MOTOTRBO™

Professional Digital Two-Way Radio System
DP 3400/3401/3600/3601 Portable 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. (GPS location tracking).
- 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.

DP 3600/3601

Display Portable Radios

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

2 Tri-color LED indicator for clear, visible feedback of calling, scanning and monitoring.

3 Emergency button to alert supervisor or dispatcher in an emergency situation. With DP 3601, location coordinates can be sent to dispatcher using GPS.

4 New accessory connector meets IP57 submersibility specifications and incorporates RF, USB and enhanced audio capability.

5 DP 3601 includes integrated GPS module.

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

7 Radio housing meets IP57 specifications; submersible in 1 metre of water up to 30 minutes

8 Powerful, front projecting speaker.

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

10 Large, textured push-to-talk button. Provides good tactile response and easy access, even when wearing gloves.

11 160 channels.

Display Portable Radio Standard Package

- Display Portable Radio
- Antenna - Standard whip included with DP 3600; GPS Monopole included with DP 3601
- NiMH 1300 mAh Battery
- IMPRES™ Single Unit Charger
- 2.5” Belt Clip
- Quick Reference Guide

Additional Features

- Enhanced call management

  Encode/decode: emergency, remote monitor, push-to-talk ID, radio check, all call, radio disable
- Dual-mode analogue/digital scan - facilitates a smooth migration from analogue to digital
- Free-form and quick text messaging

DP 3400/3401

Non-display Portable Radios

1 Tri-color LED indicator for clear, visible feedback of calling, scanning and monitoring.

2 Emergency button to alert supervisor or dispatcher in an emergency situation. With DP 3401, location coordinates can be sent to dispatcher using GPS.

3 New accessory connector meets IP57 submersibility specifications and incorporates RF, USB and enhanced audio capability.

4 DP 3401 includes integrated GPS module.

5 Radio housing meets IP57 specifications; submersible in 1 metre of water up to 30 minutes.

6 Powerful, front projecting speaker.

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

8 Large, textured push-to-talk button. Provides good tactile response and easy access, even when wearing gloves.

9 32 channels.

Non-display Portable Radio Standard Package

- Non-display Portable Radio
- Antenna - Standard whip included with DP 3400; GPS Monopole included with DP 3401
- NiMH 1300 mAh Battery
- IMPRES™ Single Unit Charger
- 2.5” Belt Clip
- Quick Reference Guide

