



MOTOROLA TETRA SOLUTIONS

Technology That's Second Nature™



HOW HAS MOTOROLA BECOME THE WORLDS LARGEST SUPPLIER OF TETRA?

We believe it's a constant focus on the lives of business critical and mission critical workers and we call it 'design for use'.



For decades, Motorola has embraced two principles – Design and Usability - as a defining approach to bring to market more effective products and solutions for mission critical users. Design-for-use means providing solutions that assure Technology That's Second Nature. This means that they should be intuitive and easy to use so users can focus on completing their missions. Their interaction with the technology and the device needs to be designed to be usable during all stress levels. For this purpose, the DI team immerse themselves into the lives of end-users to better understand behaviors and motivations.

'Design for use' in action

Motorola was the first to locate the emergency button on its radios at the bottom of the antenna or to locate without even looking down at the radio in an emergency. An angled knob that is easier to operate with a gloved hand and the angled "bump" on the side of the radio for easier grip. Large 'Push To Talk' controls need to be located just right for the centre of gravity. Rotary controls for volume and channel are separated for ease of access. Control buttons are exaggerated and tactile so they can be easily found.



Supporting the TETRA world since 1996

**FOCUSING ON YOUR MISSION
FOCUSING ON YOUR OPERATION**



TETRA Infrastructure, from Nationwide to Localised systems

Motorola have delivered more TETRA infrastructure than anyone else. We have won the last 6 nationwide public safety TETRA contracts awarded. Solutions from small, single site deployments to large nation-wide solutions with many hundreds of sites.

Motorola is the leading supplier of TETRA small system solutions. Only Motorola have a proven track record of installing scalable TETRA Internet Protocol (IP) infrastructure.



POLICE

"After an open tender process, it was clear that upgrading our TETRA terminals to the Motorola MTP850 would meet our needs both today and in the future"

John Meldrum,
Northumbria Police



Motorola - a history of firsts'

- 1996:** Awarded world's first ever TETRA contract (Gardermoen Airport)
- 1997:** The first demonstration of a 'group call' took place using Motorola TETRA equipment with another manufacturer
- 1999:** The first trial system to demonstrate voice and short data took place in Hungary using Motorola TETRA equipment
- 1999:** Won the contract to deliver Airwave's TETRA networking the UK, the world's largest TETRA communication system
- 2000:** Won first commercial 800MHz system in Hong Kong
- 2000:** First to supply TETRA compliant Air Interface Encryption to the Basque Government
- 2001:** First IP based TETRA radio system
- 2002:** First 800MHz public safety project for FIFA world cup in Korea
- 2002:** First implementation of TETRA Authentication
- 2003:** Selected to provide the TETRA communications system for the Athens Olympics
- 2003:** First with TETRA compliant Class 3 encryption
- 2004:** C2000 (NL), first encrypted TETRA nationwide mission critical network for all Emergency Services
- 2005:** First mass rapid transit system upgrade to TETRA in Asia to Singapore Mass Rapid Transit
- 2006:** Airwave and Motorola sign world's first commercial contract for TETRA PDAs
- 2006:** First fully operational high speed rail TETRA deployment in the world in Taiwan
- 2007:** Awarded first ever contract for Norwegian nationwide public safety system which included commitment to deliver TETRA 2 High Speed Data
- 2007:** First 350 MHz TETRA deployment in China for Beijing Border Police
- 2008:** Introduced the world's smallest TETRA terminal (TCR1000)
- 2008:** Showed TETRA base station with new innovative fuel cell solution at TWC08
- 2009:** First TETRA vendor to ship 1,000,000 terminals

Services

Motorola offers a comprehensive and flexible portfolio of services to ensure peak performance, cost effective operations and high availability throughout the full lifecycle of the system.

