

# T-MATRIX™ P



## PORTABLE TETRA SOLUTION

HUMANITARIAN OPERATIONS

PEACE-KEEPING MISSIONS

CRISIS MANAGEMENT

MILITARY OPERATIONS

NATURAL DISASTER RELIEF

COVERT OPERATIONS

SPORTING EVENTS

PUBLIC EVENTS

TEMPORARY COMMUNICATIONS

# T-MATRIX™ P

T-MATRIX™ P is a compact, cost-effective, Transportable TETRA over IP (ToIP) communications solution. It provides exceptional value for the small user looking for a simple but feature-rich system and it represents a considerable advance on our competitors' products.

The T-MATRIX™ P transportable system can also be used as a basic building block to which additional sites and features can be added to construct a larger or more comprehensive system.

The modular design offers either a single transceiver, providing three traffic channels and one control channel, or two transceivers providing seven traffic channels and one control channel.

The equipment is mounted in a transportable ruggedised 14-unit or 20-unit 19-inch rack, depending on the number of transceivers. Additional Gateway options are mounted in matching racks as required.

Although this portable design is primarily intended for the small user it can be upgraded to provide a full system capability, enabling customers to expand the number of transceivers should they wish to increase the traffic capacity at the site. Alternatively additional radio sites can be added to increase geographical coverage.

Larger single-site configurations are also available, offering three to six transceivers housed in 43-unit racks. For further details please refer to our T-MATRIX™ P product brochure.

## ADVANTAGES

- TETRA-over-IP flexibility
- Available in most TETRA Bands
- AC or DC Operation
- Transportable
- Advanced Functionality
- Supplied pre-configured
- Self-contained
- Upgradeable
- Smart Robust Rack Case
- Reliable
- Ruggedised Design
- Cost-effective
- Modular

## BASIC SYSTEMS

### OPTION 1:

#### Basic T-MATRIX™ P Single Transceiver Site consisting of:

- A robust transportable vibration-limiting 19" Rack Case.
- An RF Sub-system comprising a Duplexer, LNA and Rx Splitter.
- A single modular-design Transceiver, providing three traffic channels and one control channel.
- A TETRA Radio Site Equipment Controller (TSC).
- An Input Panel with 48V DC and 230V AC input connectors and 4-way fused DC Distribution.
- A compact AC power supply module (480W) with integral DC standby switching.

### OPTION 2:

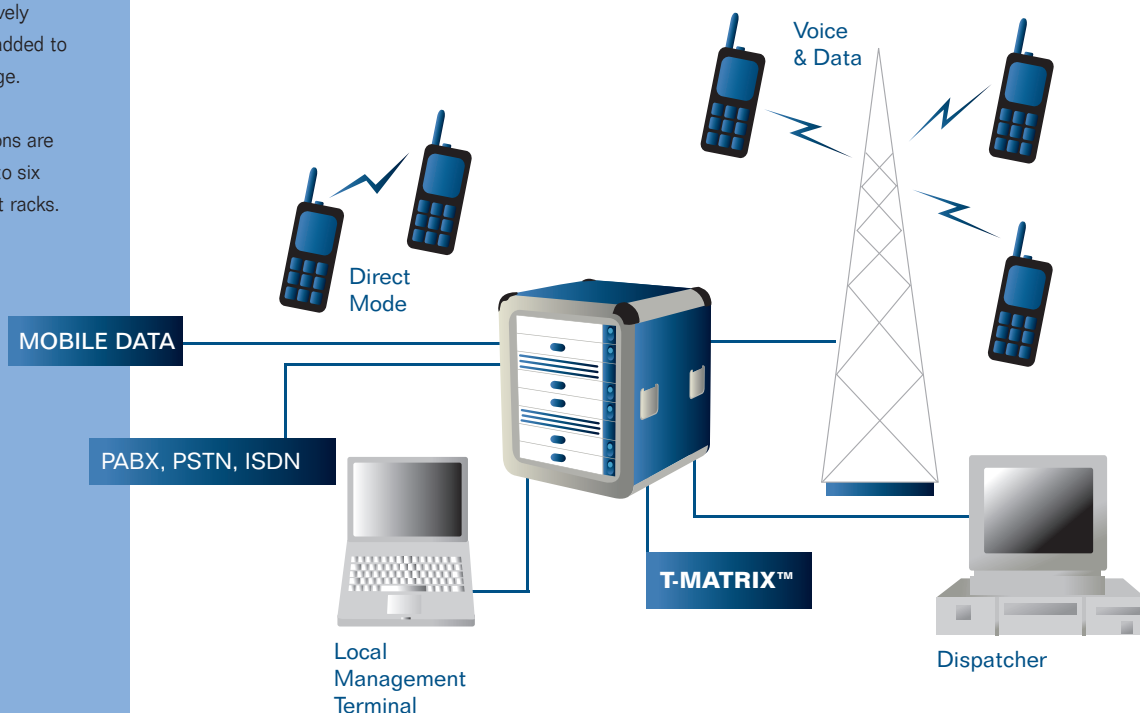
#### The Basic T-MATRIX™ P Dual Transceiver Site consisting of:

