



**MOTOTRBO™**

Professional Digital Two-Way Radio System



# ACCELERATE PERFORMANCE.



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

The next-generation professional conventional two-way radio communications solution is here, with enhanced performance, productivity and value – and more opportunity for you. With better basics and enhanced features, MOTOTRBO is Motorola's first digital conventional two-way radio system specifically designed to meet the requirements of professional organisations that need a customisable, business-critical communication solution using licensed spectrum.

MOTOTRBO combines the best in two-way radio functionality with digital technology to deliver increased capacity and spectrum efficiency, integrated data communications and enhanced voice communications.

MOTOTRBO provides easy migration from analog to digital, and it is an affordable digital conventional communication system for you.



## The Motorola MOTOTRBO Professional Digital Conventional Two-Way Radio System:

- **Includes everything** it takes to meet the business-critical needs of a wide range of users – portable radios, mobile radios, repeaters, accessories, applications and services.
- Uses Time-Division Multiple-Access (TDMA) technology to provide **twice the calling capacity** with one conventional channel license. A second call doesn't require a second repeater, so your customers save on equipment.
- **Doubles the number of users** who can be supported on a single licensed 12.5 kHz channel.
- **Integrates voice and data** to increase operational efficiency and support a wide range of applications. MOTOTRBO Text Messaging Services and MOTOTRBO Location Services (GPS location tracking) integrated applications are available now, with more to come through Motorola's Application Developer Program.
- Provides **clearer voice communications** over a greater range than comparable analog radios, rejecting static and noise.
- Offers **enhanced battery life**. Digital TDMA two-way radios can operate up to 40 percent longer between recharges as compared to typical analog radios.
- Enables **additional functionality** including dispatch data and enhanced call signaling.
- Provides **easy migration** from analog to digital, with MOTOTRBO's ability to operate in both analog 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.
- Utilises the **IMPRES™ Smart Energy System** to automate battery maintenance, optimise life cycle and maximise talk time.



## Static and Noise Rejection.

### The Market for Digital Conventional Two-Way Communication

Integrated, efficient, reliable communication is more critical to operational performance than ever before. Businesses and organisations whose workers must be mobile need a communication solution that makes it easy and affordable for them to stay in touch. MOTOTRBO delivers for such industries as:

- Transportation/Delivery
- Oil and Gas
- Energy and Utilities
- Local government/  
Public administration
- Manufacturing
- Private security
- Resorts
- Construction

## Your MOTOTRBO™ Opportunity

MOTOTRBO offers a private, standards-based digital conventional system that can be tailored to meet the unique coverage and feature needs of group-oriented and dispatch environments. This versatile portfolio of cost-effective products and services provides a complete system – and a complete solution. With MOTOTRBO, businesses can achieve significant productivity gains while maximising revenue.

# Why Digital Conventional Two-Way Radio

Professional digital two-way radio systems operating on licensed spectrum offer capabilities that other mobile technologies cannot. These advantages make it the clear choice for mobile organisations that require an affordable, flexible, highly reliable solution – along with the power and range available only in licensed bands.

With two-way radio, you can tailor a solution to meet your customer's specific coverage and functionality needs.

## The Digital Difference

Analog conventional two-way radio use proves itself every day in countless installations around the world. Today a new platform is available to help your customer achieve new levels of performance and productivity. Digital technology enables that breakthrough.

Many businesses need more than the fundamental services that analog conventional two-way radio can deliver. Licensed channels are becoming crowded while your customers clamor for more capacity. In combination with voice, your customers may also need access to data to improve responsiveness and productivity. Digital conventional two-way radio provides a powerful, flexible platform that can be adapted to meet these needs and more. With MOTOTRBO your customers can benefit from:

- **Expanded digital voice, data, and control capabilities** delivered over a given slice of RF spectrum. Professional customers recognize that mobile workers can be more productive if they have wireless access to applications such as Text Messaging Services and Location Services as well as voice. With digital conventional two-way radio, you can get increased capacity and flexibility to support these applications.
- **Increase calling capacity and lower equipment costs.** Digital two-way radio solutions based on Time-Division Multiple-Access (TDMA) technology enable two virtual channels within a single 12.5 kHz repeater channel. This provides twice the calling capacity for one license channel. And because there's only one "real" channel, a second call doesn't require a second repeater.
- **Clearer voice communications** over a greater range. When signal strength drops off with distance, digital error-correction technology can accurately deliver both voice and data with virtually no loss over a far greater area.
- **Static and noise rejection.** Analog signals become distorted, producing audible static as signal strength degrades. By contrast, digital receivers simply reject anything they interpret as an error. In turn, this helps to enable users to hear better in noisy environments.

- **Enhanced battery life.** Each individual transmission only uses half the battery power of an analog system transmitting at the same wattage – so MOTOTRBO portable radios deliver far more uptime per battery charge.
- **Additional functionality.** Companies that manage vehicle fleets (such as taxis or buses) or direct mobile service personnel installing or repairing equipment are looking for ways to improve customer service. Dispatchers need to be able to easily locate human and equipment assets for faster customer response. With support for integrated applications such as MOTOTRBO Location Services, they'll have just what they need.
- **Easy migration.** Many businesses can't afford to completely replace an existing infrastructure. MOTOTRBO's ability to operate in both analog and digital conventional modes enables a smooth, planned migration at your customer's pace – no sticker shock, no disruption. (Digital features are not available when operating in analog mode.)
- **Superior value.** All organisations want to get the most for their technology dollar – including a fast return on investment. With its affordable pricing and exceptional performance, the MOTOTRBO Professional Digital Two-Way Radio System is designed to be the industry's best answer – and an exceptional value.





