The first of a new generation of TETRA radios, the MTM5400 underlines Motorola’s commitment to meeting the current and future needs of critical communications. This new radio supports a number of advanced capabilities including TEDS high speed data connectivity, integrated Direct Mode Gateway-Repeater, over the air programming and Background Programming, that combine to enhance operational efficiency and to enable users to make more informed decisions in the field.
Specifications

Models - Complaint with DIN 75490 (ISO 7736)

Dash
Compact radio for fast vehicle installation

Desk
Compact radio, for use in the office. Optional range of accessories such as desk tray with integrated loudspeaker

Multiple Remote Control Head
Radio with multiple remote mount control head capability. Range of installation options enable use in cars, vans and other vehicles

Motorcycle
Environmentally enhanced radio meeting IP67 specification. Suitable for demanding environments such as motorcycle, fire appliance and marine installations

Expansion head “Database”
Radio without a control head, for data applications, or customised application development

**General**

<table>
<thead>
<tr>
<th>Dimensions HxWxD (mm)</th>
<th>Weight Typical (g)</th>
</tr>
</thead>
<tbody>
<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>60x188x39</td>
</tr>
<tr>
<td>Motorcycle control head</td>
<td>60x188x39</td>
</tr>
</tbody>
</table>

**User Interface & Display**

<table>
<thead>
<tr>
<th>Display</th>
<th>2.8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>VGA - 640x480 pixels Transflective TFT, 65,000 colours</td>
</tr>
<tr>
<td>Backlight</td>
<td>Variable backlight, User configurable</td>
</tr>
<tr>
<td>Font sizes</td>
<td>Standard &amp; Zoom mode 100 pixels, 4.5mm high characters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buttons &amp; Keypad</th>
<th>Numeric</th>
<th>Integral backlit numeric keypad of 12 keys, with keypad lock option</th>
</tr>
</thead>
<tbody>
<tr>
<td>International keypad versions</td>
<td>Roman, Arabic, Cyrillic, Korean, Chinese, Taiwanese characters</td>
<td></td>
</tr>
<tr>
<td>Programmable function keys</td>
<td>3 programmable function keys (plus 10 programmable numeric keys)</td>
<td></td>
</tr>
<tr>
<td>Navigation</td>
<td>4-way navigation key, menu and soft keys</td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>Emergency button with backlight</td>
<td></td>
</tr>
<tr>
<td>Shortcuts</td>
<td>User configurable shortcuts to menus and common features using “One-Touch-Button” feature</td>
<td></td>
</tr>
</tbody>
</table>

**Indication**

<table>
<thead>
<tr>
<th>Display</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Tri-colour LED</td>
</tr>
<tr>
<td>Tones</td>
<td>Configurable notification tones</td>
</tr>
</tbody>
</table>

**User Interface Languages**

| Standard Options | 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**

<table>
<thead>
<tr>
<th>Tailored to user needs</th>
<th>Menu Shortcuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu Configuration</td>
<td></td>
</tr>
</tbody>
</table>

**Contacts Management**

<table>
<thead>
<tr>
<th>Cellular Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact List Up to 1000 contacts Up to 6 numbers per contact, Max 2000 numbers</td>
</tr>
<tr>
<td>Multiple Dialling Methods User selects how to dial</td>
</tr>
<tr>
<td>Fast Flexible Call Response Private Call Response to a Group Call via One Touch Button</td>
</tr>
<tr>
<td>Multiple Ring Tones</td>
</tr>
</tbody>
</table>

**Message Manager**

<table>
<thead>
<tr>
<th>Celluar Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text message list 20</td>
</tr>
<tr>
<td>Intelligent Keypad Text Input</td>
</tr>
<tr>
<td>Status list 100</td>
</tr>
<tr>
<td>Country/Network Code List 100</td>
</tr>
<tr>
<td>Scan lists 40 lists of 20 groups</td>
</tr>
<tr>
<td>Discrete Mode</td>
</tr>
<tr>
<td>Screen Saver GIF image &amp; text (any user’s selection)</td>
</tr>
<tr>
<td>Universal Time Display</td>
</tr>
<tr>
<td>Keypad Lock</td>
</tr>
<tr>
<td>Talkgroup Folders Dual layer folder structure (folder/subfolder) 256 folders</td>
</tr>
</tbody>
</table>

