

# Base station

A resilient, cost effective, flexible and expandable TETRA base station

## BS421

- Complete single carrier TETRA base station
- Tower or ground mounted outdoor or indoor unit
- Built-in duplex filter
- Dual RX diversity on two antennas
- Can operate on a single antenna (without diversity)
- Expandable to 4-carriers (four BS421) with jumpers
- -48 VDC operation
- 10/100Mbit/s ethernet interface (including voice over IP)
- Simple, easy and low cost installation

The DAMM BS421 is a single-carrier TETRA base station and is a supplement to the existing 2, 4 and 8-carrier DAMM BS41x TETRA base stations. The BS421 can be used as base stations in large networks in areas where moderate traffic capacity is required (up to 7 Erlang). The BS421 is developed to be used, together with the DAMM SB421 Service Box containing the base station controller software, as platform for small and low cost stand-alone TETRA systems.

The BS421 base station is designed to be mounted in the top of a mast close to the antennas. This eliminates the traditional degradations due to feeder loss and reduces the cost considerably. It is also ideal as a movable base station mounted in a truck or on a ship. It is designed for harsh climatic environmental conditions and is fully IP65 sealed.

The BS421 is provided with full dual RX diversity for optimal sensitivity, and has a builtin duplex filter with an output power to the antenna connector of up to 10W. With the elimination of the normal feeder loss it has a Radio performance superior to most other available solutions.

The BS421 is designed for two antennas, one for TX and RX-A and another for RX-B. If antenna positions are limited the BS421 base station can run on a single antenna only (without diversity). In addition, the BS421 is provided with an extension feature, which allows two BS421 to be connected with just two additional jumper cables and still run with full diversity on two antennas.

The BS421 is provided with an internal GPS receiver used for time and frequency synchronisation. This allows the BS421 to run full time synchronous with other base stations for optimum cell-reselection. External GPS sync input and output signals allow up to four BS421 to be synchronised from a single GPS antenna

and allows external synchronisation in e.g. tunnels and other areas where GPS signals cannot be received.

The BS421 also support discontinuous transmission fully GPS synchronized. For normal systems this allows a dramatic decrease in power consumption, as only the control channel timeslot and active traffic timeslots need to be powered. It also allows base stations with data-only in the control channel to share the same frequency in 4 overlapping cells. The BS421 is connected to external units with a pre-mounted system connector with just one -48V DC power cable and one standard category 5/6 LAN cable.

The BS421 contains the latest generation of DSP and processor technology and operates under the Windows CE.Net real-time operating system. It is designed for a fully IP based solution including support for Voice-over-IP.

The BS421 is provided with a special RF test loop functionality, which allows remote test of the RF parameters, including RX antenna return loss and RX sensitivity.

The IP connectivity allows remote diagnostic, test and software update. Windows desktop, file transfer, SNMP and the OM interface are remotely available.

The DAMM BS421 supports terminals from a wide range of suppliers and complies with the ETSI ETS 300 392 and the TETRA MoU TIP specifications.



The BS421 is optimised to work together with the DAMM SB421 Service Box, which contains the base station controller software, a AC rectifier providing -48V DC for up to two BS421 base stations. Please request the product sheet for SB421.

# The technology of BS421

## Frequency bands

Russia	RX=300-310MHz, TX=336-346MHz, BW=10MHz
China	RX=350-360MHz, TX=360-370MHz, BW=5MHz
Public safety	RX=380-390MHz, TX=390-400MHz, BW=5MHz
Civil	RX=410-420MHz, TX=420-430MHz, BW=5MHz
450MHz	RX=450-460MHz, TX=460-470MHz, BW=5MHz
FCC	RX=805-825MHz, TX=850-870MHz, BW=14MHz
	Others frequencies on request.

## Transmitter and Receiver

TX power at antenna connector	0.5W to 10W TETRA remotely adjustable
RX sensitivity	-121dBm with diversity (-118dBm without diversity)
RX sensitivity static	-118 dBm
RX sensitivity dynamic	-113 dBm
Receiver Diversity	Dual as standard
Built-in duplexer	Combines the TX antenna and one RX antenna
Time and frequency sync	Internal or external GPS
TX power measurements	Forward and reflected
RX sensitivity BER measurement	With built-in RFTL, -122 to -104dBm
RX antenna return loss measurement	With built-in RFTL feature

## Antenna Connections

Minimum antenna setup	One antenna (no diversity)
Normal antenna setup	Two antennas (dual diversity)
Antenna setup for two BS421	Two antennas (dual diversity)
GPS antenna	Active (+5V DC) or passive

## Interface

CPU	324MHz MIPS
Operating system	Windows CE 5.0 Net
Storage	Solid-state flash disk
Ethernet	10/100 Mbit/s
Synchronising	1 sec. In- and Output
Alarms	SNMP
O&M	Damm O&M via TCP/IP

## Power Supply

Power source	-48V DC, input galvanic isolated
Power consumption	75 W at 10W TETRA (typical)

## General

Specification	ETS 300 394-1
Dimensions model (HxWxD)	333 x 246 x 165 mm, inclusive mounting bracket
Weight (incl. Mounting accessories)	9 kg
Wind area	0.08 sq. m
Storage temperature range	-40 to +55 Celsius
Operating temperature range	-25 to +55 Celsius
Encapsulation	IP65

