ENABLING CURRENT AND FUTURE CRITICAL COMMUNICATIONS

MTM5000 SERIES
TETRA MOBILE RADIOS

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 in the new series of TETRA radios. It shares the enhanced audio and receiver sensitivity of the current MTM5400, as well as being TEDS-ready for high speed data service which will enhance operation.

The **MTM5400** includes high power modes and the Gateway Repeater functionality features required by a number of end users.

The **MTM5500** is a highly flexible and capable system radio which permits the installation of multiple control heads. Up to 40m from the radio for a total of 80m on a train or boat. The new Telephone Style Control Head provides an alternative method to control the radio and make voice and data calls.

Malux solutions

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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 MTP850 portable and 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

MTM5200

MTM5400

MTM5500

* Assuming the appropriate audio accessory is used

MTM5200 AND MTM5400

EXPANSION HEAD OPTIONS

EXPANSION HEAD
(SINGLE STD CONNECTION)

EXPANSION HEAD ENHANCED
STD AND AUXILARY 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

UP TO 10m

DESK MOUNT -
CONTROL CENTRE

IP67 MOUNT -
BOAT, MOTORCYCLE

UP TO 10m

USER SUPPLIED TERMINAL

DATA ONLY INSTALLATION

MTM5500

EXPANSION HEAD OPTIONS

FLEXIBLE EXPANSION HEAD
(ETHERNET READY)

2X STD, ETHERNET TYPE, ETHERNET SIM READER AND RS232

CONTROL HEAD OPTIONS

FLEXIBLE EXPANSION HEAD (eCH)
SUPPORTS EXTERNAL SPEAKERS AND PTT

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

SPECIFICATIONS

MODELS - COMPLAINT WITH DIN 75490 (ISO 7736)

	MTM5200	MTM5400	MTM5500
Dash	Compact radio for fast vehicle installation		N.A.
Desk	Compact radio, for use in the office. Optional range of accessories such as desk tray with integrated loudspeaker		N.A.
Multiple Remote Control Head	N.A.		Radio with multiple remote mount control head capability.
	N.A.		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		N.A.
Expansion head "Databox"	Radio without a control head, for data applications, or customised application development		

GENERAL

	Dimensions HxWxD (mm)	Weight Typical (g)	Dimensions HxWxD (mm)	Weight Typical (g)	Dimensions HxWxD (mm)	Weight Typical (g)
Dash and Desk models (transceiver + control head)	60x188x198	1300	60x188x198	1300	N.A.	
Transceiver only	45x170x169	1070	45x170x169	1070	45x170x169	1070
Standard control head	60x188x31	230	60x188x31	230	N.A.	
Remote control head	60x188x39	300	60x188x39	300	60x188x39	300
Motorcycle control head	60x188x39	320	60x188x39	320	N.A.	

USER INTERFACE & DISPLAY

Display	Diagonal dimension	2.8"	
	Type	VGA - 640x480 pixels Transflective TFT, 65,000 colours	
	Backlight	Variable backlight, User configurable	
	Font sizes	Standard & Zoom mode (90 pixels, 4.5mm high) characters	
TSCH		N.A.	Available as option*
Buttons & Keypad	Numeric	Integral backlit numeric keypad of 12 keys, with keypad lock option	
	International keypad versions	Roman, Arabic, Cyrillic, Korean, Chinese, Taiwanese characters	Roman**
	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	
	Tones	Configurable notification tones	
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		Tailored to user needs	
		Menu Shortcuts	
		Menu Configuration	
Contacts Management		Cellular Type	
Contact List		Up to 1000 contacts	
		Up to 6 numbers per contact, Max 2000 numbers	
Multiple Dialling Methods		User selects how to dial	
Fast/Flexible Call Response		Private Call Response to a Group Call via One Touch Button	
Multiple Ring Tones		Configurable with CPS	
Message Manager		Cellular Type	
Text message list		20	
Intelligent Keypad Text Input		All Control Heads	
Status list		100	
Country/Network Code List		100	
Scan lists		40 lists of 20 groups	
Discrete Mode		All Control Heads	
Screen Saver		gif image & text (any user's selection)	
Universal Time Display		All Control Heads	
Keypad Lock		All Control Heads	
Talkgroup Folders		Dual layer folder structure (folder/subfolder)	
		256 folders	
Favourite Folders		Up to 3 (to store any favourite talkgroup)	

* For availability please contact your local MSI representative
** For availability of other language keypads please contact your local MSI representative

ENVIRONMENTAL SPECIFICATIONS

		MTM5200	MTM5400	MTM5500
Operating Temperature (°C)		-30 to +60		
Storage Temperature (°C)		-40 to +85		
Not in use - Storage	ETSI 300 019-1-1 CLASS 1.3	Non-Weather Protected Storage Locations		
Not in use - Transportation	ETSI 300 019-1-2 CLASS 2.3	Public Transportation		
Stationary use - Weather Protected Locations	ETSI 300 019-1-3 CLASS 3.2	Partly Temperature Controlled Locations		
Mobile use - Ground Vehicle Installation	ETSI 300 019-1-5 CLASS 5.2	Climatic Tests		
Mobile use - Ground Vehicle Installation	ETSI 300 019-1-5 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		
	IP67	Motorcycle model (only control head is IP67; transceiver is IP54)		N.A.

