


Brochure



# MXM600 TETRA mobile radio

Frontline safety, today and tomorrow



The MXM600 takes on the challenges of the front line, keeping your teams safe while they deal with the safety of others. It has been designed to provide reliable in-vehicle TETRA coverage for voice and data communications, as well as extend the coverage of TETRA portable radios via its gateway and repeater capability.





# MXM600

## Frontline safety, today and tomorrow.

Clarity of voice communication is critical in order to get vital messages across. Noise reduction technology, trained through Artificial Intelligence (AI) machine-learning, is integrated in the MXM600 to suppress background noise and improve clarity of calls — so users can hear and be heard, even in noisy conditions.

We designed the MXM600 to be easy to install and automated some of the configuration work needed when setting up a mobile radio. The MXM600 is highly flexible when it comes to installation options — it can support two control heads from one transceiver, and also has the ability to control two transceivers from one control head. Whether you are looking to install the radio in a car, fire engine, van, ambulance, train, boat or on a motorcycle — there are installation options for you.

With a large screen and intuitive hardware controls on the control head, the MXM600 is easy to use. However, for deeper interactions with the radio, users can take advantage of the collaborative M-Radio Control app on a Bluetooth-paired smartphone or tablet.

The MXM600 helps reduce your total cost of ownership. Expensive and time-consuming radio management chores are streamlined with Wi-Fi Over-The-Air Programming, to become fast and cost effective. And you can re-use all of your MTM5000 series audio accessories and most of your MTM5000 series cabling<sup>1</sup> too.

The radio offers features to take advantage of today, such as secure Bluetooth® 5.3 and the M-Radio Control app, as well as features for tomorrow, such as High Definition (HD) voice hardware. These features help protect your investment and ease any adoption of 4G and 5G mobile broadband — allowing you to continue to communicate using the same radios.

The MXM600 is a mobile radio that gives your frontline users the confidence to support their community. Ready to respond to sudden changes in the field and future changes in technology, it helps equip your front line to efficiently and effectively get the job done.



<sup>1</sup> Some power cables and adapters will not be compatible, please speak with your Motorola Solutions representative for more details.





## Mission-critical TETRA mobile radio

### Rely on TETRA voice and data communications.

The MXM600 has been designed to provide reliable in-vehicle TETRA coverage for voice and data communications, as well as extend the coverage of TETRA portable radios.

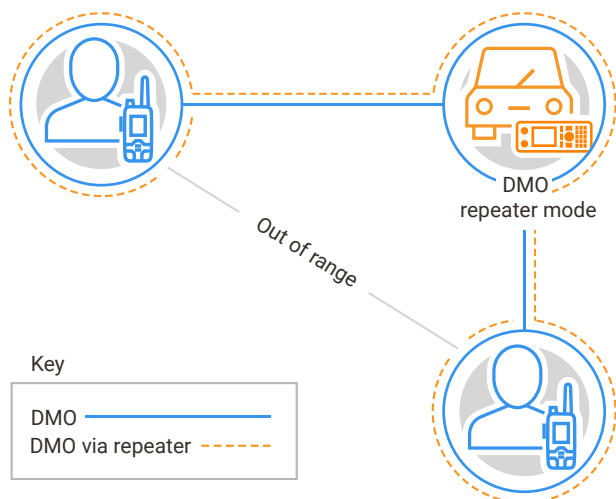
The MXM600 with an external roof-mounted antenna has high receiver sensitivity and supports higher transmission power than a portable radio. It can provide up to TETRA power class 2, 10 W, transmission power, providing greater range than a power class 3 or 4 radio. This allows users to maintain conversations, send SDS messages and make emergency calls even in marginal coverage areas. With Repeater and Gateway functionality, this coverage capability can be extended to nearby TETRA portable radios, to keep your users connected.

