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
TETRA ON THE MOVE
WHAT’S NEEDED IN A MOBILE TETRA RADIO

- Rugged and simple to use with an intuitive interface
- Excellent coverage in both urban and rural environments
- Range of installation kits and accessories for use on a variety of vehicles
- Flexible connections to interface with companion devices such as cameras, mobile computers, PDAs
- Options for enhanced security
- Advanced applications for specialised operations

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 its 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 MTM6400 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 MTM5000 SERIES BROCHURE PAGE 5

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.

Combining class leading robustness with a sleek ergonomic design, the discreet Telephone - Style Control Head (TSCH) provides flexibility and ease of operation, making it well suited for in-vehicle applications. Fully compatible with MTM5500 radios, the design attributes of the TSCH ensure uncompromising performance for mission-critical operations.

### 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

#### 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
- Retains 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

SINGLE CONTROL HEAD INSTALLATION

MULTIPLE CONTROL HEAD INSTALLATION

FOR AREAS WHERE COVERAGE IS RESTRICTED

- **Model specific**
- Required by end users in areas of limited coverage.

- **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.

**MTM5000 SERIES BROCHURE PAGE 5**
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.

PRODUCT SELECTOR

<table>
<thead>
<tr>
<th>MTM5200</th>
<th>MTM5400</th>
<th>MTM5500</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CONTROL HEAD</td>
<td>2 CONTROL HEADS</td>
<td></td>
</tr>
<tr>
<td>STANDARD POWER</td>
<td>HIGH POWER FOR LOW COVERAGE AREAS</td>
<td></td>
</tr>
<tr>
<td>NOT INCLUDED</td>
<td>GATEWAY REPEATER INCLUDED</td>
<td></td>
</tr>
<tr>
<td>TEDS AND ESSENTIAL FEATURES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESSENTIAL</td>
<td>HIGH CAPABILITY</td>
<td>PREMIUM</td>
</tr>
</tbody>
</table>

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
- DATA ONLY INSTALLATION
- USER SUPPLIED TERMINAL
- UP TO 10m

MTM5200 | MTM5400 | MTM5500
---------|---------|---------
PREMIUM | ESSENTIAL | HIGH CAPABILITY
TEDS AND ESSENTIAL FEATURES | | |
**MTM5000**

**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
- DATA ONLY INSTALLATION

**USER SUPPLIED TERMINAL**
- ETHERNET TYPE

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**ACCESSORIES**
- 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.
**MODELS - COMPLIANT WITH DIN 75490 (ISO 7736)**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>MTM5200</th>
<th>MTM5400</th>
<th>MTM5500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dash</td>
<td>Compact radio for fast vehicle installation</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>Desk</td>
<td>Compact radio, for use in the office. Optional range of accessories such as desk tray with integrated multiplexer</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>Multiple Remote Control Head</td>
<td>N.A.</td>
<td>Radio with multiple remote mount control head capability</td>
<td>N.A.</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>Environmentally enhanced radio meeting IP67 specification</td>
<td>Suitable for demanding environments such as motorcycle, fire appliance and marine installations</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

**Expansion head “Databox”**

Radio without a control head, for data applications, or customised application development

**GENERAL**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>HxWxD (mm)</td>
<td>Weight Typical (g)</td>
</tr>
<tr>
<td>Dash and Desk models (transceiver + control head)</td>
<td>60x188x198</td>
</tr>
<tr>
<td>Transceiver only</td>
<td>45x170x169</td>
</tr>
<tr>
<td>Standard control head</td>
<td>60x188x31</td>
</tr>
<tr>
<td>Remote control head</td>
<td>60x188x29</td>
</tr>
<tr>
<td>Motorcycle control head</td>
<td>60x188x39</td>
</tr>
</tbody>
</table>

**USER INTERFACE & DISPLAY**

- **Display**
  - Type: VQA - 640x480 pixels Transflective TFT, 65,000 colours
  - Backlight: Variable backlight, User configurable
  - Front sizes: Standard & Zoom mode (80 pixels, 4x5mm high) characters
  - TSCH: Available as option*
  - Numberic: Integral backlit numeric keypad of 12 keys, with keypad lock option
  - 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 Talkgroup and volume change with lock option
  - Indication: LED - Tri-colour LED
  - Times: Configurable notification times
  - User Interface Languages: Arabic, Chinese Simplified, Chinese Traditional, Croatian, Danish, Dutch, English, French, German, Greek, Hebrew, Hungarian, Italian, Korean, Lithuanian, Macedonian, Mongolian, Norwegian, Portuguese, Russian, Spanish, Swedish, User defined: User programmable, using ISO 8859-1 character
  - Menu: Tailored to user needs
  - User Interface & Display: LCD - 2.8”

**ELECTRICAL SPECIFICATIONS**

- Voltage Range: 10.8 to 15.6 V DC
- Power Consumption: 1.8 - 2.3 W
- Current Consumption: 0.5 / 1.0 / 2.1 A / 3.44 A
- USB Specification: USB 2.0

