MOTOTRBO™

Professional Digital Two-Way Radio System
DM 3400/3401/3600/3601 Mobile Radios

MOTOROLA

CLARITY

PRODUCTIVITY

VERSATILITY

VALUE

Shift into digital.

Introducing MOTOTRBO Professional Digital Two-Way Radio System. The future of two-way radio.

The next-generation professional two-way radio communications solution is here, with more performance, productivity and value, thanks to digital technology that delivers increased capacity and spectrum efficiency, integrated data communications and enhanced voice communications. MOTOTRBO is ideal for professional organisations that need a customisable, business-critical communication solution using licensed spectrum.

Unique MOTOTRBO System Benefits for Enhanced Productivity

MOTOTRBO offers a private, standards-based, highly cost-effective solution that can be tailored to meet your unique coverage and feature needs. This versatile portfolio provides a complete system of portable radios, mobile radios, repeaters, accessories, services and a complete solution. MOTOTRBO:

- Uses Time-Division Multiple-Access (TDMA) technology to provide **twice the calling capacity** (compared to analogue or FDMA radios) for the price of one license. A second call does not require a second repeater, saving you equipment costs.

- **Doubles the number of users** you can have on a single licensed 12.5 kHz channel - with no monthly fees.

- **Integrates voice and data** to increase operational efficiency and support a wide range of applications. Through Motorola's Application Partner Programme customers and system integrators can have access to advanced features and build on their investment.

- Provides **clearer voice communications** over a greater range than comparable analogue radios, rejecting static and noise.

- Offers **enhanced battery life**. Digital TDMA two-way radios can operate up to 40 percent longer between recharges compared to typical analogue radios.

- Enables **additional functionality** including dispatch data, and enhanced call signaling.

- Provides **easy migration** from analogue to digital with the ability to operate in both analogue and digital modes.

- Meets **demanding specifications** - U.S. Military 810 C, D, E, and F, IP57 for submersibility (portable models), and Motorola standards for durability and reliability.

- Uses the **IMPRES™ Smart Energy System** to automate battery maintenance, optimise life cycle and maximise talk time.

DM 3600/3601

Enhanced Display Mobile Radios

1. Accessory connector supports USB and enhanced audio capability.

2. Multi-colored LED indicators for clear, visible feedback of calling, scanning and monitoring.

3. Large, easy-to-use volume knob.

4. DM 3601 includes integrated GPS module.

5. 160 channels.

6. Powerful, front-projecting speaker.

7. Large, easy-to-use navigation buttons allow easy access to intuitive, menu-driven interfaces.

8. Flexible, menu-driven interface with user-friendly icons or two lines of text for ease of reading text messages.

9. Four programmable buttons for easy access to favourite features. New features such as one-touch calling and text messaging are made even easier through programmable button access.

10. Compact and ergonomically friendly microphone.

Display Mobile Radio Standard Package

- Radio with Display Control Head
- Trunnion
- Cabling (power cord)
- Compact Microphone
- Quick Reference Guide

Additional Features

- Enhanced call management

  Encode/decode: emergency, remote monitor, push-to-talk ID, radio check, all call, radio disable

- DM 3601 can transmit GPS coordinates

- Dual-mode analogue/digital scan - facilitates a smooth migration from analogue to digital

- Short free-form and quick text messaging

DM 3400/3401

Numeric Display Mobile Radios

1. Accessory connector supports USB and enhanced audio capability.

2. Multi-colored LED indicators for clear, visible feedback of calling, scanning and monitoring.

3. Large, easy-to-use volume knob.

4. DM 3401 includes integrated GPS module.

5. Large, easy-to-use channel navigation buttons.

6. Powerful, front-projecting speaker.

7. 32 channels; channel number is easy to read on large, clear numeric two-digit display.

8. Two programmable buttons for easy access to favourite features. New features such as one-touch calling are made even easier through programmable button access.

9. Compact and ergonomically friendly microphone.

Numeric Display Mobile Radio Standard Package

- Radio with Numeric Display Control Head
- Trunnion
- Cabling (power cord)
- Compact Microphone
- Quick Reference Guide

Additional Features

- Enhanced call management

  Encode: emergency, push-to-talk ID
  Decode: radio check, remote monitor, radio disable, all call

- DM 3401 can transmit GPS coordinates

- Dual-mode analogue/digital scan - facilitates a smooth migration from analogue to digital

- Send quick text messaging via programmable buttons

MOTOTRBO Integrated Data Enables Advanced Applications

MOTOTRBO is changing the way businesses communicate. New functionality, features and well-documented interfaces embedded in the radio opens up new possibilities. Through Motorola's Application Partner Programme customers and system integrators can have access to these advanced features and build on their investment and add new high-value capabilities published.