Maintain conversations,  
send SDS messages,  
and make emergency  
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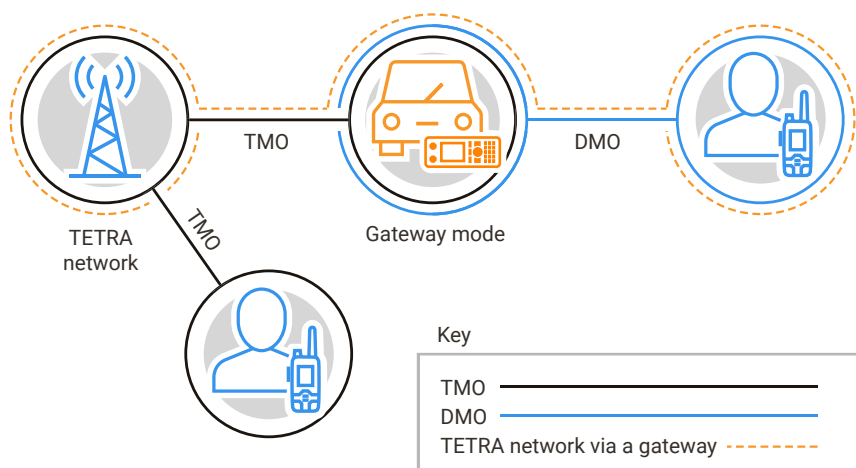
## DMO repeater functionality

The MXM600 has DMO repeater functionality to act as a bridge between radio users who are out of coverage of each other, but within coverage of the MXM600. This can be used to extend DMO range by retransmitting group calls, private calls and data from one TETRA radio to another.



## Gateway to a TETRA network

When in gateway mode, the MXM600 acts as a bridge between TETRA radios that are out of coverage and the TETRA network, to preserve trunked communications. For example, police officers investigating inside a building with thick walls may lose network coverage on their portable TETRA radios. However, with the MXM600 mobile radio acting as a gateway, the officers only need their portable radios to reach the MXM600 in the car outside via DMO, and the MXM600 provides the connection to the TETRA network via TMO.



## TETRA wideband support

The MXM600 supports a wide frequency range of 350-470 MHz or 806-870 MHz. This wideband capability provides flexibility and scope to find the right frequencies to use for your circumstances. A magnetic-mount antenna and a roof-mounted antenna are available – both support the whole 350-470 MHz or 806-870 MHz frequency band.







## Mission-critical audio

The MXM600 utilises our latest audio technology to deliver loud and clear audio so that your users can communicate with confidence.

### AI-trained noise suppression for clear voice communication

Deep-learning Artificial Intelligence (AI) technology has been used to enhance noise suppression. The microphone audio is processed by the radio, transmitting the user's voice while suppressing other sounds — including extreme noise types such as sirens, crowd noise and fire engine water pumps. The result is significantly improved voice call clarity and intelligibility, even with extreme background noise. The noise suppression of the MXM600 also works with existing MTM5000 series audio accessories.

You can also select the level of background noise suppression. You may want to eliminate the maximum amount of background noise, or you may want to let some through for the listener to have contextual awareness. The level of noise suppression can be selected both in the codeplug and from the radio menu.

MXM600 integrates Artificial Intelligence trained noise reduction technology to suppress background noise for enhanced, clear voice communications.

### Echo cancellation

Reduce the risk of echo when using a visor mic and a loudspeaker on a full duplex call.

In a vehicle, noise from the loudspeaker could enter the microphone and create an echo on the call. The MXM600's state-of-the-art echo cancellation technology<sup>2</sup> reduces the need to adjust the loudspeaker volume, so users can concentrate on their task.

### Howling suppression

Frontline personnel often work in teams. Using multiple radios in close proximity to one another can sometimes cause acoustic feedback: howling and distortion, compromising radio communications.

The AI-trained noise suppression also works to suppress acoustic feedback. This enables teams and individuals to focus on the task at hand, rather than being distracted by having to lower audio volume or change acoustic feedback suppression settings manually.

### Bluetooth audio

The MXM600 has Bluetooth® 5.3 for audio and data transfer. This makes it easy to connect to Bluetooth accessories, including remote speaker microphones and headsets.

### Wideband loudspeaker

Future-proof your audio experience. The MXM600 can work with the Motorola Solutions 15 W wideband external loudspeaker — ready for high-definition, wideband audio.

<sup>2</sup> Actual results depend on the vehicle, the distance between the speaker and microphone and where the speaker and the microphone are in relation to each other.





## Location accuracy for safety and incident management

When the unexpected happens, it's important to know exactly where your people are. Being able to pinpoint a front line worker's location to just a few metres can make all the difference in keeping them safe and effectively managing an incident.

The MXM600 supports four Global Navigation Satellite Systems<sup>3</sup> (GNSS) including GPS, Galileo, BeiDou, and GLONASS. It also works with regional Satellite Based Augmentation Systems (SBAS), such as Japan's QZSS.

A combination of GPS plus Galileo provides location accuracy down to 1.0 metres<sup>4</sup>.