**Favourite Folders**

| User programmable, up to 2 (to store any favourite talkgroup) |

**Environmental Specifications**

| Operating Temperature (°C) | -30 to +40 |
| Storage Temperature (°C) | -40 to +85 |
| Not in use - Storage | ETSI 300 018-1-1 CLASS 1.3 Non-Weather Protected Storage Locations |
| Not in use - Transportation | ETSI 300 018-1-2 CLASS 2.3 Public Transportation |
| Stationary use - Weather Protected Locations | ETSI 300 018-1-3 CLASS 3.2 Partly Temperature Controlled Locations |
| Mobile use - Ground Vehicle Installation | ETSI 300 018-1-5 CLASS 5.2 Climatic Tests |
| Mobile use - Ground Vehicle Installation | ETSI 300 018-1-5 CLASS 5M3 Mechanical Tests |
| MIL STD | 810 C/D/E/F Specifications All 11 categories met (or exceeded) |
| Dust and Water Ingress Protection | IP54 (dust cat: 2) Dash/Desk/Remote models |
| Motorcycle | Motorcycle model (only control head is IP67; transceiver is IP54) |
**Electrical Specifications**

- **Voltage Range**: 10.8 to 15.6 V DC
- **Idle / Rx / Tx @ 10W**: 0.5 / 1.0 / 1.2 (TX 3.4A Peak)
- **Idle / Rx / Tx @ 3W**: 0.5 / 1.0 / 0.9 (TX 2.2A Peak)
- **Tx - Multi Slot PD @ 5.6W**: 2.2
- **Tx - TEDS @ 3W**: 2.3
- **Using USB host**: Adds 0.5A

**RF Specifications**

- **Frequency Bands (MHz)**: 380 - 430
- **Transmit / Receive Separation (MHz)**: 10
- **TMO Switching Bandwidth (MHz)**: 50
- **DMO Switching Bandwidth (MHz)**: 50
- **RF Channel Bandwidth (kHz)**: 25
- **Transmitter RF Power**: TETRA Release 1
  - TETRA Release 2 (TEDS)
- **RF Power Control**: 6 Power Step Levels (steps of 5 dBm)
  - Starting at 15 dBm; finishing at 40 dBm
- **RF Power Level Accuracy**: +/- 2dB
- **Receiver Class**: A & B
- **Receiver Static Sensitivity (dBm)**: -114 minimum, -116 typical
- **Receiver Dynamic Sensitivity (dBm)**: -105 minimum, -107 typical

**GPS Specifications**

- **Simultaneous Satellites**: 12
- **Mode of Operation**: Autonomous or assisted (A-GPS)
- **GPS Antenna**: Supports active antenna (5V, 25mA supply)
- **Autonomous Acquisition Sensitivity**: -143 dBm / -173 dBW
- **Tracking Sensitivity**: -159 dBm / -189 dBW
- **Accuracy**: <3m (90% probable) / <3m (99% probable)
- **TFF (Hot Start - Autonomous)**: <1s
- **TFF (Warm Start - Autonomous)**: <36s
- **TFF (Cold Start - Autonomous)**: <36s
- **Location Protocols**: ETSI Location Information Protocol (LIP)
  - Motorola LRRP

**Voice Services**

- **Talkgroups**: 2048 (TMO) & 1024 (DMO)
- **Phone book entries**: 1000 persons. Up to 6 numbers per entry (mobile, office etc.). Max 2000 entries
- **Scan lists**: 40 lists of 20 talkgroups

**Trunked Mode (TMO) Services**

- **Group call**: Late Entry, TMO/DMO Mapping
- **Private call**: Half / Full Duplex
- **Telephony (IPABX, PSTN, MS-ISDN)**: Full Duplex
- **DGNA**: Up to 2047 groups
- **Scanning**: Attachment signaling, supports SWMI initiated attachment/detachment

**Direct Mode (DMO) Services**

- **Group call**: Emergency Group Call to ATTACHED talkgroup
- **Private call**: Emergency Group Call to DEPLICATED talkgroup
- **Emergency (tailored by users)**: Non-Tactical
  - Emergency Call to PREDEFINED party (half/full duplex)
- **Smart emergency**: TMO/DMO/DMO to TMO automatic switching options
- **Hot Mic**: Configurable timers for automatic open mic (talk without PTT)
- **Location**: Location (GPS) sent with emergency
  - Target Address: Sent to individual or group address (selected or dedicated)
- **Alarm (status message)**: Emergency Status (or other pre-defined status)