Additional Features

- Enhanced call management

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

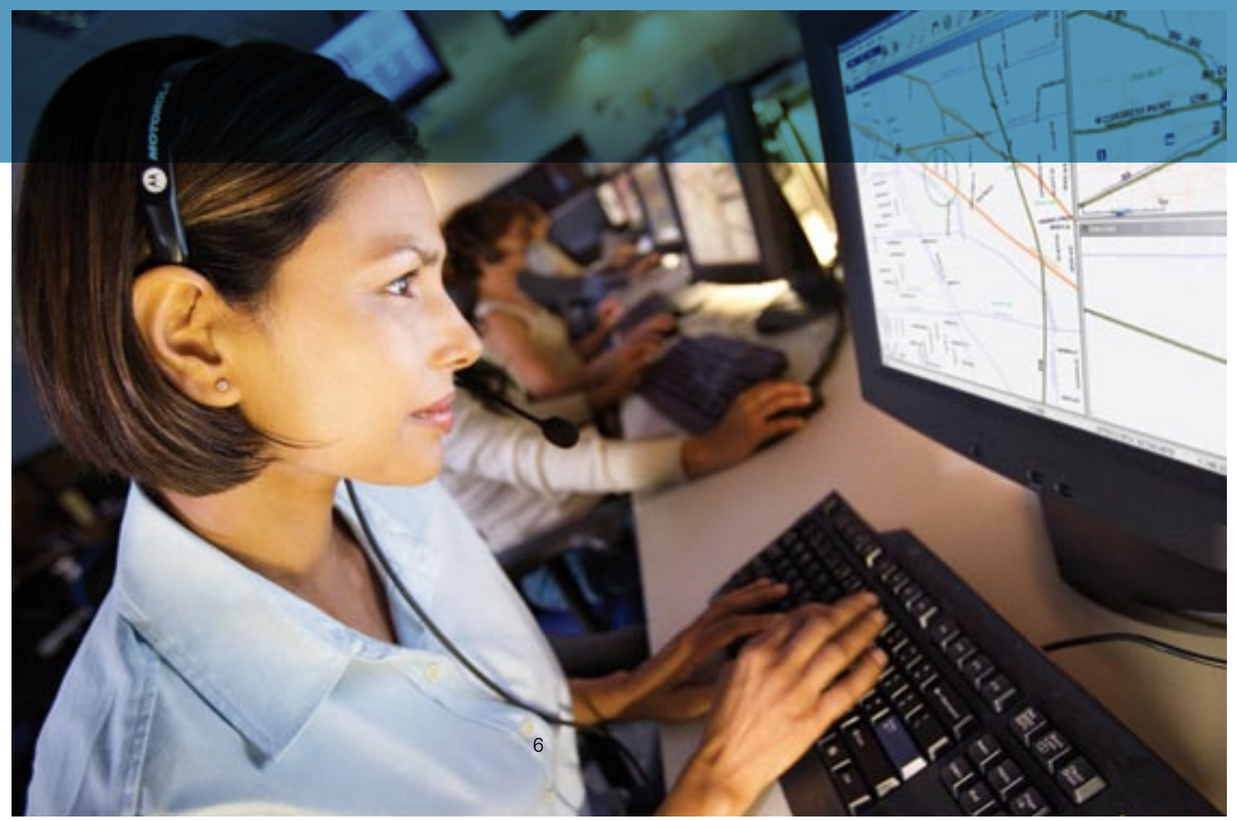
MOTOTRBO is changing the way businesses communicate. New functionality, features and well-documented interfaces embedded in the radio opens up new possibilities. Through Motorola's Application Partner Programme customers and system integrators can have access to these advanced features and build on their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

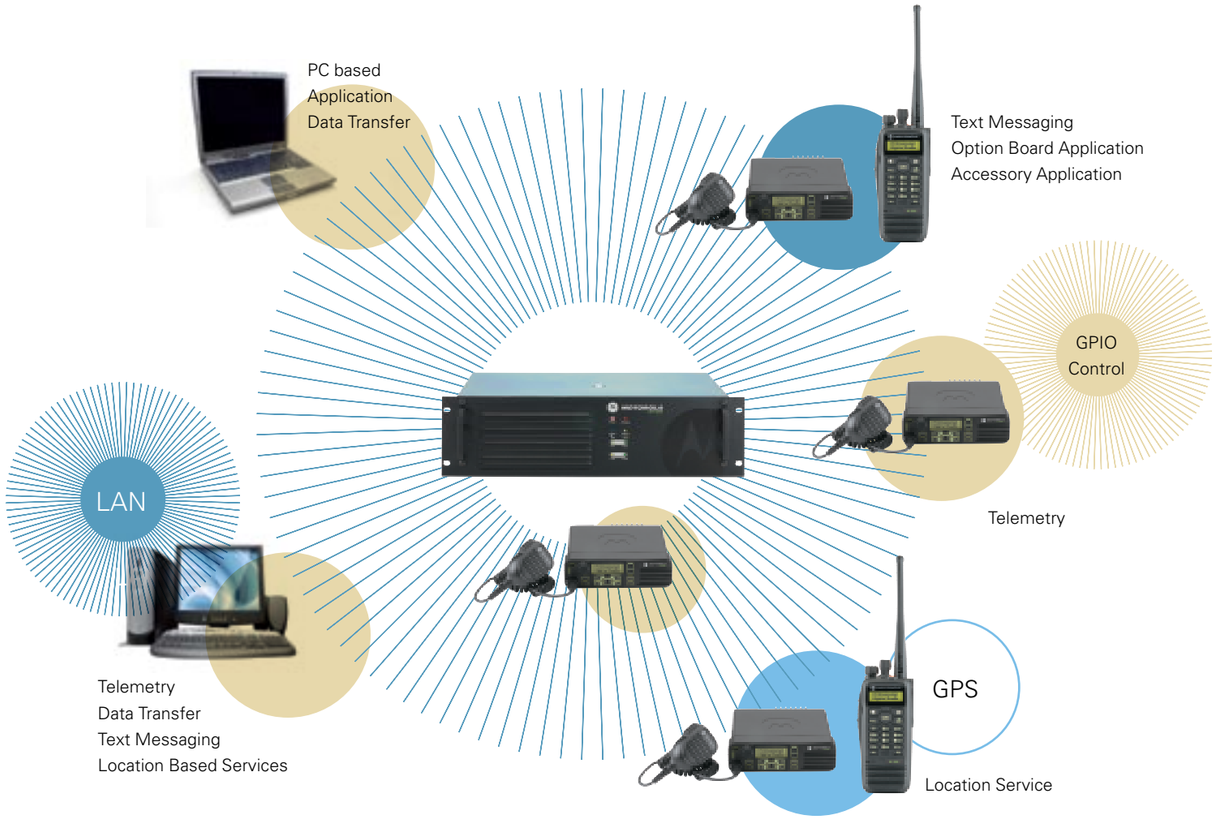
To encourage the development of a broad portfolio of customer-focused solutions and continuing innovation, MOTOTRBO is integrated in the successful running Professional Radio Application Partner Programme. Accredited partners get access to the protocol and Application Programming Interface (API) documentation 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.