The MXM600 has an built-in accelerometer and is hardware-ready to support automated alerts, such as crash detection. If an automated alert is raised or if the emergency button has been activated on the MXM600, the more accurate the location information than can be provided to the dispatchers, the faster help can arrive.



<sup>3</sup> Dual GNSS configuration: GPS plus Galileo, GPS plus GLONASS, or GPS plus BeiDou.

<sup>4</sup> Using industry-standard test protocol. Horizontal Accuracy, 2D <1.0 m (95% probable, -130 dBm, >15 SVs Galileo & GPS).







## Rugged and ready for action

Your personnel and vehicles work in all kinds of conditions and environments.

The rugged MXM600 is ready to handle extreme temperature and vibration. It has been tested to the MIL-STD-810H military standard developed by the U.S. Department of Defense. It has also been tested to European standards: ETSI 300 019, and rail certification: EN50155 and IEC60571 ED.3.0.

With an IP54 rating, the MXM600 transceiver is also protected from limited dust ingress and water spray from any direction — both with and without cable connections.

We have also simulated vehicle crashes to test that the transceiver remains in place in the event of a vehicle collision.

With an IP54 rating, the MXM600 transceiver is protected from limited dust ingress and water spray from any direction.





## Secure communications

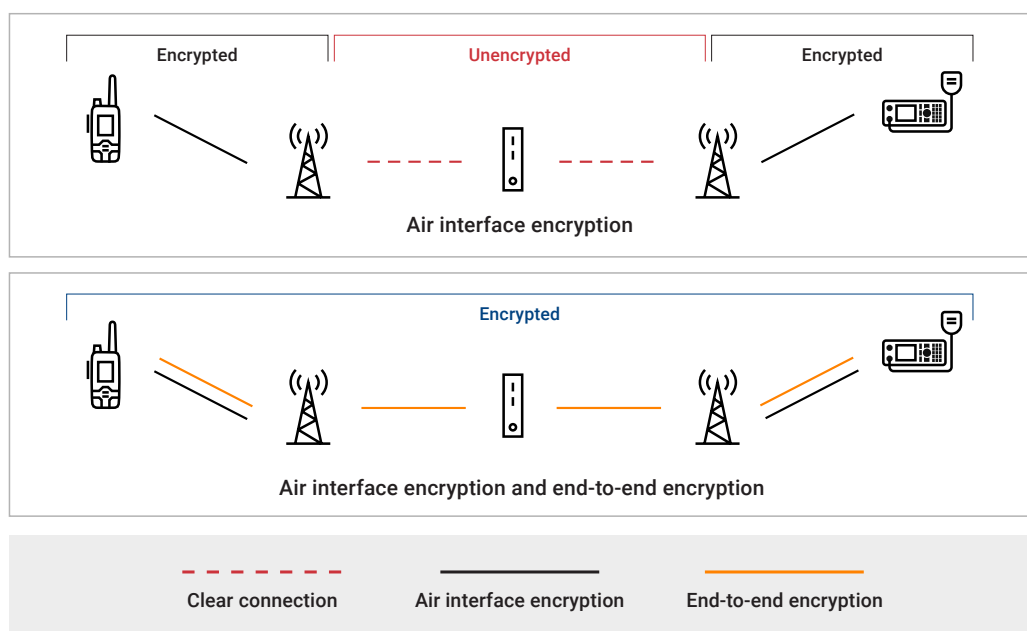
Threats against public safety communications and critical infrastructure are growing in reach and sophistication.

That's why it's important that your communications system uses the most modern security practices and complies with security guidelines. The MXM600 has multiple levels of security to protect your mission-critical TETRA data and communications.

### Layered security

The MXM600 security features include:

- Air Interface Encryption<sup>5</sup> (AIE) where data and communications are encrypted between terminals and base stations.
- End-to-End Encryption (E2EE) closes the gap of unencrypted communications through the TETRA network infrastructure. It is available on the MXM600 via optional Hardware Security Modules (HSM), designed card according to FIPS 140-2 level 3 hardware specifications. The HSMs use 128 bit AES or 256 bit AES to encrypt voice, data and location information from sender to receiver. E2EE is also available via a SIM Card<sup>6</sup>.
- Over-The-Air-Rekeying<sup>7</sup> (OTAR) and Over-The-Air Keying<sup>8</sup> (OTAK) enable radio users to stay out in the field and have their device encryption keys remotely managed.



