Base station

A resilient, cost effective, flexible and expandable base station

BS414

- **1- 4 carriers in one single 19" rack**
- **Expandable with 2 additional BS41x racks**
- **Redundant base station controller**
- **RX antenna diversity**
- **Support for 4 radio-cells**
- **Tower mounted duplexer and RX amplifier**
- **Cavity or hybrid combiner system**
- **GPS time and frequency synchronized**

DAMM TETRA base station system provides professional mobile radio users and system operators with a resilient and cost effective product conforming to ETSI's TETRA specification.

DAMM base station program is making use of the latest state of the art technology in order to optimize flexibility, reliability and quality and to fulfil high requirements for service availability. By introduction of redundancy schemes of all critical components and a carefully designed architecture the result is a highly robust and cost effective product.

Heavy integration of microprocessor and DSP technology in the transceiver (TR) part and base station controller (BSC) has been deployed giving control of almost all functions and access to a large number of test points.

The extensive use of built-in FLASH PROM for configuration selections and calibration parameters, has eliminated nearly all hard-to-access mechanical adjustments.

The BSC is the heart of the system and by incorporating a mounted switch, pentium PC and co-processors it provides a solid platform for TETRA system vendors to integrate their TETRA functionality and applications on the base station.

Communication channels makes it possible to do software upgrades and download new software and to supervise, diagnostic and control the settings and functionality of the BS414 locally or remotely.

DAMM TETRA base station system fully support Voice+Data services in full and half-duplex modes. This ensures the ability to support a variety of terminals from a wide range of suppliers.

Analogue protocols like NMT or MPT1327 are supported enabling the TR operation mode to be set dynamically from the switch system.

DAMM base station BS414 can be configured with up to 4 TETRA carriers in a 19 inch rack giving in total 16 logical channels with access to all functions and terminals from the front. The BS414 can be extended with additional two racks of either 4 or 8 carriers to a total of 20 carriers. All 20 carriers are controlled from the BSC in the first cabinet, even if the channels are assigned to different radio cells.

The base station system provides support for up to 4 transmit antennas and 2x4 receiver antennas (receiver diversity). It gives the flexibility to configure the system in up to 4 separate sectors with 4 independent sets of TX and RX antennas.

Excellent quality performance and good coverage is obtained by means of using a DAMM tower mounted duplexer (TMD) solution with the possibility to operate with dual diversity, using only two antennas.

DAMM base station BS414 is equipped with one motor tuned cavity combiner or with a special hybrid combiner as requested. Using the hybrid combiner higher insertion loss is recognized. Extremely low power consumption with power supplies that supports the connection to external 100-240 VAC, 47-63 Hz or –48 VDC, n+1 operation and support for external battery back-up characterize DAMM BS414.

The base station system is fully time and frequency synchronized by means of built-in GPS receiver, however the BS414 may also be synchronized via E1 links or by free running using its internal high stability oscillator.

Connectivity for external interfaces to PSTN, ISDN and PDN-gateways is supported.

The technology of BS414

Antenna interface unit

- Complete support for 1 sector
- Dual RX multicoupler for up to 16 carriers
- Built-in DC-feed and alarm for TMA/TMD
- RF test loop converter
- DC control to TMA/TMD for antenna/ amplifier measurements
- Power detectors for forward and reflected TX antenna power

Tower mounted duplexer and RX amplifier

- Dual RX amplifiers for diversity
- Duplex filter to combine TX and one RX antenna
- Tower or ground installed
- Built-in RX antenna return loss measurement feature
- Built-in amplifier measurement feature
- Accepts low-cost thin cables (up to 8dB)
- IP classification code: IP65

Base station controller

- High performance low-power pentium PC
- Windows NT-E operating system
- Solid state flash disk
- Ethernet 10/100 Mbit, RJ45 connector
- Four E1 interfaces 75/120 ohm
- PCM cross connect/switch with 8kBit switching capability
- Automatic switch-over to redundant BSC at failure
- GPS built-in for time and frequency synchronization
- Support for up to 32 carriers
- Support for up to 4 sectors
- Support for up to 2x4 RX antennas
- O&M interface via RS232 and TCP/IP

Power supply

- -48V/-60 VDC or 100-240 VAC input voltage
- +14V/+26V output voltages
- Support for external battery back-up

Transceiver

- Synthesizer channel step of 12,5kHz
- TETRA and as option TETRA / analogue dual mode
- 1-25W in TETRA mode
- 2 to 50W in analogue mode
- Dual RX antenna diversity as standard
- Software update from BSC
- High performance DSP implementation
- Highly flexible software controlled functionality
- Fully GPS controlled synchronous operation

Tower Mounted Duplexer

General

Specification	ETS 300 394-1
Frequency bands	300-310/336-346MHz, 350-360/360-370MHz, 380-390/390-400MHz, 410-420/420-430MHz, 450-460/460-470MHz, 805-825/850-870MHz Other frequencies on request
Filter bandwidth	5MHz, typ., 300-346MHz ~ 10MHz, 805-870MHz ~ 14MHz
Carrier separation	25kHz
TX power before combiner	Max 25W TETRA
TX power ant. connector	10W TETRA, typ.
Receiver diversity	Dual as standard
Cavity combiner system	Motor tuned with support for up to 16 carriers per antenna/cell
Hybrid combiner system	Available as option for max. 4 carriers
Power source	-48 VDC, positive pole grounded, or 100-240 VAC
Dimensions model 21U (HxWxD)	1054 x 542 x 520 mm
Number of channels	1-4
Weight fully equipped	97 kgs
Operational temperature range	-20 - +55 Celsius
Power consumption fully equipped	512W (typ.) for DC-input
IP classification code	IP20