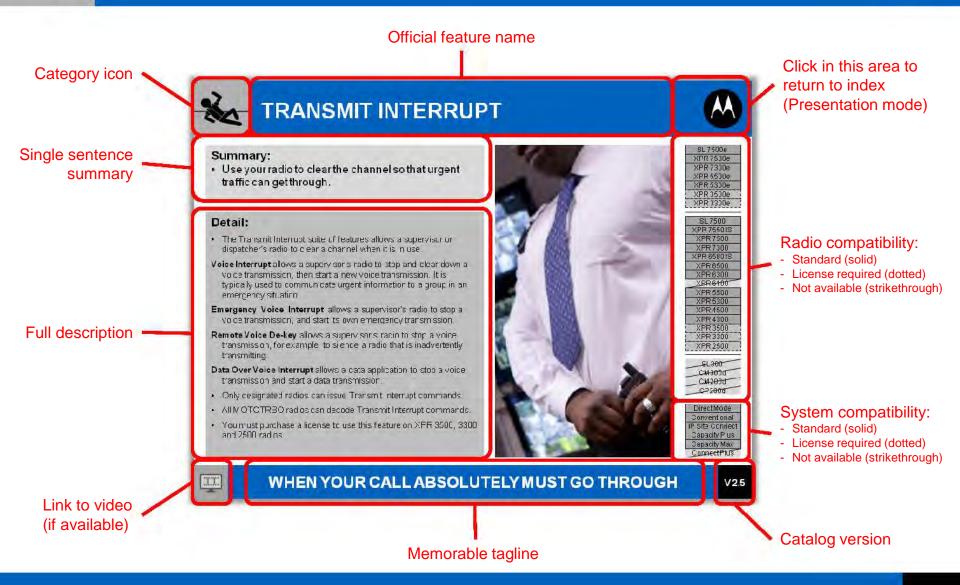


# MOTOTRBO FEATURE CATALOG

VERSION 2.51 2-MAR-2016

## **HOW TO USE THIS CATALOG**







## **CATEGORIES**





**AUDIO** 



**EFFICIENCY AND PRODUCTIVITY** 



**SAFETY AND SECURITY** 



CONNECTIVITY



**SYSTEMS** 

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## **AUDIO**

SINC+ Noise Cancellation



### **EFFICIENCY AND PRODUCTIVITY**

Intelligent Audio	Dual Capacity Direct Mode	Scan	Hospitality Work Order Ticketing
IMPRES™ Audio	High Efficiency GPS	Priority Monitor Scan	Event-Driven Location Update
Windporting	Fast GPS	Home Channel Reminder	Screen Backlight Configuration
Acoustic Feedback Suppressor	Voice Announcement	Text Messaging	Multi-Button PTT
Automatic Gain Control (AGC)	Text to Speech	Radio Management	Low Voltage Battery Technology
Microphone Distortion Control	Voice Operated Transmission (VOX)	Over-The-Air Programming (OTAP)	
Switch Speaker	Programmable Buttons	Wi-Fi Software Updates	
User-Selectable Audio Profiles	IMPRES™ Energy	IMPRES™ Battery Management	
Trill Enhancement	Option Board	IMPRES™ OTA Battery Management	
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## **SAFETY AND SECURITY**



## **CONNECTIVITY**



## **SYSTEMS**

Restricted Access to System

**Enhanced Privacy** 

Bluetooth Audio

Direct Mode / Talkaround

Transmit Interrupt

IP Rating

Bluetooth Data

Single Site Conventional

Digital Emergency

Hazardous Location Certification

Telemetry

**IP Site Connect** 

**Emergency Search Tone** 

HazLoc Battery Mismatch Alert

Pre-Configured Telephone Patch

Capacity Plus (Single-Site and Multi-Site)

Remote Monitor

Indoor Location-Tracking

Integrated Wi-Fi

Capacity Max

Radio Disable / Enable

Man Down

Lone Worker

Basic Privacy

Connect Plus

Digital Voting

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# **INTELLIGENT AUDIO**

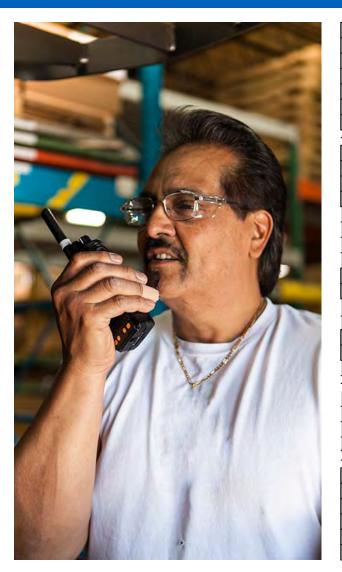


### **Summary:**

 Your radio monitors background noise and adjusts the speaker volume, so you don't have to.