### Hardware ready for TEA 5, TEA 6 and TEA 7

The MXM600 is hardware ready to support dual Air Interface Encryption algorithms<sup>9</sup>. It can support the following combination of new algorithms<sup>9</sup>, depending on the requirements of the network: TEA 1 and TEA 7; TEA 2 and TEA 5; TEA 3 and TEA 6.

### Secure Bluetooth 5.3

The MXM600 uses Bluetooth<sup>®</sup> 5.3 with Secure Connections (used in security mode 4, level 4 as recommended by NIST<sup>10</sup>). Secure Connections utilises the most up-to-date Bluetooth security practices, including the military-grade Advanced Encryption Standard (AES) algorithm, with 128-bit key length.

<sup>5</sup> MXM600 supports TEA 1, TEA 2, TEA 3 and is hardware ready for TEA 5, TEA 6 and TEA 7.

<sup>6</sup> BSI SIM card for German Public Safety customers.

<sup>7</sup> All OTAR of all ETSI specified AIE Cypher Keys are supported including Group Cypher Key (GCK), Common Cypher Key (CCK) and Static Cypher Key (SCK).

<sup>8</sup> Supports End-to-End Encryption Key Materials.

<sup>9</sup> Subject to development and regulatory approval.

<sup>10</sup> <https://csrc.nist.gov/publications/detail/sp/800-121/rev-2/final>.





# Designed for low total cost of ownership

## Streamlined field deployment

The MXM600 makes a sound financial choice with a low cost of ownership, saving money upfront and over the course of many years.

It has an intuitive and familiar look and feel, requiring minimal training, so your users can get up and running quickly and easily. We've also made the MXM600 easy to install in the field, with physical mounting guides in the transceiver trunion, and by automating some of the configuration work needed when setting up a mobile radio.

### Quickly upgrade from MTM5000 series radios

Upgrading from an MTM5000 series mobile radio is easy, as the MXM600 is compatible with most of the cabling<sup>11</sup> and with all of your MTM5000 series audio accessories.

### Reuse your programming tools

The MXM600 uses the same Integrated Terminal Management (iTM) and Customer Programming Software (CPS) tools as other TETRA radios from Motorola Solutions — for fast and easy programming of your fleet.

### Automated control head detection

The MXM600 can detect when a control head has been plugged in and automatically configure itself for the control head.

### Automated control head software alignment

If the control head software doesn't match the software version on the transceiver, the MXM600 transceiver will automatically program the control head with appropriate software<sup>12</sup>.

### Automated configuration

You can use a single codeplug for your MXM600 radios. Each transceiver will automatically detect and use the relevant codeplug fields for its configuration (Dash / Desk, Single Remote, Dual Remote or Databox).

### Menu options for configuration

Rather than having to send the radio back for re-programming if the installation needs to differ from the intended plan, the installer can use the menu on the control head to change the configuration of the radio.

<sup>11</sup> Some power cables and adapters will not be compatible, please speak with your Motorola Solutions representative for more details.

<sup>12</sup> Requires both the transceiver and control head to have at least MR2024.1 for 350-470 MHz or MR2024.1b for 806-870 MHz.







Radio administrators can take advantage of Wi-Fi for device programming and updates. Planned upgrades that would have taken months can now be done in a few days or a few hours.

## Over-the-air updates for simplified fleet management

The MXM600 supports both 2.4GHz and 5GHz bands of Wi-Fi. Radio administrators can take advantage of Wi-Fi for device programming and updates. Planned upgrades that would have taken months can now be done in a few days or a few hours.

Wi-Fi connections are secured via the Transport Layer Security (TLS1.2) protocol to ensure the data pipe between the device and the server is secure and data integrity is guaranteed.

Instead of having to physically update each mobile device, the MXM600 can be updated as soon as the vehicle is in range of preconfigured Wi-Fi. This reduces the hassle and operational downtime associated with upgrades and means that updates can be performed securely anywhere the MXM600 can access preconfigured Wi-Fi.