- A robust 20-unit transportable vibration-limiting 19" Rack Case.
- An RF Sub-system comprising a Tx Combiner, Duplexer, LNA and Rx Splitter.
- Four modular-design Transceivers, providing a total of fifteen traffic channels and one control channel.
- A TETRA Radio Site Equipment Controller (TSC).
- An Input Panel with 48V DC and 230V AC input connectors and 4-way fused DC Distribution.
- A compact AC power supply module (480W) with integral DC standby switching.

### Rack Case Features:

The Rack Case housing T-MATRIX™ P equipment is made from aluminium honeycomb with a toughened outer skin (ABS) and has removable covers front and rear.

The front cover has brush-strip cable entry, two vents, and is interchangeable with the rear cover, which has four vents. There are lifting handles on each side and rubber buffer feet on the base, which can be removed and replaced with (optional) wheels if required.



## EXPANSION

The following additional equipment is available to expand the capability of the standard

T-MATRIX™ P solution:

- Management Terminal
- Dispatcher
- Telephony Gateway
- Data Gateway
- SDS Gateway
- Automatic Vehicle Location (AVLS)
- Additional Sites

## FUNCTIONALITY

T-MATRIX™ P supports the basic TETRA voice and data services and, where applicable, more advanced services, depending on the additional equipment options specified. See the table on the opposite page for further information on functions available on the basic T-MATRIX™ P package and on expanded systems.

For additional information on gateways and multi-site configurations, please refer to the T-MATRIX™ F product leaflet.

# T-MATRIX™ P SYSTEM FUNCTIONALITY

## TETRA SERVICES

### Basic Services

Individual Call full and half duplex  
Unacknowledged Group Call  
*Broadcast Call\**

### Circuit/Packet

Data supported

### Call Clearance

User Initiated disconnection  
Preset Call limit and Tx  
Inactivity Timer

### Short Data Service

(Individual and Group)  
Pre-defined Status Message  
User Defined Type 4 SDS  
Concurrent SDS + Voice

### Queuing

Queue call when system resources busy

### Facilities

Basic Link services

### Trunking

Late AI Traffic Assignment  
*Early Network User Channel Assignment\**  
Message Trunking

### Dialling

ISSI/ITSI Dialling  
*PSTN Dialling\**  
*DTMF Over-Dialling from PABX\**  
*DID Dialling from PABX Gateway\**  
*MS ITSI Dialling from PABX\**

## SUPPLEMENTARY SERVICES

### General

Late Entry  
Emergency Call  
Priority Call  
Pre-emptive Priority Call  
Talking Party Identification  
Access Priority  
*Ambience Listening\**  
*Dynamic Group Number Assignment\**

### Telephony type

Calling Line Identification  
Presentation  
*QSIG Calling Pty ID Presentation\**

## MOBILITY

### Registration Procedures

Mobile Initiated registration and de-registration  
*Undeclared and Unannounced Cell Reselection\**  
*Announced Type 3 Cell Reselection\**  
(Handover)  
*Call Restoration\**

### Attach/Detach Group Identities

Attach/Detach of Groups (MS Initiated)  
*Group Management\**

### Energy economy mode

Energy Group 0

### Facilities

*Network Broadcast Information\**  
*Neighbour Cell information\**

## SECURITY

### Encryption

*AI Encryption Static Cipher Key\**  
*Algorithm TEA1, TEA2\**

### Authentication

*Algorithm TAA\**  
*Authentication K Management via NMS\**

### Terminal Security

*Permanent Disable\**  
*Temporary Disable / Enable\**

## SYSTEM INTERFACES

### Gateways

*Telephony Gateway\**  
(PABX, PSTN, ISDN, Analogue)  
*Data Gateway\**  
*SDS Gateway\**  
*Analogue Gateway\**

