MTM5000 SERIES TETRA MOBILE RADIOS SAFER SMARTER FASTER

ENABLING CURRENT AND FUTURE CRITICAL COMMUNICATIONS
DATA IS GROWING IN IMPORTANCE

When it was introduced the dominant use of TETRA was for voice communications, but the use of TETRA as a data bearer has steadily increased. Beginning with the use of status messaging and text, data over TETRA has evolved into the use of picture messaging, WAP, and data-base access. TETRA is also being used for machine to machine communication in industries such as power distribution.

TEDS will enrich the data experience for all types of users. For example data base access will be faster, and additional data can be accessed such as pictures. Uploads can also be enlarged to include fingerprints, pictures and small video clips.

TRENDS IN TETRA CORE NEEDS

TETRA Systems continue to be deployed in more and more countries supporting Public Safety and Mission Critical operations with secure, reliable, and resilient communications. Motorola has shipped over 2 million TETRA radios to customers around the world.

Users of TETRA require:
- Rapid and reliable call connections
- Rugged terminals to withstand all weather conditions and rough handling
- Secure communications to prevent unauthorised reception or interception
- Resilient systems to withstand sabotage or natural events, and separation from public systems which become overloaded
- User location for safety and efficiency
- Data services, with a migration path to broadband in the future
SOFTWARE FEATURES
TO CUSTOMISE THE MTM5000

The Motorola mobile radio family has been deployed by many public safety and industrial users. Special applications have been developed to meet the particular needs of these customers which are available for all users. These are just some examples.

Messaging Applications. Special messaging applications are available to increase the speed of communicating with teams. For example, Disaster Alert which is an emergency pre-emptive priority call made by a user alerting a single pre-defined group to the presence of a disaster such as an earthquake or major accident.

Resource Allocation. Call out is an application to determine quickly which mobile units are available to answer a call and to then allocate them to the task.

Optimising the network. GPS service inevitably uses some data capacity, LIP throttling limits the impact of GPS traffic when the network is congested. Secondary Control Channel (SCCH) will increase capacity for data traffic in a TETRA network by opening a second channel. This will help to speed-up the flow of GPS and SDS traffic. Network access can be adapted for special needs, either by preventing access for unauthorised users or providing preferential access for special users.

Security. End to End encryption can be enabled on either voice or data services. Stun or Kill will temporarily or permanently disable the radio if stolen from or in the vehicle.

SDS Remote Control. Enables control of one or more terminals from a workstation and a controlling TETRA Radio Over the Air using the PEI interface. For example a local fire controller using a field PC and a controlling MS can increase or decrease volume of an individual radio, or change talk groups. Or a Dispatcher or controller can directly request GPS position of an officer who is not responding to a call.

READY FOR THE FUTURE, THE EVOLUTION OF TETRA AND CRITICAL COMMUNICATIONS

TETRA has continued to evolve since it’s introduction in 1992 and users have been offered a continuous stream of improvements and enhancements which have increased the functionality, reliability, and value of the TETRA network. During this time the data speeds of TETRA have increased with the introduction of Multi-Slot Packet Data. Now with the introduction of TETRA Enhanced Data Service (TEDS) a further significant increase is enabled. This has come at a time when many users are experiencing the benefits of mobile data using public carriers and PDAs and Smartphones. TEDS will support the migration of many applications across to TETRA networks with the attendant benefits of security and resilience.
MTM5000 SERIES
TETRA MOBILE RADIOS

The Motorola MTM5400 Mobile TETRA radio has been joined by two new models to give a choice of specifications to match end user profiles and needs.

SAFER
• HEAR AND BE HEARD IN DIFFICULT ENVIRONMENTS WITH ENHANCED AUDIO
• STAY IN TOUCH WITH GREAT COVERAGE, IMPROVED RX SENSITIVITY AND HIGH POWER OPTIONS

SMARTER
• VERSATILE INSTALLATION CONNECTS END USERS IN AND AROUND THE VEHICLE, UP TO 40M FROM THE RADIO WITH THE MTM5500
• CONTROL THE RADIO AND MAKE VOICE AND DATA CALLS INSIDE OR OUTSIDE THE VEHICLE WITH THE TELEPHONE STYLE CONTROL HEAD

FASTER
• BE READY FOR TEDS FOR FASTER DATA COMMUNICATIONS TO IMPROVE EFFICIENCY AND SAFETY
• LINK TO DATA DEVICES FOR FLEXIBILITY AND POWERFUL APPLICATIONS
The MTM5200 is the base model sharing the enhanced audio and receiver sensitivity of the current MTM5400, as well as being TEDS-ready.