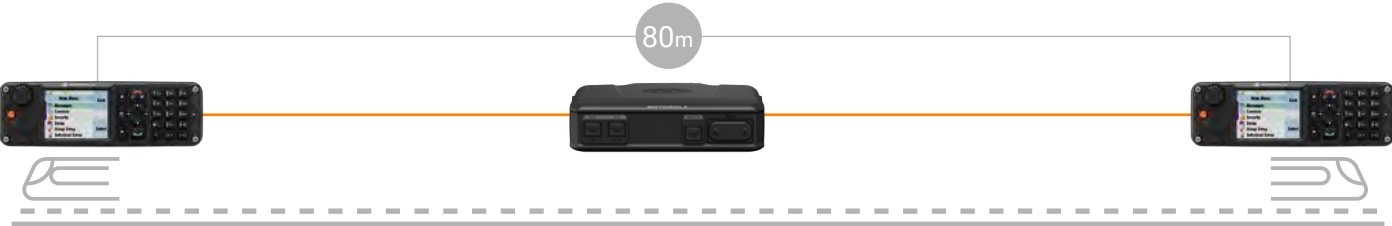
# Flexible configuration

## Multiple configuration options to suit your needs.

The MXM600 is highly flexible when it comes to installation options.

The MXM600 is DIN centre console mounting compatible and is available in dash / desk, remote control head, and motorcycle-mount formats. Whether you are looking to install the radio in a car, fire engine, van, ambulance, train, boat or on a motorcycle — there are installation options for you.

For installations in long vehicles, RJ50 Ethernet style connections enable up to 40 metre distance between the MXM600 transceiver and its remote control head — with a single cable for both power and data. With the Dual Remote transceiver model, remote control heads can be up to 80 metres from each other.



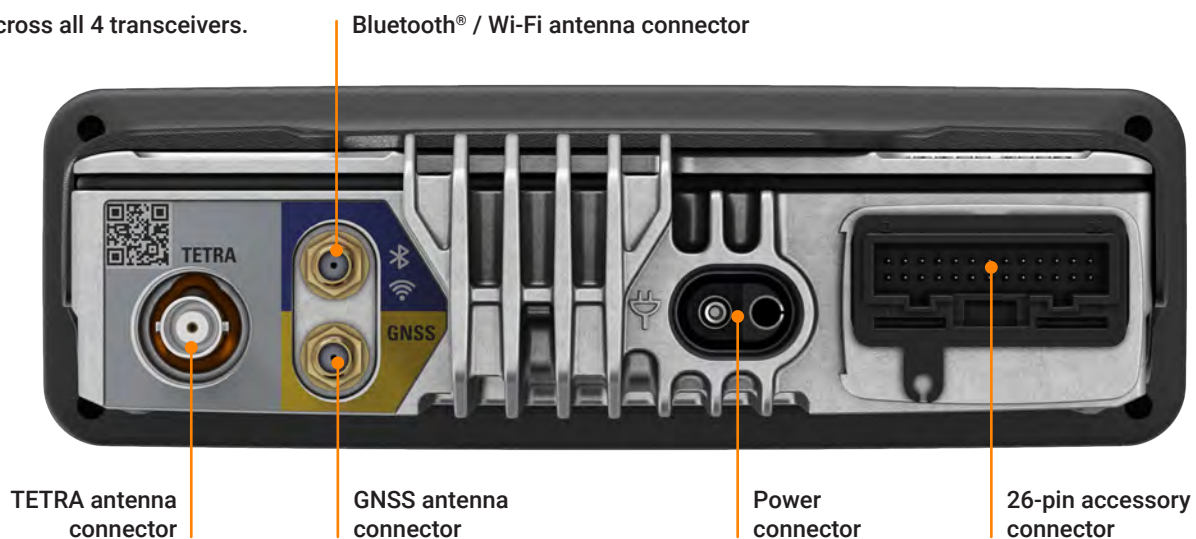


## TETRA transceiver



## Back of the transceiver

Common across all 4 transceivers.



## Transceiver models

The MXM600 is designed for a long service life. The transceiver is rated at IP54 and complies with MIL-STD-810H. There are 4 models of transceiver<sup>13</sup>.

### Single remote

The single remote model enables one Ethernet control head to be connected.



RJ50 control head connector

### Databox

The databox model can have a single Ethernet control head connected to the RJ50 connector. It has an RS232 port to connect to other data systems or for Peripheral Equipment Interface (PEI) purposes, such as to connect to a virtual control head. There is also a multi-purpose 25-pin connector for backwards compatibility.



RJ50 control head connector

25 SUBD connector

RS232 port

### Dash/desk mount

The dash/desk mount model comes with the control head already attached to the transceiver.



Emergency button

Large rotary control knob

GCAI MMP connector<sup>14</sup>

Status LED

Keypad with 15 programmable buttons

<sup>13</sup> Note the transceivers on page 14 and 15 are shown with their dust covers removed to show the ports.