- Integration Services - from initial concept through system planning and design to implementation and integration
- Support Services - ranging from standard network and terminal support services to value added services such as performance monitoring, security and optimisation services
- Managed services - designed to meet the needs of our Mission Critical customers

Applications for Enhanced Situational Awareness

To deliver highly tailored solutions for our customers, we work with technology partners that are leaders in their field of expertise. Leveraging the integrated voice and data capabilities of TETRA, our solutions include video surveillance, personnel and vehicle tracking and a variety of tools for enhanced situational awareness.

- **Messaging**
- **Location**
- **Command and Control**
- **Asset Management**



AIRPORT

"The upgrade decision... was a straightforward one, given the long relationship we enjoy with them and the trust we have established regarding the high quality of its products and services"

Tore Myhre,
Oslo Lufthavn AS



FIRE

"We've a proven track record of working with Motorola since 2000 on the Airwave network, which is one of the largest public safety networks in the world"

Pete Richardson,
Airwave



PETROCHEMICAL

"Most of all, we selected Motorola's TETRA system and explosion-proof radio for safe & reliable comms in potentially explosive environments such as oil and petrochemical plants"

Mr Jin-Young Park,
SK Energy



GOVERNMENT

"We were impressed with the proven voice and data capabilities"

Manu Zarragoitia,
Bilbao Municipality



TRANSPORTATION

"As the international market leader in PMR (Private Mobile Radio) communication, Motorola has a proven heritage in providing successful and effective solutions"

Anton Tomov,
ATRON electronic GmbH

TERMINALS YOU CAN TRUST

We test our terminals in our labs, not on our Customers

Motorola has been designing Mission Critical Communications for over 70 years and if there's one thing we've learned it's that Public Safety is a tough place to be.

Not just in the obvious places, like the fires or the major incidents, but it's a tough place every single day.

It's that experience that has taught us that all of our products need to be tough, 'every single day' tough.

That's why we came up with our Accelerated Life Testing

Our ALT™ and other programmes test our radios to simulate a full five years of hard use. Five years worth of being dropped, bashed, shaken, heated, frozen, shocked, and soaked; And that's not just five 'consumer' years, but five 'mission critical' years of hard use.

Durability is only one half of the story, we test for toughness too. Here are a couple of examples of standard tests that all, not just our rugged ones, terminals have to exceed;

- **Thermal Shock Test** - Frozen to -57°C for two hours, then heated to +80°C in less than fifteen seconds and kept there for a further two hours. This is then repeated a further five times in 24 hours.

- **Drop Test** - Dropped from a height of 1.2 meters on each of the six faces of the radio onto a smooth concrete or steel surface. This is repeated multiple times and only passes if the terminal continues to function throughout the test and this includes the battery not falling off and providing continuous power to the terminal.

User Research Quote

"Once I put on my uniform, I step out of the consumer world, and into a reality of life and death"

Police Officer, UK



ONE MILLION AND COUNTING...

Accessories that match the mission

Designed for Mission Critical

Apollo 11 is estimated to have travelled close to one million miles. On the lunar module was a Motorola radio transponder transmitting all the telemetry, tracking, voice communications and television signals between Earth and the moon. It's an extreme example of Mission Critical Communications, but we apply the same design philosophy to TETRA Terminals as we did to that transponder.

It's a philosophy that says, not only do our products have to be tough; they have to be simple to use too, intuitive. The reason for that is simple. In Public Safety, when you need to communicate, it's not a matter of convenience; it's important.

Rule One. Keep it working

It should be obvious, but how many times have you dropped your cellphone and the battery door and battery have pinged out? Scrabbling about in the street is one thing, but in a burning building it's very different. All of our TETRA Terminals are designed to flex on impact. This flexibility allows the energy to dissipate around the terminal, greatly reducing the risk of the battery falling off, or even worse, the radio being damaged.

Rule Two. Keep it simple

Our designers actually spend time with real users, understanding how they really work. This insight allows us to design our terminals to be easier to use in the real world. For example, the menu system is designed to look like a phone interface which makes it as easy to use as a device people use everyday.

