Systems**Insight**

QUICK REFERENCE GUIDE

sepura

Going further in critical communications
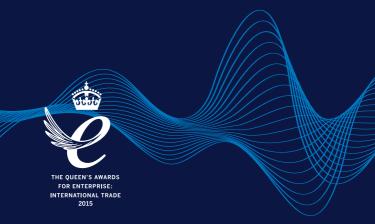
APPLICATIONS

TERMINALS

SYSTEMS

The Sepura Group is a global leader in the design, manufacture and supply of digital radio products, systems and applications developed specifically for business and mission critical communications.

Founded in the UK in 2002, Sepura expanded rapidly across the world with a network of regional partners selling and providing local support for its products, and quickly achieved the status of market leader in over 30 countries.

The Sepura Group now includes Teltronic S.A.U., the Spanish Professional Mobile Radio (PMR) company; and Portalify, the Helsinki applications developer. Operating globally, and with a combined turnover of over €180m, the group has a product portfolio with the unique ability to offer TETRA, DMR, P25 and LTE system solutions.
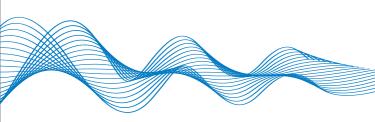
These wide-ranging and complete solutions enable public safety organisations and users in commercial sectors - includingtransport, utilities, oil and gas, manufacturing, mining, hospitality and construction - to address the communications challenges they face on a daily basis.

To find out more, please visit **sepura.com**

THE QUEEN'S AWARDS
FOR ENTERPRISE:
INTERNATIONAL TRADE
2015

CONTENTS

> Network planning and
  coverage prediction

> Network commissioning
  and deployment

> Post-installation support,
  services and training

NEBULA
TETRA SYSTEM ARCHITECTURE

NEBULA TETRA

NEBULA infrastructure for TETRA mobile radio networks delivers outstanding coverage, security and reliability in a platform designed for efficient implementation and cost-effective scalability.

The only 100% Ethernet/IP-based TETRA system available, NEBULA allows the construction of a secure and reliable network with distributed switching and intelligence, complete fault-tolerant redundancy and commercial off-the-shelf (COTS) equipment for lower network costs.

The Switching Control Node (SCN) is responsible for providing intelligence to the network, integrating user settings, and providing access to standard PMR services.

In addition, our Synchronous Data Manager speeds up the transmission of SDS messages in applications such as AVL and SCADA, paring down the entire fleet refresh time.

SCALABLE SOLUTIONS

SEGMENT INTERCONNECTION SWITCH
Upper-hierarchy controller for larger (regional/national)
networks, bringing together up to 64 central nodes,
expanding the system to over 8000 base stations.

AREA SWITCHING CONTROLLER
Mid-hierarchy controller to manage a group of base stations
and their carriers, enhancing network availability and
resilience.

LOCAL SWITCHING CONTROLLER
Local controller within the base station for fallback mode
operation, maintaining full TETRA functionality.

NEBULA's 100% IP design, with IP-distributed network switching, provides:

SCALABILITY
Up to 32 TETRA carriers per base station; up to 128 base stations per System Control Node; over 8000 base stations per System Interconnection Switch
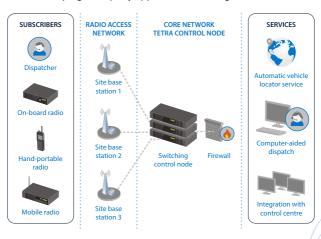
RF PERFORMANCE
Triple diversity; TETRA carrier delivering up to 75W RF output power

RELIABILITY
Hot stand-by redundancy to avoid single point of failure; geographic redundancy

CONNECTIVITY
Telephone gateways for ISDN, VoIP and analogue telephone networks; SDS to GSM; SDS to email; connectivity to external IP data networks; SNMP; comprehensive API interface for developing third-party applications; VoIP digital recorder

SUBSCRIBERS	RADIO ACCESS NETWORK	CORE NETWORK TETRA CONTROL NODE	SERVICES
Dispatcher	Site base station 1		Automatic vehicle locator service
On-board radio	Site base station 2	Switching control node Firewall	Computer-aided dispatch
Hand-portable radio	Site base station 3		Integration with control centre
Mobile radio			

SBS
SITE BASE STATION

With an outstanding 75 watts of RF output power, the SBS delivers the best coverage performance available in TETRA. A fixed unit that allows indoor or outdoor installation, the SBS offers a unique, 100% Ethernet/IP design with support for up to 32 carriers.

Best-in-class receiver diversity, incorporating triple diversity, allows expansion of the coverage area, reducing the number of base stations required to cover a defined area.

![TETRA logo]

MBS
MOUNTED BASE STATION

Easily installed on walls or towers, the IP66 MBS is a complete one-carrier TETRA base station, requiring no ground-based equipment.

Designed to improve coverage in shadow zones, it offers low power consumption and can operate in stand-alone mode or as part of a network. It can also be linked to another MBS to create a two-carrier base station.

PBS
PORTABLE BASE STATION

Designed to be quickly deployable, the PBS – a trolley-mounted MBS variant – can be connected to the NEBULA TETRA Control Node to create a new coverage area, or operate in stand-alone mode as a one-carrier-system, capable of managing radio communications within its coverage area.

DBS
DEPLOYABLE BASE STATION

Compact and transportable, the IP66 DBS is a rapidly deployable two-carrier TETRA base station, ideal for creating a new coverage area, boosting network traffic or replacing collapsed infrastructure in emergency situations.

Operable in stand-alone mode or as part of a network, it can also be linked to another DBS to create a four-carrier base station.

eNEBULA
LTE SYSTEM ARCHITECTURE

The next generation infrastructure for mission critical users, eNEBULA supports TETRA and professional LTE in a single network.