MOTOTRBO Application Partner Programme

Customising communications technology to enhance safety and increase operational efficiency is important to customers in all industries. Third-party developers play an important role in supporting the market growth of the MOTOTRBO platform and in creating customised applications that will add value to customers in different vertical markets. Developers will extend the capabilities of MOTOTRBO and provide niche solutions that will satisfy a broad range of customer needs.
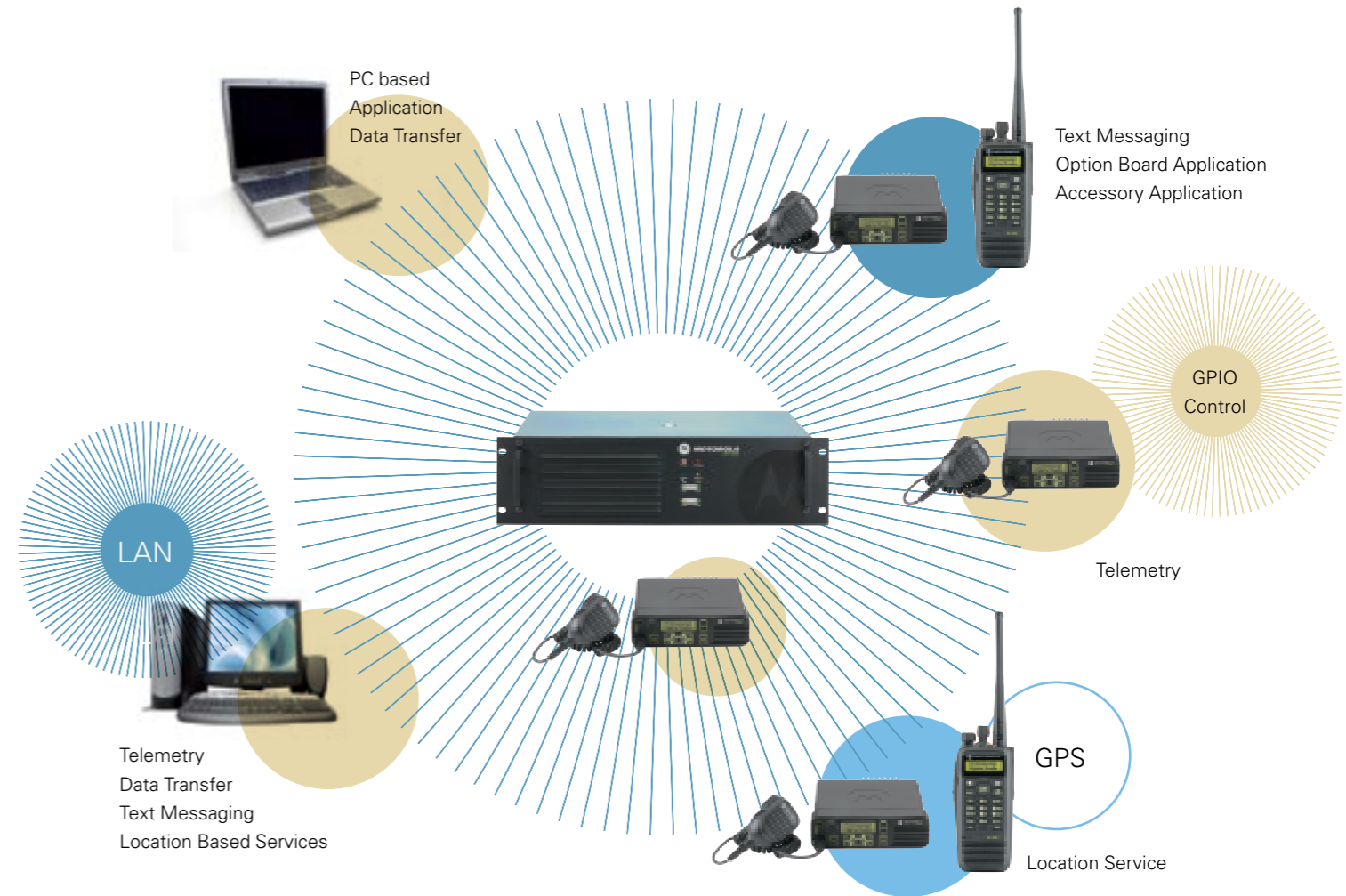
To encourage the development of a broad portfolio of customer-focused solutions and continuing innovation, MOTOTRBO is integrated in the successful running Professional Radio Application Partner Programme. Accredited partners get access to the protocol and Application Programming Interface (API) documentation as well as online support. Available and successful running solutions will be promoted through a joined partner and Motorola marketing.