Another great example is the MTP850Ex ATEX Radio. It's designed from scratch, taking from the MTP850 only where it makes sense, and the first big difference you notice (apart from the bright red colour) is the big "Glovable" buttons on the front, and when you look closer, you find crucial safety features like "man down".

Integrated Terminal Management

The key to effective terminal management is complete and fast control of the fleet, wherever they are with minimal impact to the end user. A server stores all terminals versions and programming details. Management PCs at convenient places create upgrade/configuration jobs for some or all of the fleet. Reporting tools show exactly the fleet status. iTM is a modular system aimed at fleets of 100 to 50,000 terminals.

Spotlight for 2009

MTP850 S

The MTP850 S TETRA is upgraded with the option for 1.8W Operation, integrated mandown, and rugged side connector.



CEP400

The need for a simpler and cost effective terminal is addressed with the CEP400. It offers users the essential features of TETRA service in a robust and easy to use package.



MTP850Ex ATEX 800 MHz

This TETRA terminal is optimised for use in dangerous and explosive gas and dust environments. It can be used whilst wearing thick industrial gloves and is now available in the 800 MHz band.



TCR1000 - New accessories

This is the world's smallest TETRA radio, and is available for users who need low visibility TETRA communications. A comprehensive and expanded set of accessories is available to optimise the unit for all types of covert operations.



AUDIO AND CARRY ACCESSORIES

From covert surveillance to high noise environments. Carrying accessories in various forms and materials.

A Motorola solution offers convenience and hands free mobility.

BATTERIES AND CHARGERS

Genuine Motorola batteries designed to deliver optimum performance from you. Whether on your desk or in your vehicle, Motorola charging solutions maximise.



INFRASTRUCTURE TAILORED FOR YOUR NEEDS

For those working in the field, an effective, reliable, intuitive, easy to use communication system is both vital and sometimes challenging. That's why business-critical users are looking for highest efficiency value, features and flexibilities offered by Motorola's Dimetra IP family.

The Dimetra IP architecture has been designed for mission critical environments, and is proven in deployments around the world for over 10 years. Optimised for operation critical customers, Dimetra IP Compact has been developed for industrial customers looking for reliability and efficiency as well as availability and security from their communication systems. The Dimetra IP Micro now extends the benefits and optimises the performance for industrial and commercial customers. These customers are looking for lower cost of ownership and a migration path from existing analogue systems to digital trunking solutions to further improve their efficiency and productivity, at the same time controlling and managing their resources over the defined area of operation. In addition, customers who already have an installed analogue base could benefit from combining a Motorola TETRA solution with their existing network, and phase out or redeploy analogue units over time. Such Commercial & Industrial markets include, Oil & Gas companies, manufacturing, mining, small seaports and airports, as well as large hotels, casinos and event management.

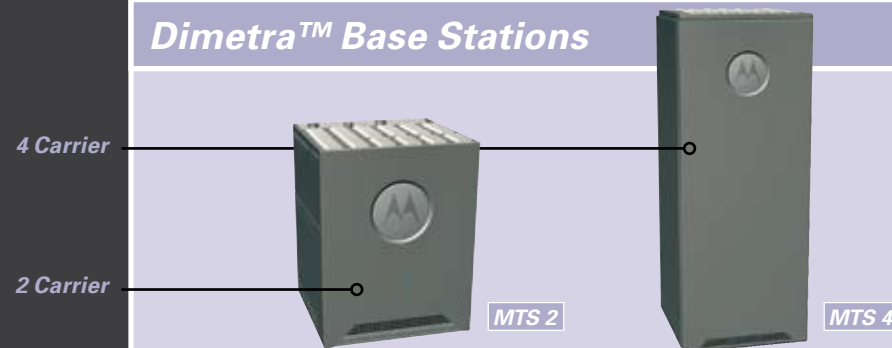


Dimetra™ Family

Dimetra™ Switches



Dimetra™ Base Stations



MCC7500 IP Dispatch solution for DIMETRA IP, DIMETRA IP COMPACT and DIMETRA IP MICRO

Motorola's MCC7500 IP Dispatch Console is specifically designed with a flexible intuitive interface to manage communicate and control your communications in the field.