Secure and reliable, it maintains the scalability, RF performance, reliability and connectivity of NEBULA TETRA infrastructure.

eNEBULA LTE
Optimised for professional networks, the LTE infrastructure provides outstanding coverage, security and reliability in a platform designed for efficient implementation and cost-effective scalability.

eNEBULA HYBRID TETRA/LTE
Integrating the access and services provided by TETRA with new broadband services based on LTE technology, eNEBULA allows the construction of a secure and reliable network with distributed switching and intelligence, complete fault-tolerant redundancy and superlative coverage.

eNodeB
LTE BASE STATION

Designed for indoor and outdoor operation in the harshest conditions, the eNodeB is a complete one-box LTE base station that provides coverage in a rapid, cost-effective manner, avoiding costly civil works.

The system includes a complete set of software tools to maintain the unit, even remotely. Intuitive and easy-to-use applications allow the modification of user profiles, system configuration or the checking of network status from a user-friendly Graphical User Interface.

Designed for integration with the eNEBULA system, the eNodeB provides an unrivalled set of LTE services.

EPC
EVOLVED PACKET CORE

The Evolved Packet Core (EPC) enables a reliable IP communication between professional subscribers and critical applications, offering:

› Seamless services for users of hand-portable or mobile terminals and Control Centre operators

› End-to-end Quality of Service (QoS)

› Security and data integrity

› Seamless mobility and handover

› Mission critical multimedia applications, such as broadcast video in uplink and downlink communication

› Deployment options including redundant and high-available configurations

› Management of preemption based on service priorities

The EPC embeds several modules, implemented according to 3GPP LTE standards:

› **Mobility Management Entity**: for location and mobility management of users between coverage cells

› **Serving Gateway**: for traffic routing between LTE base stations and PGW function

› **Packet Data Network Gateway**: for external applications providing broadband LTE services such as CCTV systems, VoIP services and IMS-based applications

› **Evolved Node Controller**: optimises the functionality provided by LTE entities, such as Home Subscriber Server for user provisioning, and Policy Rules Charging Function for service policies and rules, as well as managing user statistics in PMR networks

Compact EPC
TACTICAL EVOLVED PACKET CORE

The Compact EPC provides professional LTE services for emergency deployments, tactical operations and small networks with few LTE base stations.

Offering the same functionality as a standard EPC solution in a single server, it is easily integrated with transportable units or standard eNEBULA cabinets.

The optimal solution for emergency scenarios or tactical operations, the Compact EPC is also ideal for TETRA users wanting to complement the mission critical services of their TETRA network with broadband technology.

NMS
NETWORK MANAGEMENT SYSTEM

The NMS provides an intuitive but powerful tool to configure, monitor and check the performance of all TETRA, LTE or hybrid TETRA-LTE network components.

Built upon a client-server architecture to the FCAPS (Fault, Configuration, Accounting, Performance and Security) industry standard, the NMS allows separate technical and operational management– allowing multiple user groups to share the network, whilst isolating each group's configurable access privileges.

Within geographically dispersed networks, the NMS permits the creation of local maintenance workstations, while maintaining centralised supervision and control.

CECOCO

A communication and control centre application designed specifically for public safety operations, CeCoCo offers an integrated end-to-end solution for NG9-1-1/NG112 combining call attendance, GIS, radio dispatch and computer-aided dispatch (CAD).

CeCoCo's powerful architecture provides cost-effective scalability and enables information sharing between agencies and organisations – critical to providing a quick, accurate and coordinated response in emergency situations.

First responders and support units can depend on high reliability and a fully fault-tolerant architecture, designed to stay up and running – even in the toughest situations.

> **Communications**, allowing operators to communicate with users, regardless of the technology: group calls, emergency calls, ambience listening, text and status messages, call taking and recording, ANI/ALI, ACD queues

> **GIS**: automatic vehicle location (AVL) and geo-fencing

> **Incident management**: providing key information for each event, including real-time CCTV video integration

> **Operational procedures**: proving operator guidance for efficient incident resolution

CECO-TRANS
SOLUTIONS FOR TRANSPORT

Designed specifically for transport environments, CeCo-TRANS provides a fully customisable graphical interface to facilitate easy management of transportation fleets.

A web interface allows information exchange (location, train ID number, etc.) with external applications, such as centralised traffic control centres.

CeCo-TRANS is complemented by our RTP Series range of EN50155-compliant onboard equipment.

SERVICES & SUPPORT

NETWORK PLANNING
AND COVERAGE PREDICTION

In close collaboration with you and your site planners, we can offer the expertise to define your network requirements and ensure effective coverage:

› **RF planning:**

- Coverage prediction

- RF spectrum calculations

- Capacity requirements (number of carriers and overall system capacity)

› **Site survey:** determining appropriate equipment and its location for new installations or migration of an existing system

› **Licensing:** according to specific country or in-house requirements

› **Infrastructure design topography**: defining hardware requirements

NETWORK
COMMISSIONING AND DEPLOYMENT

Working in conjunction with your system architects, site planners or deployment team, we can offer expert guidance to help you achieve the smooth and successful implementation of your network.

Services include:

› System optimisation

› Radio configuration

› Fleet-mapping

› Engineer training

› End-user training

POST-INSTALLATION
SUPPORT, SERVICES AND TRAINING

We offer a comprehensive network management capability –
a cost-effective option that allows you to focus on the needs
of your organisation.

Our flexible packages can be tailored to individual requirements
and give swift access to experienced personnel with unrivalled
knowledge and understanding.

> 24-hour monitoring

> Upgrades

> Repairs

> Support services

> Consultancy

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