So when you recognise an opportunity to customise an end user solution through the use of an application, contact the Motorola Application Developer Programme manager for support.

Extending functionalities

Embedded functionality together with the Application Partner Programme is the way to extend the MOTOTRBO product. A MOTOTRBO application partner will have access to the Application Development Kits allowing partners to customise a solution specifically to a customers need. Several Application Development Kits are available to deliver a range of services.

PC based Application Data Transfer

Text Messaging
Option Board Application
Accessory Application

GPIO Control

Telemetry

LAN

Telemetry
Data Transfer
Text Messaging
Location Based Services

GPS

Location Service

Location Services

A location service provides the ability to track people and assets, such as vehicles. This advanced approach takes advantage of the GPS- receiver integrated within both the portable and mobile radios, combined with the software applications from one of the many MOTOTRBO application partners.

GPS-equipped portable and mobile radios can be configured to transmit their geographical coordinates at pre-programmed intervals, on demand and in case of an emergency. Software applications provide dispatchers with a real-time display of fleet activity on a customised, high-resolution, color-coded map. Using a location service application and MOTOTRBO's integrated GPS, your customers can enjoy the benefits of location tracking.

Text messaging services

A text messaging service allows communication between radios and dispatch systems, between radios and email-addressable devices, and to remote PC clients attached to radios.

Through an application from a MOTOTRBO application partner, the computer software application adds a PC-based, client/server software application for dispatch-oriented messaging to the system, which extends the capabilities of messaging to include communications between radios and dispatcher PCs. Furthermore, the dispatcher PC can act as a gateway to email, enabling messaging between email-addressable devices and radios.

Basic telemetry services

MOTOTRBO can be configured and customised for telemetry operation. A PC application interoperating with a MOTOTRBO radio can control inputs and outputs of the radio. This allows for a range of basic telemetry services such as automated readings, monitoring & control and equipment monitoring.

Mobile Radio

Part Number	Description
Audio	
RMN5052	Compact Microphone
RMN5065	Keypad Microphone with Enhanced Audio
RMN5053	Heavy Duty Microphone with Enhanced Audio
RMN5054	Visor Microphone with Enhanced Audio
RMN5050	Desktop Microphone
Loudspeakers	
RSN4002	13 Watt External Speaker
RSN4003	7.5 Watt External Speaker
RSN4004	5 Watt External Speaker
Desktop	
RSN4005	Desktop Tray with Speaker
GLN7318	Desktop Tray without Speaker
HPN4007	Power Supply and Cable (25 - 60 Watt Models)
HPN4008	Power Supply and Cable (1 - 25 Watt Models)
GPN6145	Switchmode Power Supply (1 - 25 Watt Models)
GKN6266	Power Supply Cable
HKN9088	Mobile Mini U Antenna Adapter - 8 ft Cable
PMLN5072	Hardware Kit for Rear Accessory Connector
Mounting	
RLN6077	Low Profile Trunnion Kit
RLN6078	High Profile Trunnion Kit
RLN6079	Key Lock Trunnion Kit
RLN5933	In Dash (DIN) Mounting Kit
Cables	
RKN4136	Ignition Sense Cable
HKN4137	Power Cable to Battery - 10 ft, 15 amp
HKN4192	Power Cable to Battery - 20 ft, 20 amp
PMKN4018	Mobile Rear Accessory Connector Universal Cable