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.

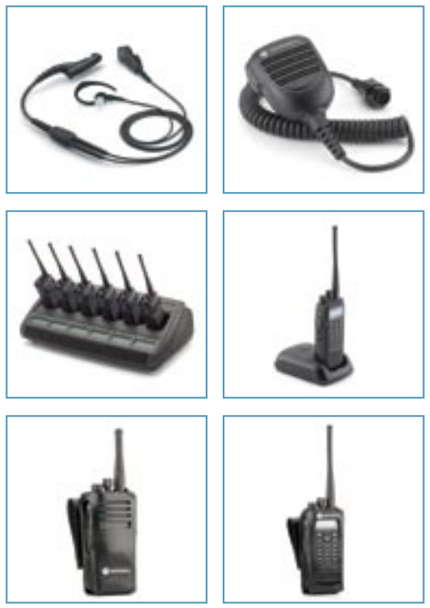
MOTOTRBO Accessories

Portable Radio

Part Number	Description
Audio	
PMMN4025	Remote Speaker Microphone with Enhanced Audio
PMMN4024	Remote Speaker Microphone
PMMN4040	Remote Speaker Microphone - Submersible (IP57)
RMN5058	Lightweight Headset
RLN5878	Receive Only Surveillance Kit, Black
RLN5879	Receive Only Surveillance Kit, Beige
RLN5880	2 Wire Surveillance Kit, Black with Enhanced Audio
RLN5881	2 Wire Surveillance Kit, Beige with Enhanced Audio
RLN5882	2 Wire Surveillance Kit with Translucent Tube, Black with Enhanced Audio
RLN5883	2 Wire Surveillance Kit with Translucent Tube, Beige with Enhanced Audio
RLN4760	Small Custom Earpiece, Right Ear, for Surveillance Kits
RLN4761	Medium Custom Earpiece, Right Ear, for Surveillance Kits
RLN4762	Large Custom Earpiece, Right Ear, for Surveillance Kits
RLN4763	Small Custom Earpiece, Left Ear, for Surveillance Kits
RLN4764	Medium Custom Earpiece Left Ear, for Surveillance Kits
RLN4765	Large Custom Earpiece, Left Ear, for Surveillance Kits
RLN5886	Surveillance Low Noise Kit
RLN5887	Surveillance Extreme Noise Kit
RLN4941	Receive Only Earpiece
AARLN4885	Receive Only Earbud
WADN4190	Over the Ear Receiver
PMLN4620	D-Shell Receive Only Earpiece
Batteries	
PMNN4066	IMPRES Li-ion 1500 mAh Submersible (IP57) Battery
PMNN4069	IMPRES Li-ion 1400 mAh Submersible (IP57) Battery - Intrinsically Safe (FM)
PMNN4065	NiMH 1300 mAh Submersible (IP57) Battery
Chargers	
WPLN4232	IMPRES Single Unit Charger
WPLN4212	IMPRES Multi Unit Charger
WPLN4219	IMPRES Multi Unit Charger with Displays

