

TETRA – Revolutionising the way the world communicates



## EBTS

### Enhanced Base Transceiver System

The Dimetra EBTS provides the TETRA RF link between the Switching and Management Infrastructure (SwMI) and the mobile radio terminals of the Dimetra system.

With reduced power consumption and improved serviceability the EBTS design accommodate easy installation, commissioning and maintenance.

# Dimetra EBTS consists of four sub-systems:

- TSC: TETRA Site Controller
- BR: Base Radio
- EAS: Environmental Alarm System
- RFDS: Radio Frequency Distribution System

Dimetra EBTS site equipment also includes an external or internal GPS synchronisation system, power supply sub systems and X.21 or E1 bearer circuit terminations. The EBTS is incorporated in a 1.85 m cabinets with lockable doors. Various configurations are available to meet capacity requirements ranging from 4 to 96 logical channels. The cabinet has front module access and top cable entry. Cable connections are accessed via a junction panel on the top of the cabinet. An EBTS cabinet can accommodate up to 4 BRs (16 logical channels) with RFDS.

To increase channel capacity (up to 32 logical channels in the omnisite and up to 96 in a 3 sectors site) additional cabinets with the appropriate number of BRs and associated RFDS equipment can be added. Primary power for the standard EBTS is 48 VDC (positive earth). With the use of external equipment, the EBTS can also operate from a variety of AC or DC power sources. The EBTS offers now an extended temperature range, from -20° to +55°C.

## Base Radio (BR)

The BR is modularised, with separate modules for Power Supply, Exciter, RF Power Amplifier, Receivers and Base Radio Controller.

There are two types of BR, one with 15 watts, the other with 25 watts output power, each of them being down adjustable. The Dimetra BR provides 4 logical channels on 25kHz spaced RF channel assignments.

The Dimetra Base Radio incorporates diversity reception for increased 'talk-back' range, performance and reliability. The configuration provides a 2 or 3 receiver diversity choice. All receivers in a BR operate on the same frequency.

Front panel indicators on the Base Radio Controller provide visual status and operational condition of the BR.



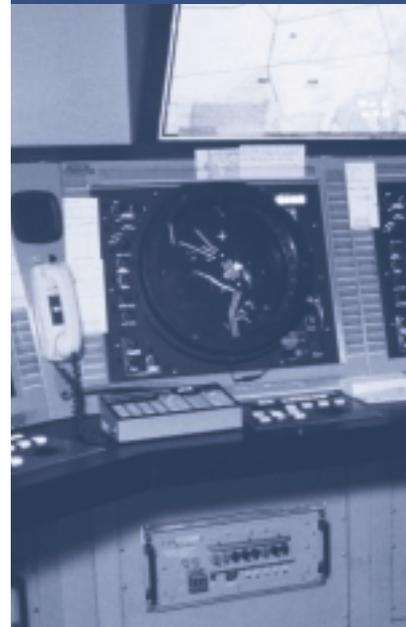
Base radio

## TETRA Site Controller (TSC)

The Dimetra TSC provides the X.21 and E1 remote interface to the TETRA network and controls the EBTS site operation over an Ethernet link. A TSC controls up to 8 BR = 32 logical channels for the omni site, 24BR = 96 logical channels for the 3 sector site. The TSC provides local site trunked operation and management in case of infrastructure link failure.

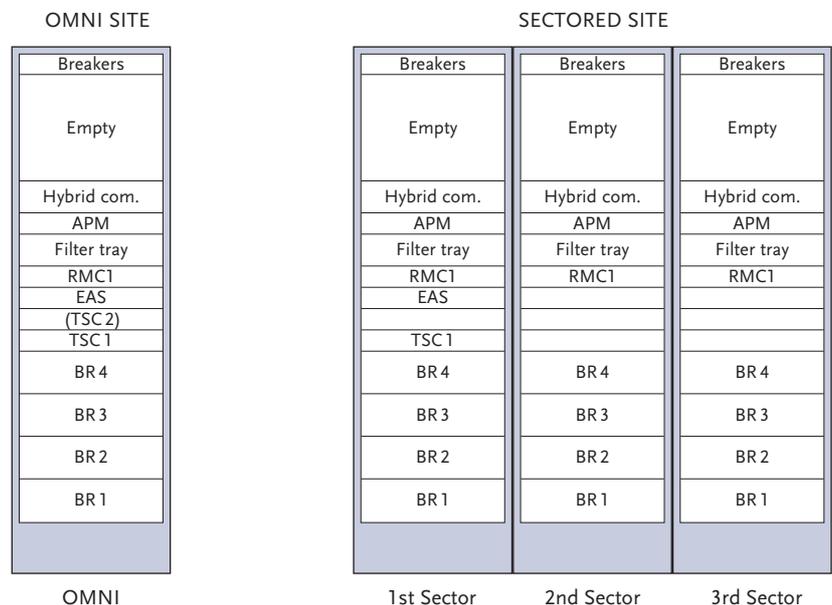
The Dimetra TSC contains an SRI (Site Reference ISA) time and frequency reference function. This includes a high stability oscillator which provides the frequency reference and a GPS receiver providing the timing reference. The GPS reference is used to train the oscillator, which eliminate ageing and achieve a higher stability.