<sup>14</sup> This is used for audio accessories and programming.







## Dual remote

The dual remote model provides a flexible configuration as it can support two control heads connected to one transceiver, and also has the ability to control two transceivers from one control head. With two control heads connected to one transceiver, users in the front and back of a fire engine, ambulance, train or boat can remotely control the same radio. With one control head controlling two transceivers, a single user can switch between radio transceivers, for example one using TMO and the other DMO from one location. Controlling multiple transceivers from one control head is also a solution for multiple-agency, joint operations, or multi-task communications — including cross-border operations.

There is an RS232 port to connect to other data systems or for Peripheral Equipment Interface (PEI) purposes, such as to connect to a virtual control head. There is also an Ethernet port for LAN connectivity.

RJ50 control head connectors



Remote Ethernet control head (RECH)

Ethernet/SIM port

RS232 port

Telephone style control head (TSCH)



The MXM600 can support two control heads connected to one transceiver, and has the ability to control two transceivers from one control head.



## Remote control heads

There are three TETRA remote control heads to choose from, or you can take advantage of a variety of third party control head solutions from our application partners.

The MXM600 remote TETRA control heads have 15 programmable buttons for activating frequently used functions. They also all have a prominent emergency button that is protected from accidental activation, and a large dual-function rotary knob for volume and talkgroup selection. To minimise training requirements, our MXM600 compatible control heads have a user interface similar to our proven range of portable radios.

With the dual remote transceiver model, remote control heads can be up to 80 metres from each other.

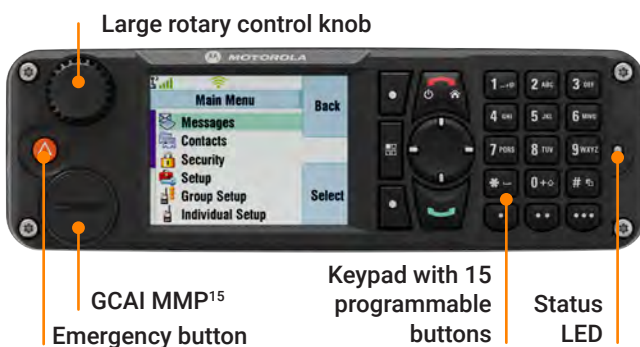
### IP54 remote Ethernet control head

The IP54 remote Ethernet control head (RECH) can either be mounted on a trunnion or in a DIN mount and connects to a transceiver via an RJ50 cable



### IP67 remote Ethernet control head

With its IP67 rating, this control head has been designed to cope with being used outside in harsh environments, such as being mounted with a trunnion on a motorcycle or boat. The control head connects to a transceiver via an RJ50 cable.



### Telephone style control head

The telephone style control head (TSCH) connects to a transceiver via an RJ50 cable. It is well suited for telephone style communications, supporting full duplex private calls as well as half duplex communications. The screen orientation is easily adjusted between horizontal and vertical to accommodate different fitting options. With its IP55 environmental protection rating, the TSCH is designed to be rugged and weather-resistant.



<sup>15</sup> This is used for audio accessories and programming.





## Accessories to meet your needs

Provide a mobile radio experience tailored to your team and their unique needs.

Bluetooth® 5.3 enables a range of wireless accessories, including remote speaker microphones and headsets. We also offer a wide range of installation kits, cables and audio accessories for the MXM600.

### Audio

WM500 bluetooth RSM



Wired fist mics



Wired handsets



Wired RSM



### Hands free audio

Gooseneck PTT



Visor mic



External speaker



### Installation kits

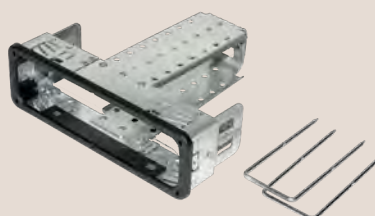
Remote control head trunnion



Transceiver trunnion



1-DIN unit



Cables



For a complete list of accessories available for the MXM600, please visit [www.motorolasolutions.com/MXM600](http://www.motorolasolutions.com/MXM600)



