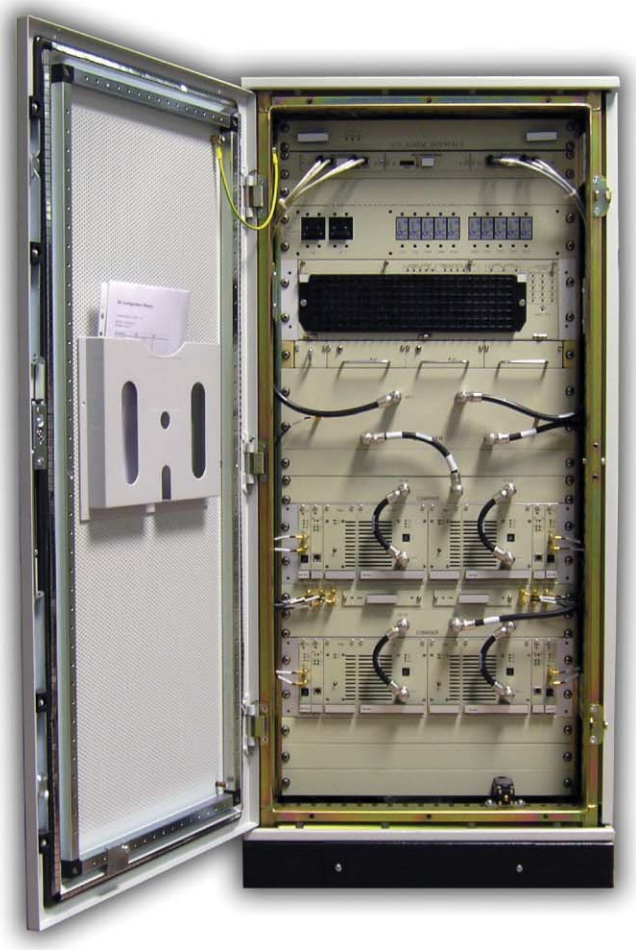
Thanks to this approach ELETTRA does not suffer the voice related IP shortcomings such as:

> lack of VoIP standard for TETRA codec (i.e. use of standard VoIP products requires transcoding; this causes delays and prevents end-to-end encryption)
> need of oversized transport links to obtain acceptable call set-up time and voice quality.

ELETTRA is a family of digital trunked mobile radio p facilities for professional operators and users.

Example of ELETTRA system architecture





Modular in design and supporting speech and data traffic in full and half-duplex modes.

> Controls up to 8 TETRA carriers
> Manages up to 3 independent cells
> Enhanced fallback capabilities (with no need of local GPS receiver) supporting:
  - voice and data individual calls (half and full duplex)
  - voice and data group calls (with late entry and talking party identification)
  - short/status data services
  - priority and emergency calls
  - Air Interface and End-to-End encryption
> Optional redundant configuration
> Automatic protection against RF interference
> Full remote control including remote software downloading
> Easy local maintenance and diagnostics using a standard PC.

roducts that providing a wide range of services and

ELETTRA (SCN): Second level of architecture

ELETTRA's flexible and modular architecture is based on the choice of two state-of-the-art switches.

The SCN-T provides an optimised cost-effective solution for small and low density systems.

The powerful SCN-TX is modular, allowing functionality sharing between separate optimised modules.

Being flexible and expandable, the SCN-TX is particularly attractive for high-density regional and national systems.

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NETWORK MANAGEMENT SYSTEM

A comprehensive set of network management facilities is available within ELETTRA for operations, administration and management of the switching and access networks.

These facilities include:

- ***Network operations*** - Management of the network resources.
- ***Subscriber administration*** - The master database for network users together with its maintenance.
- ***Service management*** - Controlling the service capabilities of individual subscribers and groups and the management of Virtual Private Networks (VPN).
- ***Security management*** - Controlling access rights and confidentiality for individual users and groups.

These management facilities can be physically distributed around the network, replicated for resilience and optionally associated to regions for efficient local management.

System Interfaces and Gateways

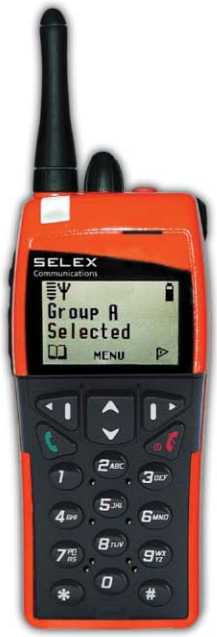
- Analogue PABX/PSTN
- Digital PABX/PSTN
- ISDN (basic and primary rate)
- PDN (TCP/IP)
- Inter System Interface (ISI)
- Despatchers
- Control room

ELETTRA KEY DESIGN FEATURES

- The architecture provides a **cost effective solution** for all system sizes by using two ranges of switches.
- Intelligence is distributed over the network: the Base Stations are provided with a feature rich **fallback option**, including local connectivity to external telephony and data networks.
- The system is available in the: 350-370 MHz (available soon), 380-400 MHz, 410-430 MHz, 450-470 MHz and 800 MHz band.
- The system design is based on minimum link occupancy to reduce transmission costs.
- Control signalling and packet data traffic are **transported over IP** in order to support flat and resilient network architecture. Voice is carried over circuits to guarantee the performance required for a mission critical communication network.
- The system is highly reliable thanks to a full set of redundancy and resilience mechanisms, including **IP-based** alternative routing.
- ELETTRA offers directly connected dispatchers, either stand-alone or integrated in control rooms, that can be easily customised to satisfy the requirements of each specific user organisation.
- The system is based on future-proof design and components.
- ELETTRA fully supports TETRA services, including all data transmission services defined by the TETRA standard hence supporting data transmission rates up to 28.8kbps.
- ELETTRA is **certified for interoperability** with other TETRA equipment vendors.

USER SERVICES

Voice communications:	Point to point: half or full duplex calls Group calls including a wide set of ancillary services Broadcast calls
Data communications:	Circuit mode data Packet mode data Short data service Status messages Supplementary services to enhance voice and data services: - PMR type e.g. call priority (incl. pre-emptive) - Telephony type e.g. call forwarding
Terminals:	High quality hand portable units with encryption, supporting TETRA Multi-slot and Direct Mode capabilities. Use of standard TETRA PEI allows a wide range of data applications from handportables. Powerful mobile terminals with full TETRA functionality including: - Simultaneous voice and data - Multi-slot data - Direct Mode - PEI interface Dispatcher terminals; both line connected and radio connected PC based dispatch facilities



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Printed in Italy. e-P-OT-172/V2/06/X