Part Number	Description
Antennas	
The following antennas combine UHF and GPS capability.	
PMAE4030	Combination GPS / UHF 403-430 MHz, 1/4 Wave Roof Mount Antenna
PMAE4032	Combination GPS / UHF 406-420 MHz, 3.5 dB Gain Roof Mount Antenna
PMAE4031	Combination GPS / UHF 450-470 MHz, 1/4 Wave Roof Mount Antenna
PMAE4033	Combination GPS / UHF 450-470 MHz, 3.5 dB Gain Roof Mount Antenna
PMAE4034	Combination GPS / UHF 450-470 MHz, 5 dB Gain Roof Mount Antenna
The following antennas are intended for customers who have existing mobile antennas and need to add GPS capability.	
PMAN4000	Fixed Mount GPS Active Antenna
PMAN4002	Magnetic Mount GPS Active Antenna
The following antennas are intended for customers who do not plan to use the GPS capability of the radio.	
HAE4002	UHF 403-430 MHz, 1/ 4 Wave Roof Mount Antenna
HAE4003	UHF 450-470 MHz, 1/ 4 Wave Roof Mount Antenna
HAE4010	UHF 406-420 MHz, 3.5dB Gain Roof Mount Antenna
HAE4011	UHF 450-470 MHz, 3.5dB Gain Roof Mount Antenna
RAE4004	UHF 450-470 MHz, 5dB Gain Roof Mount Antenna
Miscellaneous	
RLN5926	Push Button PTT
RLN5929	Emergency Footswitch
HLN9073	Microphone Hang Up Clip (all microphones)
HLN9414	Universal Microphone Hang Up Clip (all microphones)
HKN9557	PL259 / Mini-U Antenna Adapter - 8" cable

A range of Motorola accessories are available to support the MOTOTRBO mobile radios. Mobile accessories are an important piece of the mobile solution in terms of installation and operational requirements. MOTOTRBO's range of mobiles is supported by accessories enabling flexible installation and operation in vehicles or desktop use.

Audio Solutions

Mobile Microphones enhances functionality of the mobile solution and helps ensure contact with the user and the team. Various microphones are available for different needs including standard microphone, keypad microphone to allow users to navigate menus and heavy duty microphone with enhanced durability and easier handling while wearing gloves. A visor microphone with enhanced audio is also available to be used with external PTT accessories to allow users hands free operation.

Other accessories are available for MOTOTRBO with specific needs in mind. An emergency footswitch is available allowing users to discretely notify about an emergency situation. External speaker and push-button PTT are available when operating in noisy environments or if hands free operation is required.

New Audio Accessory Interface Enables Enhanced Performance and Capabilities

Motorola digital technology enables breakthrough radio performance and features. And our new audio interface means MOTOTRBO accessories can offer your customers new performance and capabilities, too, now and in the future.

- Accessory programmable buttons can be programmed to any feature available in the radio, rather than being linked to radio programmable button programming. This allows the accessory programmable buttons to have independent programmable features.

- The new portable connector design meets IP57 submersibility requirements. This allows for use with submersible accessories such as the submersible remote speaker microphone.

- The new portable interface design incorporates the antenna signal within the audio connectors, which allows for easy use of accessories that require an RF signal, such as public safety speaker microphones.

- The new connector design also incorporates USB capability, which allows for the development of USB-capable accessories.

- The new audio accessory interface is the Motorola standard audio accessory interface for two-way portable and mobile radios.

- In addition, the interface incorporates the capability for enhanced audio functionality, industry unique technology that allows for communication between the radio and the audio accessory. Accessory identification is sent to the radio enabling the radio to help optimise its output for each type of audio accessory. This results in more consistent output across all audio accessory types.

DM 3600/3601 Enhanced Display Mobile Radios

Specifications

GENERAL SPECIFICATIONS

Channel Capacity	160
Typical RF Output	
Low Power	1-25 W
High Power	25-40 W
Frequency	403-470 MHz
Dimensions (HxWxL)	51 x 175 x 206 mm
Weight	1.8 kg
Current Drain:	
Standby	0.81 A max
Rx @ Rated Audio	2 A max
Transmit	1-25W: 11.0A max
	25-40W: 14.5A max

RECEIVER

Frequency	403-470 MHz
Channel Spacing	12.5 kHz/ 25 kHz
Frequency Stability	+/- 1.5 ppm (DM 3600)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DM 3601)
Analogue Sensitivity	0.30 uV (12 dB SINAD)
	0.22 uV (typical) (12 dB SINAD)
	0.4 uV (20 dB SINAD)
Digital Sensitivity	5% BER: 0.3 uV
Intermodulation	70 dB
Adjacent Channel Selectivity	60 dB @ 12.5 kHz,
	70 dB @ 25 kHz
Spurious Rejection	70 dB
Rated Audio	3 W (Internal)
	7.5 W (External - 8 ohms)
	13 W (External - 4 ohms)
Audio Distortion @ Rated Audio	3% (typical)
Hum and Noise	-40 dB @ 12.5 kHz
	-45 dB @ 25 kHz
Audio Response	+1, -3 dB
Conducted Spurious Emission	-57 dBm