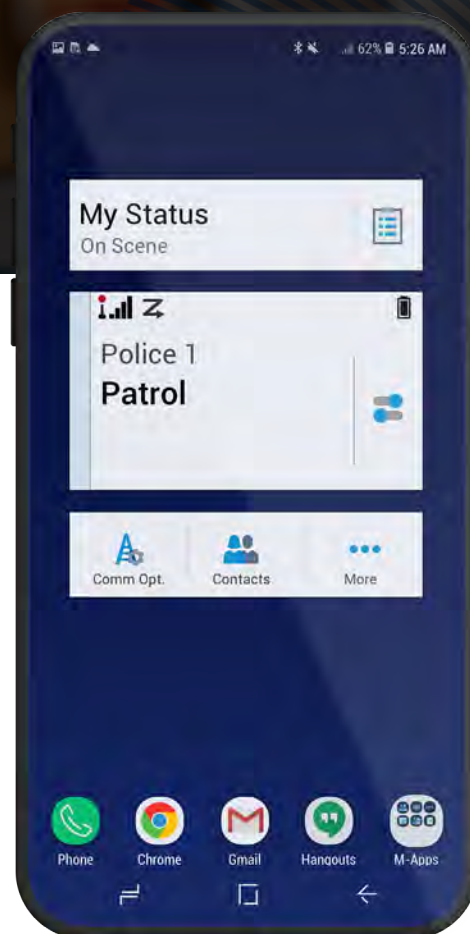


# Future-proof through collaboration

## Future-proof features protect your investment

With a working lifespan of many years, TETRA radios are an investment in the future. We've designed the MXM600 with features that you can take advantage of today, such as Bluetooth 5.3, as well as features for tomorrow, such as High Definition (HD) voice hardware.

Users can take advantage of the collaborative M-Radio Control app on a Bluetooth-paired Android™ smartphone or tablet.





## Radio Control from a smartphone or tablet

We've designed the MXM600 to be easy to use, with a large screen and intuitive hardware controls on the control head. However, for deeper interactions with the radio, users can take advantage of the collaborative M-Radio Control app<sup>16</sup> on a Bluetooth-paired Android smartphone or tablet. Example uses of the M-Radio Control app include searching for talkgroups, sending status updates and SDS messages. The app can also be used to remotely control the radio from outside the vehicle, such as switching the MXM600 into Gateway or Repeater mode before entering a building.

## Mission-critical communications today and tomorrow

The evolution of public safety means that more and more countries are deploying or planning to deploy mobile broadband for mission-critical communications alongside their TETRA networks.

The extra bandwidth available to broadband devices and their voice applications enables them to have greater audio quality than a narrowband radio. The MXM600 is hardware-ready for HD voice to support the delivery of high-fidelity voice when paired with a smartphone.

Use the MXM600 as a TETRA mobile radio today. And tomorrow use the MXM600 paired with a mobile broadband device to provide the vehicles PTT controls and HD audio, along with TETRA Direct Mode Operation (DMO) backup.

With fast and secure Bluetooth 5.3, the M-Radio Control app, and HD voice hardware, the MXM600

protects your investment and eases any adoption of 4G and 5G mobile broadband, allowing you to continue communicating using the same radios. The MXM600 provides mission-critical communications to your teams today and into the future.

## Expand your capabilities with GPIO

For future expansion of capabilities the MXM600 has a General Purpose Input/Output (GPIO) connector, which lets you connect the radio to other equipment. For example a programmable button on the control head could be assigned to operate the siren. The radio could also be configured so that if the vehicle door is opened, then the radio automatically goes into Gateway mode — extending coverage for officers leaving the vehicle and using their portable radios.