**RF SPECIFICATIONS**

- Frequency Bands (MHz): 350 - 380, 430, 470, 806 - 870, 880 - 960
- Transmitter Power: TEDRA Release 1, TEDRA Release 2
- Receiver Power: 3W, Class 3
- Receiver Sensitivity: -114 dBm, -116 dBm
- Receiver Dynamic Sensitivity: -103 dBm, -107 dBm
**GPS SPECIFICATIONS**

- **Simultaneous Satellites**: 12
- **Mode of Operation**: Autonomous or assisted (A-GPS)
- **GPS Antenna**: Supports active antennas (SV-20x or supply)
- **Autonomous Acquisition Sensitivity**: -141 dBm / -133 dBm
- **Tracking Sensitivity**: -195 dBm / -185 dBm
- **Accuracy**: <6m (95% probable) <10m (95% probable)
- **TTFF (WARM Start - Autonomous)**: 1s
- **TTFF (COLD Start - Autonomous)**: <36s
- **Location Protocols**: ETSI Location Information/Protocol (LIP), Motorola (LIP)

**VOICE SERVICES**

- **Talkgroups**: 2048 (TMO) & 1024 (DMO)
- **Scan lists**: 40 lists of 20 talkgroups
- **Voice Call Interaction**: Group call, Private call
- **Emergency Call**: Emergency (tailored by users)
- **Terminology**: Interface (PEI), Peripheral Equipment

**DATA SERVICES**

- **Storage**: 400 Entries
- **Scan lists**: 40 lists of 20 talkgroups
- **Voice Call Interaction**: Group call, Private call
- **Tactical Call**: Emergency Group Call to ATTACHED talkgroup
- **Smart emergency**: TMX/TMX/DMX to TMX automatic switching options
- **Data transmission**: GMSK and QPSK with up to 4800 bits/s
- **TETRA Enhanced Data Service (TDS)**: TETRA Enhanced Data Service (TDS) via software upgrade
- **GMSK Modulation**: 25 kHz and 50 kHz (but not D8PSK channel)
- **QAM Channels**: 25 kHz and 50 kHz (but not D8PSK channel)
- **USB Support**: USB 2.0 support (Host Mode) to manage USB Slave Devices (e.g. SIM CARD READER)
- **USB On-The-Go**: USB On-The-Go (host & slave) capability for intelligent PEI applications

**SCANNING ATTACHMENT**

- **Supports SWMI initiated attachment/detachment
- **Configurable Repeater Power Levels**

**DATA SERVICES**

- **Status**: Alias messages
- **Data transmission**: TETRA Enhanced Data Service (TDS) via software upgrade
- **Modulation/Coding**: 4-QAM R1/2, 16-QAM R1/2, 64-QAM R1/2, and 64-QAM R2/3
- **QAM Channels**: 25 kHz and 50 kHz (but not D8PSK channel)
- **USB Support**: USB 2.0 support (Host Mode) to manage USB Slave Devices (e.g. SIM CARD READER)
- **USB On-The-Go**: USB On-The-Go (host & slave) capability for intelligent PEI applications

**USER ACCESS CONTROL**

- **Authentication Infrastructure**: initiated and made mutual by terminal
- **Security Classes**: Class 1 (Clear), Class 2 (SCK), Class 3
- **Algorithms**: TEA1, TEA2, TEA3
- **PIN/PUK Code Access**: TEA1 (compliant)
- **RS232**: For PEI (Four Virtual Ports via AT Multiplexer enable PC applications to run simultaneously Packet Data, AT Commands, SDS, SCOUT)
- **USB**: USB 2.0 support for PEI (Two Virtual Ports via standard Windows drivers enable PC applications to run simultaneously Packet Data and AT Commands)

**INTERFACES**

- **USB**: USB 2.0 support for PEI (Two Virtual Ports via standard Windows drivers enable PC applications to run simultaneously Packet Data and AT Commands)
- **USB On-The-Go**: USB On-The-Go (host & slave) capability for intelligent PEI applications
- **USB 2.0 Support**: USB 2.0 support for PEI (Two Virtual Ports via standard Windows drivers enable PC applications to run simultaneously Packet Data, AT Commands, SDS, SCOUT, rapid programming
- **USB 1.1 Support**: USB 1.1 support (Host Mode) to manage USB Slave Devices (e.g. SIM CARD READER)

**REGULATORY COMPLIANCE**

- **EN 50155:2007 (IEC 60571 ED. 3.0)**
- **EN 30360:2001 EME**
- **ETSI EN 301-392-2**
- **ETSI EN 300-908-1**
- **EN 301 481-1 V1.3.1**
- **EN 301 481-1 V1.3.1**
- **EN 301 481-1 V1.3.1**
- **EN 60950-1 (2001)**
- **EN50121-3-2:2008 (IEC 62236-3-2 Ed.2.0)**

**FUTURE SOFTWARE RELEASE**

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