Part Number	Description
Carry Devices	
PMLN4651	2" Belt Clip
PMLN4652	2.5" Belt Clip
PMLN5015	Nylon Carry Case with 3" Fixed Belt Loop for Display Radio
PMLN5021	Hard Leather Carry Case with 3" Fixed Belt Loop for Display Radio
PMLN5019	Hard Leather Carry Case with 2.5" Swivel Belt Loop for Display Radio
PMLN5020	Hard Leather Carry Case with 3" Swivel Belt Loop for Display Radio
PMLN5024	Nylon Carry Case with 3" Fixed Belt Loop for Non-Display Radio
PMLN5030	Hard Leather Carry Case with 3" Fixed Belt Loop for Non-Display Radio
PMLN5028	Hard Leather Carry Case with 2.5" Swivel Belt Loop for Non-Display Radio
PMLN5029	Hard Leather Carry Case with 3" Swivel Belt Loop for Non-Display Radio
PMLN5022	2.5" Replacement Swivel Belt Loop
PMLN5023	3" Replacement Swivel Belt Loop
HLN6602	Universal Chest Pack
RLN4570	Break-A-Way Chest Pack
1505596Z02	Replacement Strap for RLN4570 and HLN6602 Chest Packs
RLN4815	Universal RadioPAK and Utility Case (fanny pack)
4280384F89	Universal RadioPAK Extension Belt
NTN5243	Shoulder Strap (attaches to D-rings on carry case)
HLN9985	Waterproof bag, includes large carry strap
RLN4295	Small Clip, Epaulet Strap
4200865599	Belt
Antennas	
PMAE4018	Combination GPS / UHF 403-433 MHz Folded Monopole Antenna
PMAE4024	Combination GPS / UHF 430-470 MHz Folded Monopole Antenna
PMAE4021	Combination GPS / UHF 403-433 MHz Stubby Antenna
PMAE4023	Combination GPS / UHF 430-470 MHz Stubby Antenna
PMAE4022	UHF 403-470 MHz Whip Antenna

The MOTOTRBO radio portfolio is supported by a range of genuine Motorola accessories to enhance functionality and ensure the highest performance of the radio solution. Whether it is harsh working conditions, noisy environments, long shifts or the focus is on discrete communication, the MOTOTRBO accessories range will meet the need. The versatile range of accessories allows users to focus on the job at hand whether that is ensuring the safety of people or equipment, maintaining production efficiency or moving goods or people. All accessories are engineered and tested to the same demanding standards as the radios. They are designed with the user in mind and the ergonomic and easy to use accessories helps ensure the team keeps in contact.



Audio Solutions

Remote- and Public Speaker Microphones are versatile and reliable accessories allowing users to remain in full contact without removing the radio from its position at the belt, in a case or a charger. The range of Speaker Microphones offered with MOTOTRBO utilises different technologies to offer enhanced background reduction, reduced water intrusion and enhanced coverage along with earjack and programmable buttons.

A versatile range of audio accessories ensures that users have full advantage of the services offered by MOTOTRBO. Tailored solutions ensure efficiency for safety organisations, covert, commercial and industrial users.

Battery and Charging Solutions

The power to communicate is vital and requires efficient battery and charging solutions. MOTOTRBO offers different types of battery solutions depending on customer requirements.

Carrying solutions

The ability to perform the job while staying in contact requires good carrying solutions. MOTOTRBO offers a wide range of solutions including belt clips, nylon- and leather carry cases, shoulder straps and chest packs. All designed to optimise user performance and enhance functionality such as ruggedness as well as water and dust resistance.

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.

