# NEBULA TETRA INFRASTRUCTURE

## Services supported

**Mobility management**
Registration/De-registration.
Cell reselection (handover).
**Security class 3**
Authentication (terminal and mutual).
Air Interface Encryption DCK.
Protocols TEA1, TEA2 & TEA3.
Over the air rekeying OTAR.
Enable/Disable.
E2EE, including Line Dispatcher or Telephone Gateway.
**Voice services**
Individual /Group, Semiduplex / Duplex, PABX/ PSTN,
Normal/Priority/Emergency
Multiple group management.
**Main supplementary services:**
Dynamic Group Number Assignment (DGNA).
Late Entry(LE).
Ambience Listening (AL).
Calling Line Identification (CLI).
Talking Party Identification (TPI).
Priority Call (PC).
Preemptive Priority Call (PPC).
Call Retention (CR).
Barring of Outgoing Calls (BOC).
Barring of Incoming Calls (BIC).
**Data services**
Status to individual or group address.
SDS (type 1, 2, 3 & 4) to individual or group address (with or without TL).
Simultaneous Status & SDS data on a voice call.
SCCH Secondary Control Channel.
Circuit Mode Data.
Packet Mode Data.

## Main Technical Features

**Available Links:**
Synchronous:
- E1(G703/G704), V35, ISDN BRI(S/T), G703 codirectional.
Asynchronous:
- Level 2: VLAN, WLAN, WIMAX.
- Level 3: Low level Routers with IRB or L2TP (CISCO routers
from 1700).
**Frequency Bands:**
RX/TX: 350-370, 380-400, 410-430, 450-470 MHz (full band switching)
RX: 806 - 825 MHz / TX: 851 – 870 MHz
**Processors:**
CNC & NMS server: CompactPCI.
Other boards: RISC 32 bits (50 MIPS).
**Transmitter (100% duty cycle)**
Transmitted power: 40 W (46 dBm). Control from 0,6 to 40W in 2db steps
[32 W for the 350-370 MHz band]
Current consumption per carrier:  200W
**Receiver**
Receiver Class A.  Diversity 2 and 3.
Typical Static/dynamic sensitivity: -117,5/-108,5 dBm.
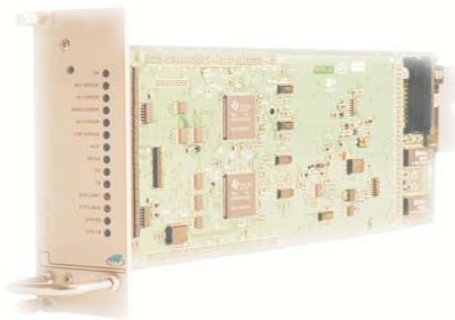**Internal Synchronisation:**
Internal OCXO. Frequency accuracy: 0,2 ppm (11 years maintenance
free)
**Gateways**
PABX / PSTN telephone.
3rd PARTY PORTAL. Enables connection of 3rd party applications.
Enables voice, status, SDS and packet data.
SMS to GSM.
VoIP for Line Dispatcher.
VoIP for Voice Recorder.
Remote maintenance Gateway.

ISO 9001

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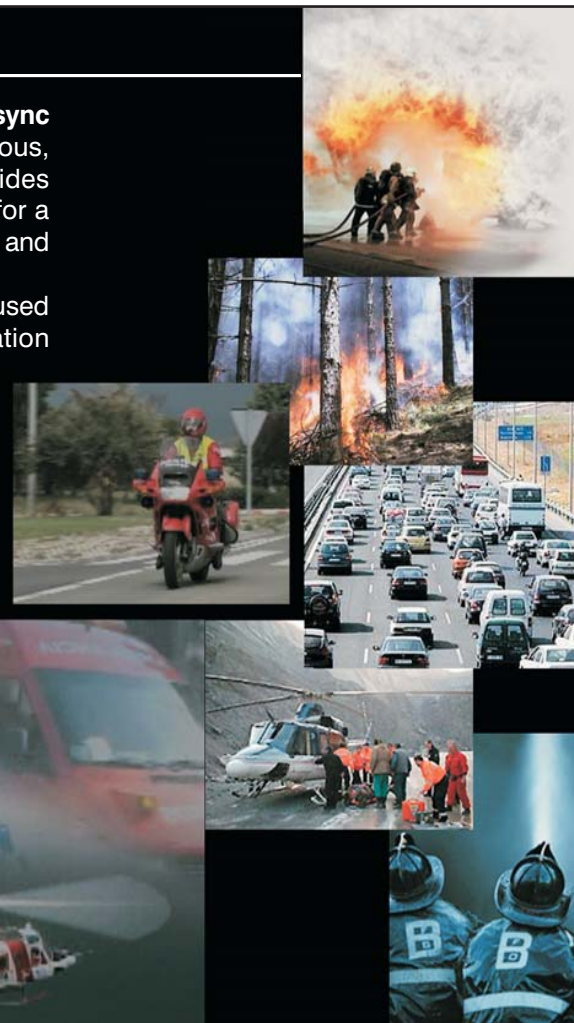
# NEBULA
## TETRA - INFRASTRUCTURE