The MTM5400 includes high power modes and the Gateway Repeater functionality features required by end users in areas of limited coverage.

The MTM5500 is a highly flexible and capable system radio which permits the installation of multiple control heads and/or the new Telephone Style Control Head up to 40m from the radio.

MTM5000 SERIES BENEFITS

EXTENDED OPERATIONAL RANGE
- Up to 10W transmit power (MTM5400/5500), with class leading receiver sensitivity delivers comprehensive network coverage
- Integrated DMO Gateway, DMO Repeater capabilities (MTM5400/5500), ensure secure and resilient communications where needed most

SUPERIOR AUDIO PERFORMANCE
- Next generation audio architecture delivering the loudest and clearest audio performance of any Motorola TETRA mobile available on the market*

HIGH SPEED DATA CONNECTIVITY
- TEDS Ready hardware - with a simple software license upgrade, enables 20x faster data connectivity for accessing back-office systems and databases
- Integrated USB 2.0 PEI, enabling rapid radio programming and standardised interfacing to data terminals and accessories. For additional flexibility, USB host and slave modes are also supported

LOW USER MIGRATION COSTS
- Familiar cellular style user interface and VGA colour display for enhanced usability and reduced staff training costs
- Same user interface as market proven MTM800 Enhanced mobile radios
- Re-use of MTM800 Enhanced accessories using GCAI connector

ENHANCED END TO END ENCRYPTION OPTIONS
- Integrated hardware for SIM based end to end encryption
- Universal Crypto Module option**

ADVANCED TERMINAL MANAGEMENT
- USB 2.0 interface for fast radio programming via Motorola’s integrated Terminal Management solution

FLEXIBLE INSTALLATION OPTIONS
- Fully DIN-A compatible and available in Dash, Desk, Remote Head and Motorcycle mount formats
- Supports multiple control heads - an ideal solution for installations in trains, ambulances and fire vehicles where more than one control point might be required

RUGGED DESIGN WITH Exceptional RELIABILITY
- Includes IP67 control head option (MTM5200/5400), for exposed and challenging environments
- Front and Rear rugged GCAI connector for reliable connection of audio and data peripheral equipment
- Mobile radio and accessories are performance matched for enhanced reliability
- MTM5500 ethernet style connections enable up to 40m separation to either the new eCH Control Head or the Telephone Style Control Head

*Assuming the appropriate audio accessory is used  **Model specific
MTM5000 SERIES SOLUTIONS

The MTM5000 Series brings an ever wider range of installation options to the operator, with multiple control and expansion head options together with the option of multiple control head installation options up to 40m from the radio, with either the new eCH or the TSCH.

MTM5200 AND MTM5400

EXPANSION HEAD OPTIONS
- Expansion Head Single Std Connection
- Expansion Head Enhanced Std and Auxiliary 25 Pin and RS232

CONTROL HEAD OPTIONS
- Standard Control Head
- Remote Control Head
- IP67 Control Head

INSTALLATION OPTIONS
- Dash Mount - Car, Truck
- Remote Head Mount - Car, Ambulance, Fire Truck
- Desk Mount - Control Centre
- IP67 Mount - Boat, Motorcycle
- User Supplied Terminal
- Data Only Installation

PRODUCT SELECTION

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MTM5000 SERIES
ACCESSORIES

MTM5500

EXPANSION HEAD OPTIONS
FLEXIBLE EXPANSION HEAD (ETHERNET READY)
2X STD ETHERNET TYPE, ETHERNET SIM READER AND RS232

CONTROL HEAD OPTIONS
FLEXIBLE CONTROL HEAD (eCH)
SUPPORTS EXTERNAL SPEAKERS AND PTT
TSCH (TELEPHONE STYLE CONTROL HEAD)
SUPPORT EXTERNAL SPEAKERS AND PTT