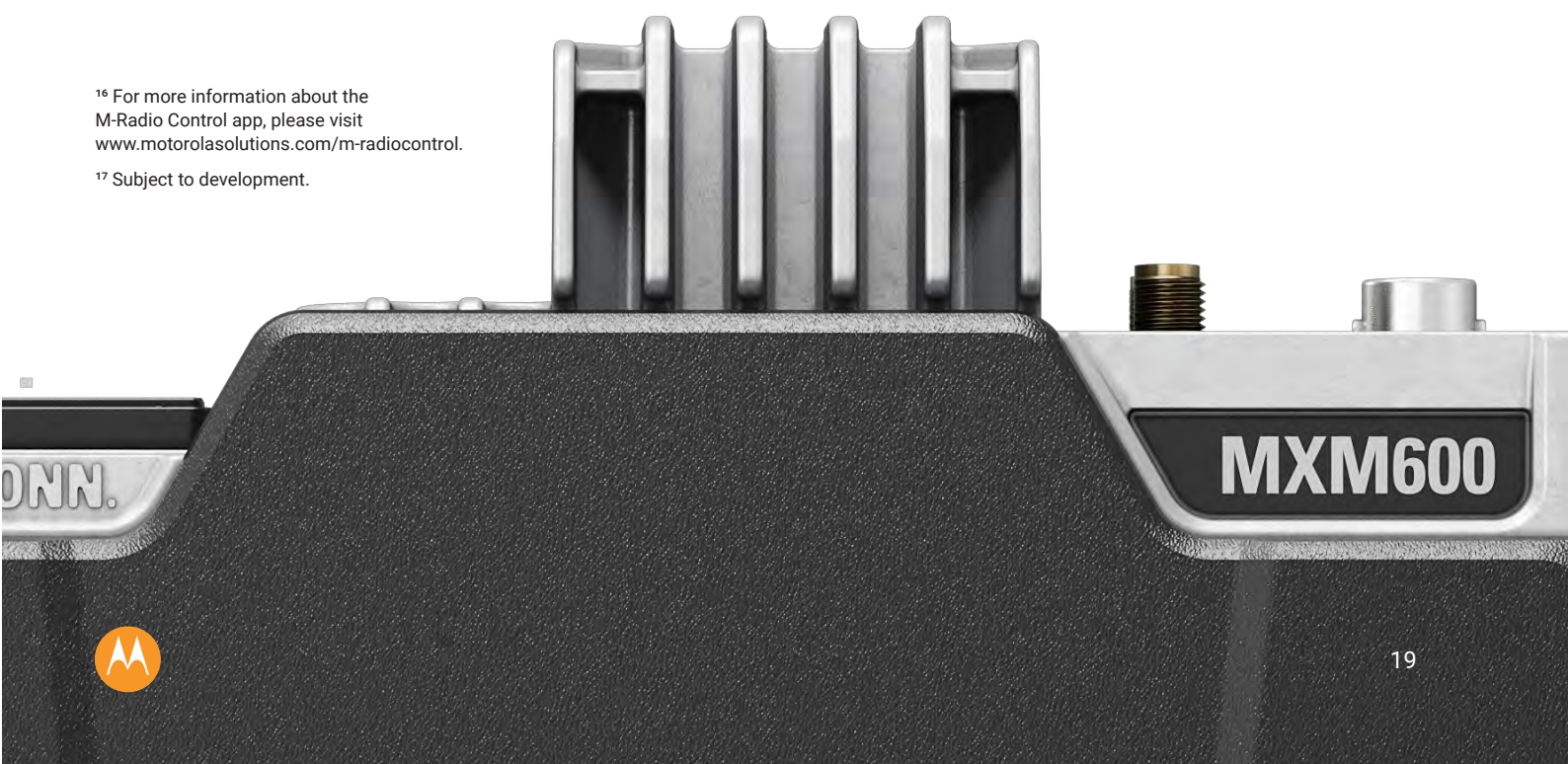
## Hardware-ready for ethernet connectivity via dual remote transceiver

The MXM600 transceiver can be connected to a LAN via Ethernet so that the transceiver can be controlled by a computer with a virtual control head or have its programming updated or radio logs retrieved over the LAN<sup>17</sup>.

The MXM600 provides mission-critical communications to your teams today and into the future.

<sup>16</sup> For more information about the M-Radio Control app, please visit [www.motorolasolutions.com/m-radiocontrol](http://www.motorolasolutions.com/m-radiocontrol).

<sup>17</sup> Subject to development.





# Get the most from your radios with support services

## Maximise the value of your MXM600 radios

To help support your MXM600 fleet and maximise the value of your investment, we offer a variety of service packages<sup>18</sup> that transfer the risk and responsibility of providing the right level of services for your needs to Motorola Solutions.

The service capabilities offered include:

### Hardware repair

Troubleshooting, testing and repairing your equipment at a centralised facility.

### Accidental damage

When the unexpected happens, we have you covered with a quick repair turnaround.

### Technical support and service desk

Remote technical support services to ensure your radios are rapidly restored and functional.

### Software maintenance

Access to the latest certified software releases for reliable and secure device operations.

You can rely on us to help you achieve your device performance targets and maximise the value of your radio investments.

<sup>18</sup> For the complete list of service packages, please talk with your local Motorola Solutions representative.

To learn more, visit: [motorolasolutions.com/MXM600](https://motorolasolutions.com/MXM600)

Motorola Solutions UK Ltd. Nova South, 160 Victoria Street, London, SW1E 5LB. [motorolasolutions.com](https://motorolasolutions.com)

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