## The MOTOTRBO™ Technology Platform

We're now at the beginning of what will quickly become a large-scale migration to digital radio in professional conventional radio applications. At the same time, regulatory pressures combined with real-world operating needs are driving radio manufacturers and users to communicate more information in a given slice of RF spectrum – in other words, to increase spectrum efficiency. Channels that historically carried a single call at a time are now being divided so they can carry two.

Two technologies exist to enable this “splitting” of channels, allowing multiple access on a single channel. Frequency-Division Multiple-Access (FDMA) splits the channel into two narrower sub-channels that can each carry separate calls. Time-Division Multiple-Access (TDMA) preserves the full channel width but divides it into alternating time slots that can each carry an individual call. 12.5 kHz FDMA is already being used around the world to accomplish the FCC-mandated split of 25 kHz channels into 12.5 kHz channels, and is currently the standard for mission-critical digital radio under Project 25 Phase 1. When it comes to further increasing efficiency within 12.5 kHz channels, Motorola believes that two-slot 12.5 kHz TDMA is the best technology for professional conventional, business-critical applications.

FDMA uses a 12.5 kHz channel in half-duplex fashion, and as a result, only one party can talk on the channel at a time. To further increase the effective capacity of an existing 12.5 kHz channel via FDMA, you would have to slice the channel into two new and very narrow 6.25 kHz sub-channels, requiring changes to licensing requirements and making it unclear how the technology will fit into and perform in today's licensed bands.

On the other hand, TDMA can be used to divide a 12.5 kHz channel into two alternating time slots. In this way, two-slot TDMA can provide 6.25 kHz equivalent efficiency in an existing 12.5 kHz channel – with no changes to licensing requirements. That means that TDMA can give your customers two-for-one channel capacity, doubling the efficiency of their licensed repeater channels.

# A Better Technology for the Conventional Two-Way Radio Users

The performance and flexibility of TDMA make it the only serious choice for professional two-way digital radio. Leveraging a TDMA platform, MOTOTRBO reduces overall equipment costs while supporting more users and more information in the same area and frequency. The spectrum efficiency gained with TDMA means that one digital repeater does the work of two analog repeaters – for greater system efficiency, and lower acquisition and operating costs.

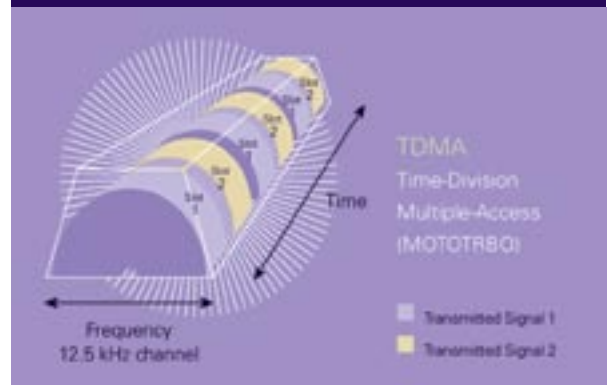
Two-Slot 12.5 kHz TDMA:

- Professional users can **decrease their spectrum congestion while doubling efficiency** of their licensed repeater channels. Two-slot TDMA allows two simultaneous conversations within a 12.5 kHz channel with a single repeater. One repeater can do the work of two – saving infrastructure acquisition, setup, and maintenance costs.
- MOTOTRBO's two-slot TDMA technology **supports both voice and data**, so customers can determine whether a given timeslot is used for voice calls or data calls in a manner that best fits their needs. While some customers may elect to use both timeslots to double the number of voice users that can be supported on the repeater channel, others may want to equip their voice users with mobile data, messaging, or location tracking capabilities: in either case, the benefits are realized within the existing repeater channel.
- 12.5 kHz TDMA fits seamlessly into existing licensed channel structures in UHF and VHF: there is **no need to obtain new licenses** to attain this increase in repeater capacity, and no added risk of interference with or from adjacent channels. The choice of 12.5 kHz TDMA digital technology makes it quick and easy to gain spectrum efficiency and improve your two-way radio communications.
- Your customers have a **future-ready, standards-based solution**. MOTOTRBO was designed to the European Telecommunications Standards Institute (ETSI) Digital Mobile Radio (DMR) Tier 2 standard, a globally recognised digital conventional radio standard for professional applications in high power, licensed bands.

## The Professional Digital Conventional Two-Way Radio System from the Industry Leader

Motorola invented the first portable two-way radio, and has more than 65 years of experience delivering wireless communications systems for government and industry. Motorola has emerged as a recognised leader in digital two-way radio technology, with proven solutions in the mission-critical, professional, and unlicensed tiers. With the introduction of MOTOTRBO, Motorola expands its digital solution range to the conventional two-way radio users, leveraging our unique depth of experience to offer your customers a new level of performance, features and value.

Increased Capacity Within Existing 12.5 kHz Repeater Channels





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