INSTALLATION OPTIONS
MULTIPLE CONTROL HEADS - AMBULANCE, FIRE TRUCK, INCIDENT CONTROL VEHICLE, METRO TRAIN

USER SUPPLIED TERMINAL
ETHERNET TYPE
DATA ONLY INSTALLATION

AUDIO - VISOR MICROPHONE
AUDIO - MOBILE MICROPHONE
AUDIO - MOBILE MICROPHONE
AUDIO - MOBILE MICROPHONE
AUDIO - MOBILE MICROPHONE
AUDIO - LOUDSPEAKER
MOUNT - DASH OR FLOOR BRACKET
ANTENNAS
ANTENNAS
ANTENNAS
ANTENNAS
ANTENNAS
CONTROL STATION
CONTROL STATION POWER SUPPLY
ALARMS, SWITCHES & CABLES
MTM5000 SERIES INSTALLATION OPTIONS

**MOTORCYCLE***

1. Remote Mount Fixtures
2. Handlebar Controls (PTT Talk Group)
3. Headset Interface QD (Quick Disconnect)
4. Headset (Helmet)
5. Remote Control Head IP67
6. Loudspeaker (External or Internal)
7. Alternate Microphone (In rear box)
8. Standard Control Head
9. Antenna and/or GPS Combination

*For information on Covert Motorcycle Installations please contact your local Motorola representative

**POLICE CAR**

1. Dash or Remote Mount Fixtures
2. Loudspeaker
3. Visor Mic
4. PTT (Dash)
5. ALT Microphone (Fist or Handset)
6. Antenna: Wide Range, Roof Mount, Glass, Low Profile Combi
7. Antenna: Mag Mount

**AMBULANCE**

1. Dual Control Head Fixtures (Front)
2. Dual Control Head Fixtures (Back)
3. Visor Mic
4. PTT (Front)
5. PTT (Rear)
6. ALT Microphone (Handset) (Dash)
7. ALT Microphone (Handset) (Rear)
8. Loudspeaker (Dash)
9. Loudspeaker (Rear)
10. Antenna Low Profile
These illustrations show how the radio can be installed in four typical vehicles. In addition there are kits to fit the radio into a wide variety of cars, trucks, trams, control vehicles, control rooms, covert cars and motorcycles, and even boats.
**General**

- **Dimensions (HxWxD)**: MTM5200 - 60x188x198, MTM5400 - 60x188x198, MTM5500 - 60x188x198
- **Weight (typical)**: MTM5200 - 1300, MTM5400 - 1300, MTM5500 - 1300

**Transceiver only**

- **Dimensions (HxWxD)**: MTM5200 - 45x170x169, MTM5400 - 45x170x169, MTM5500 - 45x170x169
- **Weight**: MTM5200 - 320, MTM5400 - 320, MTM5500 - 320

**Remote control head**

- **Dimensions (HxWxD)**: MTM5200 - 60x188x39, MTM5400 - 60x188x39, MTM5500 - 60x188x39
- **Weight**: MTM5200 - 300, MTM5400 - 300, MTM5500 - 300

**Standard control head**

- **Dimensions (HxWxD)**: MTM5200 - 60x188x31, MTM5400 - 60x188x31, MTM5500 - 60x188x31
- **Weight**: MTM5200 - 320, MTM5400 - 320, MTM5500 - 320

**Motorcycle control head**

- **Dimensions (HxWxD)**: MTM5200 - 60x188x31, MTM5400 - 60x188x31, MTM5500 - 60x188x31
- **Weight**: MTM5200 - 320, MTM5400 - 320, MTM5500 - 320

**User Interface & Display**

- **Display**: 2.8” VQA - 640x480 pixels, Transflective TFT, 65,000 colours
- **Backlight**: Variable backlight, User configurable
- **Menu Configuration**: Standard & Zoom mode (80 pixels, 4mm high) characters
- **TSCH**: Available as option*
- **Buttons & Keypad**:
  - **International Keypad Versions**: Roman, Arabic, Cyrillic, Korean, Chinese, Taiwanese characters
  - **Programmable Function Keys**: 3 programmable function keys (plus 10 programmable numeric keys)
  - **Navigation**: 4-way navigation key, menu and soft keys
  - **Emergency**: Emergency button with backlight
  - **Shortcuts**: User configurable shortcuts to menus and common features using “One-Touch-Button” feature
- **Rotary**: Dual Function
- **Keypad Lock**: All Control Heads
- **Screen Saver**: Gif image & text (any user's selection)
- **Universal Time Display**: All Control Heads
- **Country/Network Code List**: 100
- **Intelligent Keypad Text Input**: All Control Heads
- **Contact List**: Up to 1000 contacts
- **Intelligent Key Pad Text Input**: All Control Heads
- **Menu Configuration**: Dual layer folder structure (folder/subfolder)
- **Main Menu**: 256 folders
- **Favourite Folders**: Up to 3 (to store any favourite talkgroup)