**Data Services**

- **Status**: Alias messages
  - Options: Can be sent via One-Touch or via menu
  - 400 Entries
- **Short Data Service (SDS)**: Cellular style TAP 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)**: TETRA Enhanced Data Service (TEDS) (via software upgrade)
  - Supporting 25kHz and 50kHz channel bandwidths and enabling practical data rates of up to 80kbit/s
- **TEDS (capable)**: QAM Channels: 25 kHz and 50 kHz (but not D8PSK channels)
  - QAM modulation/coding modes: 4-QAM R1/2, 16-QAM R1/2, 64-QAM R1/2, and 64-QAM R2/3
- **WAP**: Integrated WAP browser (including WAP PUSH)
  - WAP 1.2.x and WAP 2.0 compatibility for UDP/IP Stack
- **Peripheral Equipment Interface (PEI)**: Interface Protocol
  - AT Commands - Full Set ETSI Mandatory Compliant
- **Terminal Management**: Programmable via Motorola Integrated Terminal Management (ITM) solution
  - Over-The-Air Programming (OTAP) Mode*: Capable
    - Background Mode Programming (BMP) capable* - while radio is operational (providing TETRA services) it is being programmed/configured.
  - *Planned features with software upgrade
### Gateway Services

**DMO/TMO Gateway**
- Group voice calls from DMO to TMO
- Group voice calls from TMO to DMO
- Emergency group call from DMO to TMO
- Emergency group call from TMO to DMO
- Transmission of Gateway Presence Signal
- Automatic detection and management of co-located Gateways
- Call Pre-emption (in either direction)
- SDS messaging from DMO to TMO (including GPS) or from TMO to DMO
- Configurable routing of SDS to console or PEI
- Management of point to point calls and SDS messages whilst operating as a Gateway

**Repeater Services**
- Repeats DMO voice and tone signaling on selected talkgroup
- Repeats SDS and Status messaging on selected talkgroup
- ETSI type 1A DMO Repeater for channel efficient operation
- Transmission of Repeater Presence Signal
- Priority Call
- Emergency Call (Pre-emptive Priority Call)
- E2EE Encrypted DMO traffic
- Monitoring of and participation in calls whilst in Repeater mode
- Configurable Repeater Power Levels

### Interfaces

**RS232**
- For PEI (Four Virtual Ports via AT Multipler 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)
- USB 2.0 support for PEI (Four Virtual Ports via AT Multipler enable PC applications to run simultaneously Packet Data, AT Commands, SDS, SCOUT), rapid programming
- USB On-The-Go (host & slave) capability for intelligent PEI applications
- USB 1.1 support (Host Mode) to manage USB Slave Devices (e.g. SIM CARD READER)

**Rugged Accessory Connector (I/CA)**
- GCAI – Motorola accessory and ancillary interface for connection of accessories, data terminals and programming

**General Purpose Input/Output**
- Digital I/O: 7 (4 on remote and motorcycle control head, 3 on transceiver)
- Analog input: 4 (1 on remote and motorcycle control head, with 4 levels)

### Security Features

- **Air Interface Encryption**
  - TEA1, TEA2, TEA3
- **Security Classes**
  - Class 1 (Clear), Class 2 (SCCK), Class 3 (GCK) (Encryption support on DMO/TMO Gateway and DMO Repeater requires specific software release)
- **Authentication**
  - Infrastructure initiated and made mutual by terminal
- ** Provisioning**
  - Secure provisioning tool via Key Variable Loader (KVL)
- **User Access Control**
  - PIN/PUK code access
- **Service Profile Selection for Radio User Assignment / Radio User Identity (RUA/RUI) Operation**
  - Based on login credentials, a radio user can be limited to only those radio capabilities defined in pre-installed service profiles, selected by the infrastructure
- **Data**
  - Packet Data user authentication
- **End to End Encryption (E2EE)**
  - Voice E2EE
  - Packet Data E2EE
  - Short Data (SDS) E2EE

### Regulatory Compliance

- **Radio (R&TTE Article 3.2)**
  - EN 301 035-1
  - EN 301 035-2
  - ETSI EN 300-394-1
  - ETSI EN 300-392-2
- **EMC (R&TTE Article 3.1.b)**
  - EN 301 489-1 V1.3.1
  - EN 301 489-18 V1.3.1
- **Electrical Safety (R&TTE Article 3.1.a)**
  - EN 60335-1 (2001)
  - EN 60335-2001 EME
- **Environmental**
  - Directive 2002/96/EC WEEE
  - Directive 2002/95/EC RoHS
- **Automotive**
  - E-mark, Automotive EMC Directive 95/44/EC

For more information please contact your local Motorola Authorized Dealer or Distributor.