MOTOTRBO Portable Radio Specifications

DP 3600/3601 Display Portable Radios

Specifications

GENERAL SPECIFICATIONS

Channel Capacity	160
Frequency	403-470 MHz
Dimensions (HxWxL)	
with NiMH Battery 1300mAH	131.5 x 63.5 x 37.2 mm
with Lilon Std Battery 1500mAH	131.5 x 63.5 x 35.2 mm
with Lilon FM Battery 1400mAH	131.5 x 63.5 x 37.2 mm
Weight	
with NiMH Battery	430 g
with Lilon FM Battery	370 g
with Lilon Std Battery	360 g
Power Supply	7.2V nominal
Average battery life at 5/5/90 duty cycle with battery saver enabled in carrier squelch and transmitter in high power.	
IMPRES LiIon Std Battery	Analogue: 9 hrs / Digital: 13 hrs
IMPRES FM LiIon Battery	Analogue: 8.5 hrs / Digital: 12 hrs
NiMH Battery	Analogue: 8 hrs / Digital: 11 hrs

RECEIVER

Frequency	403-470 MHz
Channel Spacing	12.5 kHz/ 25 kHz
Frequency Stability	+/- 1.5 ppm (DP 3600)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DP 3601)
Analogue Sensitivity	0.35 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	65 dB
Adjacent Channel Selectivity	60 dB @ 12.5 kHz,
	70 dB @ 25 kHz
Spurious Rejection	70 dB
Rated Audio	500 mW
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 (DP 3600)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DP 3601)
Power Output	
Low Power	1 W
High Power	4 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
	-30dBm > 1GHz
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 Intrusion	EN60529 - IP57
Packaging Test	MIL-STD 810D and E

* With Lilon battery, operating temperature specification is -10° C / +60° C.

With NiMH battery, operating temperature specification is -20° C / +60° C

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

FACTORY MUTUAL APPROVALS - DP family of radios are certified by Factory Mutual Approvals as intrinsically safe for use in Division 1, Class I,II,III, Groups C,D,E,F,G, when ordered with the Factory Mutual approved battery option.

DP 3400/3401 Non-display Portable Radios

Specifications

GENERAL SPECIFICATIONS

Channel Capacity	32
Frequency	403-470 MHz
Dimensions (HxWxL)	
with NiMH Battery 1300mAH	131.5 x 63.5 x 37.2 mm
with Lilon Std Battery 1500mAH	131.5 x 63.5 x 35.2 mm
with Lilon FM Battery 1400mAH	131.5 x 63.5 x 37.2 mm
Weight	
with NiMH Battery	400 g
with Lilon FM Battery	340 g
with Lilon Std Battery	330 g
Power Supply	7.2V nominal
Average battery life at 5/5/90 duty cycle with battery saver enabled in carrier squelch and transmitter in high power.	
IMPRES LiIon Std Battery	Analogue: 9 hrs / Digital: 13 hrs
IMPRES FM LiIon Battery	Analogue: 8.5 hrs / Digital: 12 hrs
NiMH Battery	Analogue: 8 hrs / Digital: 11 hrs

RECEIVER

Frequency	403-470 MHz
Channel Spacing	12.5 kHz/ 25 kHz
Frequency Stability	+/- 1.5 ppm (DP 3400)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DP 3401)
Analogue Sensitivity	0.35 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	65 dB
Adjacent Channel Selectivity	60 dB @ 12.5 kHz,
	70 dB @ 25 kHz
Spurious Rejection	70 dB
Rated Audio	500 mW
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 (DP 3400)
(-30° C, +60° C, +25° C)	+/- 0.5 ppm (DP 3401)
Power Output	
Low Power	1 W
High Power	4 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
	-30dBm > 1GHz
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 Intrusion	EN60529 - IP57
Packaging Test	MIL-STD 810D and E

* With Lilon battery, operating temperature specification is -10° C / +60° C.

With NiMH battery, operating temperature specification is -20° C / +60° C

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

FACTORY MUTUAL APPROVALS - DP family of radios are certified by Factory Mutual Approvals as intrinsically safe for use in Division 1, Class I,II,III, Groups C,D,E,F,G, when ordered with the Factory Mutual approved battery option.

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MD-TRBO/PORTABLEBROCH