**RF Specifications**

- **Frequency Bands (MHz)**: MTM5200 - 350 - 390, 380 - 410, 410 - 470, 806 - 870, 380 - 430, 410 - 470, 806 - 870
- **Transmitter RF Power**: TETRA Release 1 - N.A. (1W only), TETRA Release 2 (TEDS) - 3W, Class 3
- **Receiver**: 6 Power Step Levels (steps of 5 dBm) Starting at 15 dBm, finishing at 48 dBm
- **Receiver Static Sensitivity (dBm)**: MTM5200 - 114 minimum, 116 typical (TETRA 300-392-2)
- **Receiver Dynamic Sensitivity (dBm)**: MTM5200 - 105 minimum, 107 typical (TETRA 300-392-2)

*Please refer to the separate specification sheet **For availability of other language keypads please contact your local MSI representative
**GPS SPECIFICATIONS**

- **Simultaneous Satellites**: 12
- **Mode of Operation**: Autonomous or assisted (A-GPS)
- **GPS Antenna**: Supports active antenna (2W DSSS supply)
- **Autonomous Acquisition Sensitivity**: < -143 dBm / -133 dBW
- **Tracking Sensitivity**: < -195 dBm / -185 dBW
- **Accuracy**
  - TTI (HOT Start - Autonomous): < 5s
  - TTI (WARM Start - Autonomous): < 11s
  - TTI (COLD Start - Autonomous): < 36s
- **Location Protocols**
  - ETSI Location Information/Protocol (LIP)
  - Motorola LIP

**VOICE SERVICES**

- **Talkgroups**: 2948 (TMO) & 1024 (DMO)
- **Scan lists**: 40 lists of 20 talkgroups
- **Phone book entries**: 1000 persons, up to 6 numbers per entry (mobile, office etc.), Max 2000 entries
- **Emergency (tailored by users)**
- **TEDS (capable)**
- **Packet Data (PD)**
- **Terminal Management (including WAP-PUSH)**
  - Cellular style iTAP predictive text entry
  - QAM Channels: 25 kHz and 50 kHz (but not D8PSK channels)

**DATA SERVICES**

- **Status**
  - Alias messages: 400 Entries
- **Options**
  - Can be sent via GMDN or via menu
- **Short Data Service (SDS)**
  - 200 Entries (short message), 40 Entries (long messages of up to 1000 characters)
  - Cellular style iTAP predictive text entry
- **Target Address**
  - Sent to individual or group address (selected or dedicated)
- **Voice Call Interaction**
  - SDS messages can be sent and received during a voice call
- **Packet Data (PD)**
  - Data transmission with up to 4 slots supporting up to 28.8 kbit/s (gross)
  - Enhanced Data Service (EDS) (via software upgrade) Supporting 25kHz and 50kHz channel bandwidths and enabling practical data rates of up to 80kbit/s
- **TETRA Enhanced Data Service (TEDS)** (via software upgrade)
- **TEDS (capable)**
  - GAN Channels: 25 kHz and 50 kHz (but not D8PSK channels)
  - GAN modulation/coding modes: 4-GAN R1/2, 16-GAN R1/2, 84-GAN R1/2, and 64-GAN R2/3
- **WAP**
  - Integrated WAP browser (including WAP-PUSH)
  - WAP 1.2.x and WAP 2.0 compatibility for UDP/IP Stack
  - EN 303 035-1 support

**SECURITY FEATURES**

- **Authentication**
  - TEA1, TEA2, TEA3
- **Provisioning**
  - Secure provisioning tool via Key Variable Loader (KVL)
- **User Access Control**
  - Service Profile Selection for Radio User
  - Authentication
  - Infrastructure initiated and made mutual by terminal

**REGULATORY COMPLIANCE**

- **Radio (P&T/ET Article 3.2)**
  - EN 303 095-1
  - EN 303 095-2
  - ETS EN 300 394-1
  - EN 301 489-1
  - EN 301 489-18 V1.1.1
  - EN 300 394-2
  - EN 300 394-5
  - EN 300 394-3
  - EN 300 394-6
  - EN 300 394-7
  - EN 300 394-17

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For more information on the MTM5000 Series radios, please visit us on the web at:
www.motorolasolutions.com/MTM5000