MCC7500 is one of the most advanced yet simple to use and scalable dispatcher solutions in the market from basic affordable use to complex operation requirements and features. This is to support efficient use of the resources in the field and interfacing to existing analogue or conventional networks to ease the migration path to a Motorola TETRA trunking solution.



SYSTEMS DESIGNED FOR SPECIFIC MISSIONS



Motorola offers a complete portfolio of solutions for police users. Our solutions offer the highest levels of security and resilience and are customised to meet user needs. For example, our TCR1000 Covert radio forms the basis of a complete surveillance solution whilst the in-built man down capability on the new MTP850 S enhances safety. Maybe that is why we have won the last 6 nationwide public safety contracts that have been awarded.

Motorola offer a complete portfolio of solutions for Fire and Rescue workers, aligned to their operational needs. Solutions include two way alerting solutions for retained firefighters and specialist officers as well as solutions to help mobilise fire and rescue workers. Motorola also provides a range of solutions to ensure effective communications between the incident commander and command and control as well as specialised solutions for use at the fireground such as the MTP850 Ex, and our ATEX certified TETRA radio

The challenge facing all rail and metro operators is the ability to transport goods and/or passengers to the scheduled destinations - safely and on time. The right communications system can help this be cost effectively achieved. Motorola has worked closely with rail and metro operators to deliver complete TETRA solutions tailored to their needs. For example, with customised passenger information systems and controller applications.

Motorola's TETRA solution offers dedicated and resilient wireless communications specifically adapted to meet the needs of upstream, midstream and downstream operations. For example, we offer intrinsically safe radios for use in hazardous environments along with specific solutions for pipeline monitoring. These solutions help ensure that safety requirements are met and business efficiency is increased.

Airports are highly dynamic environments in which time, cost, and safety are key considerations for all the businesses operating within them. They are also areas where conventional mobile telephony is highly congested. Motorola's TETRA solutions offer secure, resilient communications and are specifically designed to enhance all aspects of airport operations. For example, we offer specific solutions for apron/ramp clearance and to ensure maximum resilience.

POLICE



FIRE



RAIL



OIL AND GAS



AIRPORT



A COMPLETE SERVICES PORTFOLIO FROM THE EXPERTS IN MISSION CRITICAL SERVICES

Intergration Services



Motorola offers a full portfolio of design planning and integration services from initial concept through system planning and design to implementation and integration. These services ensure that whatever your requirements, Motorola can design and deliver a high performance and cost effective solution.

Support Services



Motorola offers a comprehensive and flexible portfolio of support services to ensure peak performance, cost effective operations and high availability. Solutions range from maintenance and repair services to technical support and training services for new and existing systems. A service package can be customised to meet individual customer requirements including clearly defined service level agreements.

Terminal Support Services



A choice of predefined support packages designed to meet your needs and budget plus a complete portfolio of additional services to enable you to provision, manage and support your terminals.

Value Added Services



A range of value-added solutions to enhance efficiency, performance and security. Services offered include: Intelligent Optimisation Service; Special Event Monitoring; Security Assessment and Evaluation; Network Security Monitoring and Alarm management and Correlation.

Managed Services



Motorola offers a complete portfolio of Managed Services designed to help organisations to: improve performance; reduce total cost of ownership; maximise work force flexibility; access best in class resources and effectively manage long term risk and budgets. All services are offered to jointly defined Service Level Agreements (SLAs) and tracked against Key Performance Indicators (KPIs).





Case Study: *Intelligent Optimisation Service*

“MOTOROLA’S IOS SERVICE DELIVERED FOCUSED RECOMMENDATIONS FOR PERFORMANCE IMPROVEMENT. I WAS IMPRESSED BY BOTH THE SPEED WITH WHICH THE RESULTS WERE OBTAINED AND THE ACCURACY OF THE DATA.”