ELECTRICAL SPECIFICATIONS

Voltage Range		10.8 to 15.6 V DC	
Current Consumption (A, typ.)	Idle / Rx / Tx @ 10W	N.A.	0.5 / 1.0 / 1.2 (TX 3.4A Peak)
	Idle / Rx / Tx @ 3W	0.5 / 1.0 / .9 (TX 2.2A Peak)	
	Tx - Multi Slot PD (4 slots) @ 5.6W	N.A. (3W only)	2.7
	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)		20	
RF Channel Bandwidth (kHz)		20	
Transmitter RF Power	TETRA Release 1	N.A. (3W only)	10W, Class 2 Note: MSPD limited to 5.6W, Class 2L
	TETRA Release 2 (TEDS)	3W, Class 3	
RF Power Control	6 Power Step Levels (steps of 5 dBm)	Starting at 15 dBm; finishing at 40 dBm	
Receiver Class		A & B	
Receiver Static Sensitivity (dBm)		-114 minimum, -116 typical (ETSI 300-392-2)	
Receiver Dynamic Sensitivity (dBm)		-105 minimum, -107 typical (ETSI 300-392-2)	

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	<5m (50% probable) <10m (95% probable)
TTFF (HOT Start - Autonomous)	<1s
TTFF (WARM Start - Autonomous)	<36s
TTFF (COLD Start - Autonomous)	<36s
Location Protocols	ETSI Location Information Protocol (LIP) Motorola LRRP

VOICE SERVICES

		MTM5200	MTM5400	MTM5500
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 (PABX, PSTN, MS-ISDN)	Full Duplex		
	DGNA	Up to 2047 groups		
	Scanning	Attachment signalling, supports SWMI initiated attachment/detachment		
Direct Mode (DMO) Services		Group call		
		Private call		
Emergency (tailored by users)	Tactical	Emergency Group Call to ATTACHED talkgroup		
	Non-Tactical	Emergency Group Call to DEDICATED talkgroup		
	Individual	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	400 Entries
	Options	Can be sent via One-Touch or via menu
Short Data Service (SDS)	Inbox	200 Entries (short messages), 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)	Multi-slot PD	Data transmission with up to 4 slots supporting up to 28.8 kbit/s gross
	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)	Integrated Openwave browser
		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
		AT Multiplexer - 4 Virtual Physical Port (simultaneous PD, SDS, AT commands and Air Tracer SESSIONS)
		TNP1; enables simultaneous PD and SDS sessions
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	N.A.	Group voice calls from DMO to TMO
	N.A.	Group voice calls from TMO to DMO
	N.A.	Emergency group call from DMO to TMO
	N.A.	Emergency group call from TMO to DMO
	N.A.	Transmission of Gateway Presence Signal
	N.A.	Automatic detection and management of co-located Gateways
	N.A.	Call Pre-emption (in either direction)
	N.A.	SDS messaging from DMO to TMO (including GPS) or from TMO to DMO*
	N.A.	Configurable routing of SDS messages to console or PEI
	N.A.	Intelligent handling of point to point calls and SDS messages whilst operating as a Gateway

* Future software release

REPEATER SERVICES

	MTM5200	MTM5400	MTM5500
DMO Repeater	N.A.	Repeats DMO voice and tone signalling on selected talkgroup	
	N.A.	Repeats SDS and Status messaging on selected talkgroup*	
	N.A.	ETSI type 1A DMO Repeater for channel efficient operation	
	N.A.	Transmission of Repeater Presence Signal	
	N.A.	Priority Call	
	N.A.	Emergency Call (Pre-emptive Priority Call)	
	N.A.	E2EE Encrypted DMO traffic	
	N.A.	Monitoring of and participation in calls whilst in Repeater mode	
	N.A.	Configurable Repeater Power Levels	

INTERFACES

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)
		USB 2.0 support for PEI (Four Virtual Ports via AT Multiplexer 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 (GCAI)		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	Algorithms	TEA1, TEA2, TEA3
	Security Classes	Class 1 (Clear), Class 2 (SCK), Class 3G
	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 (EtEE)	Voice E2EE	Enhanced End to End Encryption with OTAR supported through Universal Crypto Module (UCM) and SIM (via integrated card slot)
	Packet Data E2EE	
	Short Data (SDS) E2EE	

REGULATORY COMPLIANCE

Radio (R&TTE Article 3.2)	EN 303 035-1
	EN 303 035-2
	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 60950-1 (2001)
	EN50360:2001 EME
Environmental	Directive 2002/96/EC WEE
	Directive e2002/95/EC RoHS
Automotive	E-mark, Automotive EMC Directive 95/54/EC

* Future software release

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