TRANSMITTER

Frequency	403-470 MHz
Channel Spacing	12.5 kHz / 25 kHz
Frequency Stability	+/- 1.5 ppm (DM 3600)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DM 3601)
Power Output	
Low Power	1-25 W
High Power	25-40 W
Modulation Limiting	+/- 2.5 kHz @ 12.5 kHz
	+/- 5.0 kHz @ 25 kHz
FM Hum and Noise	-40 dB @ 12.5 kHz
	-45 dB @ 25 kHz
Conducted / Radiated Emission	-36 dBm < 1 GHz
	-30 dBm > 1 GHz
Adjacent Channel Power	-60 dB @ 12.5 kHz
	-70 dB @ 25 kHz
Audio Response	+1, -3 dB
Audio Distortion	3%
Digital Vocoder Type	AMBE++
Digital Protocol	ETSI-TS102 361-1

GPS

Accuracy specs are for long-term tracking (95th percentile values > 5 satellites visible at a nominal -130 dBm signal strength)

TTFF (Time To First Fix) Cold Start	< 1 minute
TTFF (Time To First Fix) Hot Start	< 10 seconds
Horizontal Accuracy	< 10 meters

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-30° C / +60° C
Storage Temperature	-40° C / +85° C
Temperature Shock	Per MIL-STD
Humidity	Per MIL-STD
Water and Dust Intrusion	IP54, MIL-STD

MILITARY STANDARDS

	810E		810F	
Applicable MIL–STD	Methods	Procedures	Methods	Procedures
Low Pressure	500.3	II	500.4	II
High Temperature	501.3	I/A, II/A1	501.4	I/Hot, II/Hot
Low Temperature	502.3	I/C3, II/C1	502.4	I/C3, II/C1
Temperature Shock	503.3	I/A, 1C3	503.4	I
Solar Radiation	505.3	I	505.4	I
Rain	506.3	I,II	506.4	I, III
Humidity	507.3	II	507.4	-
Salt Fog	509.3	I	509.4	I
Dust	510.3	I	510.4	I
Vibration	514.4	I/10, II/3	514.5	I/24
Shock	516.4	I, IV	516.5	I, IV

DM 3400/3401 Numeric Display Mobile Radios

Specifications

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Channel Capacity	32
Typical RF Output	
Low Power	1-25 W
High Power	25-40 W
Frequency	403-470 MHz
Dimensions (HxWxL)	51 x 175 x 206 mm
Weight	1.8 kg
Current Drain:	
Standby	0.81 A max
Rx @ Rated Audio	2 A max
Transmit	1-25W: 11.0A max
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Audio Response	+1, -3 dB
Conducted Spurious Emission	-57 dBm

TRANSMITTER

Frequency	403-470 MHz
Channel Spacing	12.5 kHz / 25 kHz
Frequency Stability	+/- 1.5 ppm (DM 3400)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DM 3401)
Power Output	
Low Power	1-25 W
High Power	25-40 W
Modulation Limiting	+/- 2.5 kHz @ 12.5 kHz
	+/- 5.0 kHz @ 25 kHz
FM Hum and Noise	-40 dB @ 12.5 kHz
	-45 dB @ 25 kHz
Conducted / Radiated Emission	-36 dBm < 1 GHz
	-30 dBm > 1 GHz
Adjacent Channel Power	-60 dB @ 12.5 kHz
	-70 dB @ 25 kHz
Audio Response	+1, -3 dB
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Low Temperature	502.3	I/C3, II/C1	502.4	I/C3, II/C1
Temperature Shock	503.3	I/A, 1C3	503.4	I
Solar Radiation	505.3	I	505.4	I
Rain	506.3	I,II	506.4	I, III
Humidity	507.3	II	507.4	-
Salt Fog	509.3	I	509.4	I
Dust	510.3	I	510.4	I
Vibration	514.4	I/10, II/3	514.5	I/24
Shock	516.4	I, IV	516.5	I, IV

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