### Radio Site to Network

*E1 / G703\**  
*X.21\* ATM\**

## NETWORK MANAGEMENT

### Fault

*Alarm Logging and Management\**  
*Equipment Monitoring\**  
*External alarms\**

### Configuration

*Site configuration\**  
*Database management\**  
*Radio Site Software download\**

### Account

*Call Data Records\**

### Security

*NMWS Operator Access Rights\**  
*Subscriber Access Rights Management\**  
*Encryption Key Management\**

### Subscriber

*Addition/Deletion/Modification\**  
*Enable/Disable\**  
*Provide, modify and withdraw Supplementary Services\**  
*Barring of incoming and/or outgoing calls\**  
*Call Forwarding\**

## NETWORK CONFIGURATION

### Capacity

Scalable in excess of 128 Radio Sites

### Accessories

*Call Logging\**  
*IP Dispatchers\**

### Flexibility

*Various Redundant Configuration Options\**  
*Fault Tolerant Architecture\**  
*Control Channel Agility\**

# T-MATRIX™ P TECHNICAL DATA

## GENERAL SPECIFICATIONS

**Operation**  
Full RF Duplex, supporting full duplex and half duplex speech and data calls

**Scalable**  
1 - 4 carriers through T-MATRIX™ P

**Channel Spacing**  
25kHz, 6.25kHz offsets

**Available Frequency Bands**  
370-390MHz (Base Rx)  
380-400MHz (Base Tx)

380-400MHz (Tx & Rx)

410-430MHz (Tx & Rx)

450-470MHz (Tx & Rx)

806-825MHz (Base Rx)  
851-870MHz (Base Tx)

## RECEIVER SPECIFICATION

**Receiver Class**  
Class A, satisfies ETS300-392-2

**Static Sensitivity**  
<3.0% BER for TCH 7.2 at -115dBm

**Dynamic Sensitivity**  
<2.5% BER for TCH 7.2 at -106dBm (typical urban conditions at 50 kph)  
<4% BER for TCH 7.2 at -106dBm (hilly terrain conditions at 200 kph)

**Diversity Operation**  
Fully independent receivers – digitally combined for maximum likelihood detection

**2-way Receiver Diversity Gain**  
2dB minimum, 5dB typical. Exact gain depends on antenna configuration and fading conditions

**3-way Receiver Diversity Gain**  
3dB minimum, 7dB typical. Exact gain depends on antenna configuration and fading conditions

## RF SUB-SYSTEM SPECIFICATION

**LNA and Hybrid Combiner Band**  
370-470MHz,  
806-870MHz

**Duplexer Filter Bandwidth**  
5MHz Pass band for TX and RX Filters and 5MHz stop band (typical, can vary with band)

**TX to RX Isolation**  
>80dBm

**Duplexer Spacing**  
10MHz (typical) at 370-470MHz  
45MHz (typical) at 800MHz

**Duplex Filter Insertion Loss**  
<1.1dB

**Duplex Filter Out-of-Stop Band Isolation**  
>60dB to 3GHz

**Hybrid Combiner Insertion Loss**  
<3.5dB (2 port combiner)  
<7dB (4 port combiner)

**Hybrid Combiner TX-TX Isolation**  
>45dB

**Hybrid Combiner 2-Tone Intermodulation**  
-65dBc

## ENVIRONMENTAL SPECIFICATION

**Operating Temperature & Humidity**  
(Transceiver)  
Compliant with ETSI EN 300 019-2-3  
Full rated operation from -20°C to +55°C  
Up to 90% humidity, non-condensing

**EMC**  
Compliant with ETSI EN 300 827

**Safety**  
Compliant with ETSI EN 60950:2000

**Water and Dust Resistance**  
Compliant with IEC529 rating IP20  
Low maintenance design (includes no routine maintenance of fan tray).

## POWER SYSTEM SPECIFICATION

**Input Voltage**  
48 Volts DC nominal  
230 Volts AC nominal  
  
110 Volts AC nominal (option instead of 230V)



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