The TSC provides an alternative input for remote GPS receiver. TSC redundancy is an optional feature that provides increased site availability.



### Example 1: Dimetra EBTS for hybrid combiner [max. configurations]

TETRA Racking Diagram PR3



# TETRA Site Controller



## Environmental Alarm System (EAS)

Each Dimetra EBTS incorporates an EAS to provide remote control functions at the EBTS site. The EAS provides a total of 48 inputs for monitoring EBTS functions and radio site environmental conditions such as intruder alarm and primary power failure. Up to eight outputs are provided to enable remote control functions such as main/standby BR operation and standby generator start up.

## Radio Frequency Distribution System (RFDS)

The Dimetra RFDS is able to combine BR transmitter RF outputs for single transmit antenna operation per each cabinet.

To keep capital costs down, we can now offer hybrid combiners for different antenna configurations.

Cavity combining is utilised to reduce insertion loss, maximise RF power dissipation and increase channel capacity.

For example the modular and scalable automatic transmit cavity-combining system can tune itself to EBTS operating frequencies which ease the installation and the future expansion of the system.

The nominal minimum frequency separation for cavity combining is 150kHz. The EBTS provides receiver diversity which increases inbound sensitivity. A receiver multicoupler tray amplifies and distributes the received signals from 2 or 3 diversity antennas to the Base Radio receivers.

The EBTS is available with different filter tray combinations all containing internal duplexer. The duplexer allows combining RX and TX on one antenna saving one antenna per EBTS.

A large choice of receiver diversity combinations with duplexed or non duplexed antenna systems are offered to meet different customer needs.



### Example 2: Dimetra EBTS Racking Diagram with cavity combiner versions [max. configuration]

TETRA Racking Diagram PR3

OMNI SITE		SECTORED SITE					
Prime Rack	Expansion Rack						
Breakers							
Tx Combiner Slave							
Tx Combiner Master							
APM	(APM)	APM	(APM)	APM	(APM)	APM	(APM)
Filter tray		Filter tray		Filter tray		Filter tray	
RMC 1	RMC 2						
EAS		EAS					
(TSC2)							
TSC 1		TSC 1					
BR 4							
BR 3							
BR 2							
BR 1							
OMNI		1st Sector		2nd Sector		3rd Sector	

# EBTS

## Enhanced Base Transceiver System TETRA 380–400 MHz/403–433 MHz

### General

Dimensions HxWxD	mm	Prime/expansion rack: 1850 x 600 x 600 Base Radio: 222 x 483 x 425
Weight EBTS (4 BRs) Base Radio	kg	300 max. 34
Power Supply	V DC	–48 (positive earth)
Power Consumption EBTS (4 BRs with 25W), TSC with 2 Rx and EAS EBTS (2 BRs with 15W), TSC with 2 Rx and EAS Base Radio 25W Base Radio 15W Site Controller EAS Auto Tune Combiner Hybrid Combiner	Watts	(at 48 V DC) < 1800 < 700 8.5 A @ 48 VDC 5.8 A @ 48 VDC 1.3 A @ 48 VDC 0.3 A @ 48 VDC 0.9 A @ 48 VDC 1.1 A @ 48 VDC
Operating Temperature	° C	–20 to +55
Bearer circuit termination		X.21 or E1, N x 64 kbps

### RF Specifications

Frequency Band	MHz	380–400, 403–433
Operating Bandwidth	MHz	5
Transmitter/Receiver Separation	MHz	10, TX High
Tx – Tx spacing	kHz	150 (min)
Transmitted RF Power at output of EBTS per Base Radio per Base Radio	Watt	25 max. (adjustable) 15 max. (adjustable)
RF Power Control	dB	12 (in 1 dB steps)
Receiver Sensitivity at EBTS input connector static 4% BER (typical) faded 4% BER (typical)	dBm dBm	–117.5 –108.5
Antenna Diversity Gain (Highly dependent on antenna configuration and propagation environment)	dB	3–5 (2 receiver) 5–7 (3 receiver)

All specifications use the ETS 300 394-1 method for measurement. All values subject to change without notice.

#### Important Note

The features and facilities described in this brochure should be used for indicative purposes only. Availability of features and facilities will be dependent on Motorola's scheduled product development programme.

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