## teltronic
### professional personal communication



# Modern Ethernet / IP TETRA infrastructure

NEBULA
**TETRA Infrastructure**

## SBS DIAGRAM



## Acronysm

**SCN:** System Control Node
**SBS:** Site Base Station
**CNC:** Central Node Controller
**SNI:** Site Node Interface
**NMS:** Network Management System
**MAM:** Maintenance Alarm Module
**BSR:** Base Station Repeater
**LSC:** Local System Controller
**N2A:** NEBULA IP Interface Access

## SCN DIAGRAM



## ETHERNET / IP Architecture !!

### Distributed Switching

There is no need for a large centralised Hardware Switch, as the switching is distributed by Ethernet. As a consequence the switch capacity is scalable and very flexible. And it´s easier to achieve the level of redundancy required.
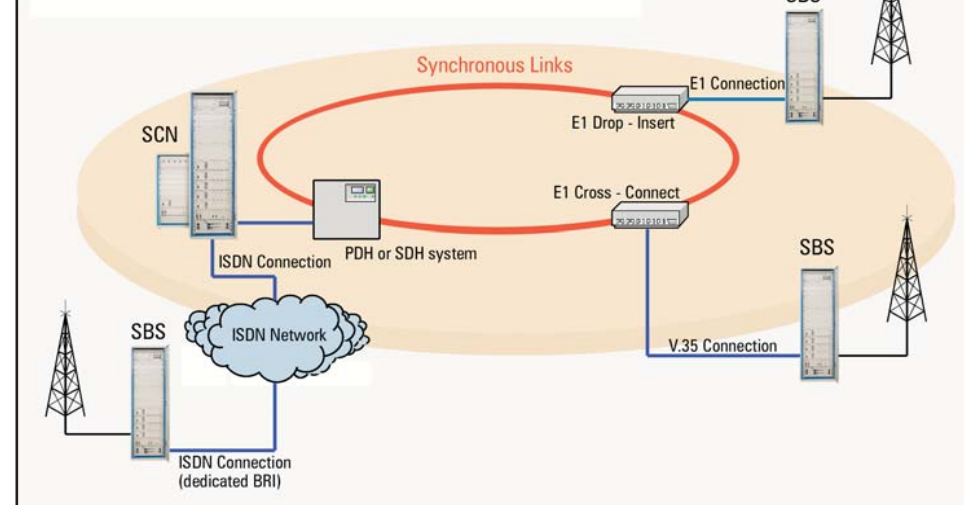
### Distributed intelligence

Intelligent carrier manages the TETRA layer 2, and so enables:
- To support up to 32 carriers per SBS
-And higher CNC capacity Enhanced LSC (Local Site Controller) in Fall Back mode provides full voice and data services with all the local carriers.
Telephone gateways can also be located in SBS, providing distributed telephone interconnection

### No need for GPS or external sync

As only carriers are synchronous, an internal SYNC board provides the synchronisation required for a multisite system (with handover and roaming).
Additionally GPS can also be used as an alternative synchronisation signal.

## EASY & FRIENDLY !!

### Modern VoIP Line Dispatcher & Recorder

Digital & Intuitive Line Dispatcher PC clients, with VoIP connection. Digital & Friendly VoIP recorder.

### Friendly NMS Network management system

NMS permits easy configuration and maintenance of the system, even remotely.

### Hot Swapping & Plug & Play

Insert a new or changing a faulty unit can accomplished in real time.

### TETRA-Portfolio

Teltronic offers a full range of mobile, portable, and dispatcher radio terminals for voice and data transmission, as well as professional solutions based on TETRA technology.
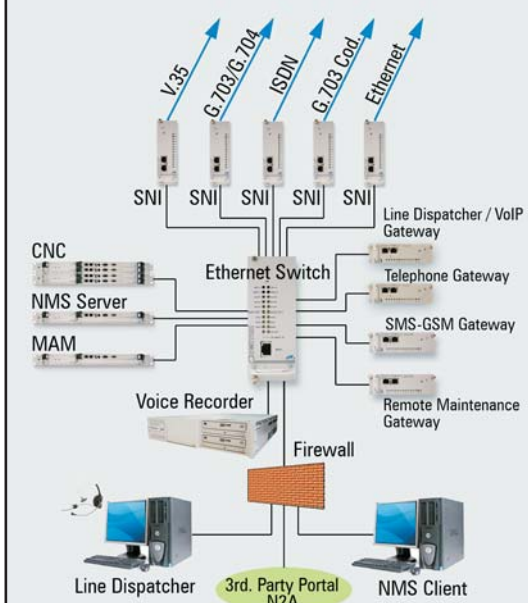
## Synchronous Links



## CONNECTIVITY !!

### Synchronous & asynchronous LINKS (between the node and a site)

As a backbone it´s feasible to use the most standard synchronous links, or as an alternative new, asynchronous possibilities.

### 3rd. PARTY PORTAL

The powerful N2A protocol provides the means to integrate applications from 3rd. party companies, for voice and data.

### Beyond the TETRA technology

With additional features and tools, to be closer to customers and system integrators, reducing the integration time of external applications. For example:
- High efficiency AVL solutions.
- Circuit mode data for broadcasting pictures or low scan video.
- E2EE (end to end encryption)giving highest level of security, including interconnection to Line Dispatchers and Telephone gateways.

## Asynchronous Links