Robert Williamson, Technical Director,
Isle of Man, Dept of Home Affairs, Comms Division

Feature: *European Radio Support Centre (ERSC)*

Motorola’s ERSC expertly repairs your radios to manufacturing specifications using the latest tools and with strict adherence to Motorola engineering procedures. The ERSC supports more than 600 customers in 22 different countries with 15 different languages. **And it delivers.** In 2008, 75% of contracts were for same day repair and over 96% of repairs were completed on time. 100% of direct customers are either satisfied or very satisfied.

Feature: *Managed Services*

Motorola is delivering a full “Build, Own & Operate” managed services solution in Austria through TETRON. TETRON provides essential digital radio communications to public safety organisations in the country and is majority owned by Motorola. The solution is delivering clear benefits including: leveraging expertise not available internally; government resources left to focus on critical issues and a minimisation of total costs.

www.motorola.com/TETRA



MULTIPLY OPERATIONAL EFFECTIVENESS

With Applications that have proved themselves in real life



**Protect
People &
Resources**

The MotoLocator application suite allows enterprises to easily visualise and track the location of people and mobile assets to ensure their security.

**Enhance
Situational
Awareness**

Our video security solution enables users to collaborate in real time, share video and improve emergency response with better informed decision-making.

**Improve
Utilisation of
Personnel**

Leveraging best-of-the-breed technology partnerships our solutions include automated intelligence and analytics, allowing enterprises to achieve more with less.

**Expand
Evidentiary
Capabilities**

Our end-to-end mobile video surveillance solution allows public safety organisations to effectively manage voice, data and video contextual information.

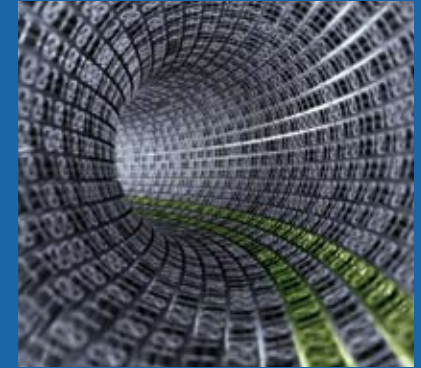


User Research

In an application of our video security solution, a 40% reduction in crime rate was observed

TEDS - EVOLVING TETRA TO MEET TOMORROW'S DATA REQUIREMENTS

TETRA Enhanced Data Service (TEDS) is part of TETRA standards Release 2, an evolution of TETRA release 1 to which it is backwards compatible. It will provide a step change in the data rates available over TETRA, thereby meeting the need for higher speed data services.



Introducing TEDS is straightforward with Motorola's complete solution

Base Station

Motorola's latest generation of base stations are TEDS ready. TEDS can be installed simply by loading the appropriate software and configuring each carrier as required, i.e. either for TEDS (TETRA2) or TETRA1.

Core

Motorola's integrated all IP core network is fully scalable to support increases in data going forward. Therefore TEDS along with voice and existing TETRA data services can all be supported on one integrated network. This will greatly reduce both OPEX and CAPEX, as all speech and data will be carried on the same links & managed on the same network management & security systems.

Devices

Motorola's leadership in data enabled TETRA devices is well established including MSPD (Multi-Slot Packet Data), WAP and GPS being supported across our entire range. Motorola is leveraging this leadership along with our experience in developing high speed data devices from other technologies to offer a range of TEDS devices that include the latest technology whilst still being easy to use. Motorola's first TEDS offering will be a Mobile Radio based on the MTM800E for in vehicle communications followed by Modems, PDA's and other new devices to meet market demand.

Applications

Motorola offers a range of applications today, such as MotoLocator which is a complete location solution. Motorola also enables the development of tailored applications to meet a variety of market requirements, through its ecosystem of application partners as well as customer specific application providers. Key enablers offered range from open application programming interfaces, through WAP and WWW enabled devices to provide full integration support.

WOULD YOU LIKE TO KNOW MORE?





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