### **Detail:**

- Intelligent Audio is a receive-only feature that enhances the audibility of voice calls.
- It uses the radio or accessory's microphone to monitor levels of background noise. When it detects that the radio is in a loud environment, the speaker volume is automatically increased. When in a quiet environment, the volume is automatically reduced.
- The radio's volume can still be adjusted using the volume knob, but this feature eliminates the need for continual adjustment.
- Accessories are not required, but selected accessories are supported.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 750
XPR 7550
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XPR 730
XPR-6580
XPR-650
XPR 630
XPR 610
XPR 550
XPR 530
XPR-450
XPR 430

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XPR 3500

XPR 3300 XPR 2500



## IMPRES™ AUDIO

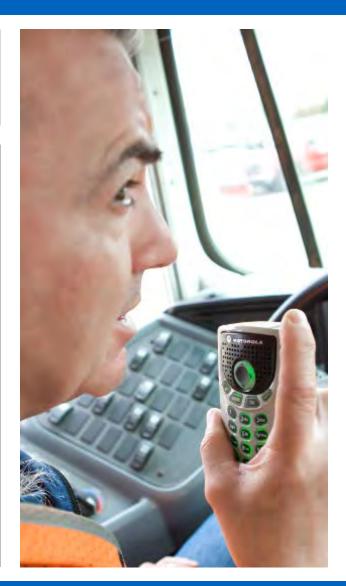


### **Summary:**

 Your radio works seamlessly with your accessories to ensure that every call is heard perfectly.

### **Detail:**

- Your MOTOTRBO radio contains a digital signal processor (DSP)
  that fine-tunes the audio signal from the microphone, enhancing
  clarity and reducing background noise. IMPRES™ audio
  accessories communicate their own unique set of audio parameters
  to the radio's DSP, to further optimize the audio processing.
- IMPRES technology also optimizes Automatic Gain Control (AGC) to compensate for variability of input level. Maybe some of your users don't speak directly into the microphone while they are operating machinery; maybe some others have to shout over heavy background noise, maybe others work in an environment that requires them to speak quietly. The IMPRES audio AGC optimizes the signal level so all these users are heard at a similar volume.
- A compatible IMPRES audio accessory is required.



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# WINDPORTING



### **Summary:**

 Your RSM minimizes wind noise, so you can communicate clearly in difficult weather.

### **Detail:**

- Wherever you work in howling wind, driving rain, and severe weather – Windporting helps you communicate effectively and helps listeners hear clearly.
- Windporting technology eliminates the booming and howling sounds of wind blowing across your lapel microphone or remote speaker microphone. It also prevents water from clogging the microphone for clearer transmissions.
- Windporting is only available on selected accessories.



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XPR 3500

XPR 3300 XPR 2500



## **ACOUSTIC FEEDBACK SUPPRESSOR**



### **Summary:**

 Your radio blocks acoustic feedback from other radios to eliminate unpleasant "howling".

### **Detail:**

- Audio Feedback Suppressor is a receive-only feature that improves the overall ability to communicate in the presence of acoustic feedback.
- If you've ever been near to a colleague when making a group call, you're familiar with the acoustic feedback that can result: the audio coming out of the speaker feeds back into the microphone until nobody can hear anything except an unpleasant "howling" noise.
- The latest MOTOTRBO software alleviates this irritating problem.
   Using a sophisticated software algorithm, your radio is able to
   recognize the audio feedback from nearby radios and discard it.
   Now you never need to step away from your colleagues to make a
   call. And you can trust that your radio will allow your clients to enjoy
   their peace and quiet.
- This feature was introduced in software release 2.2A.



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SL300 CM300d CM200d CP200d

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XPR 3300

XPR-2500



## **AUTOMATIC GAIN CONTROL (AGC)**

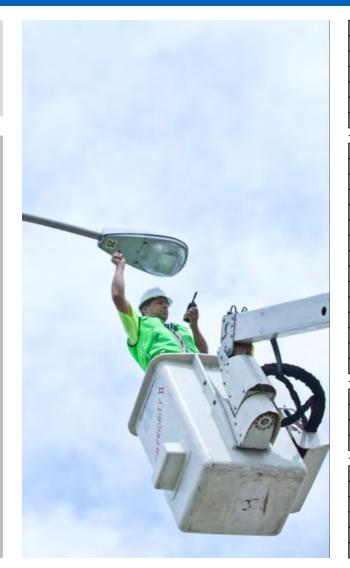


### **Summary:**

 Everyone can be heard clearly, whether they whisper or shout into the microphone.

### **Detail:**

- The DMR vocoder delivers excellent voice quality even when there is high background noise and poor signal conditions but to produce optimal voice quality, the input level into the vocoder must fall within a specific range: This is difficult, as each user has their own individual style: some hold the microphone close to their mouth; some speak loudly over background machinery, and some use a visor microphone or RSM that doesn't even face their mouth.
- To address this, MOTOTRBO digital employs Automatic Gain Control (AGC) in the audio transmit path. Its primary function is to produce the best voice quality possible under real life conditions. IMPRES audio builds on this technology to deliver optimal voice quality over an even greater input range.
- A secondary function of AGC is to produce uniform speech loudness at the receiving radio: soft talkers, shouters and users who turn away from the microphone will still come through loud and clear.



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CM200d	
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## **MICROPHONE DISTORTION CONTROL**

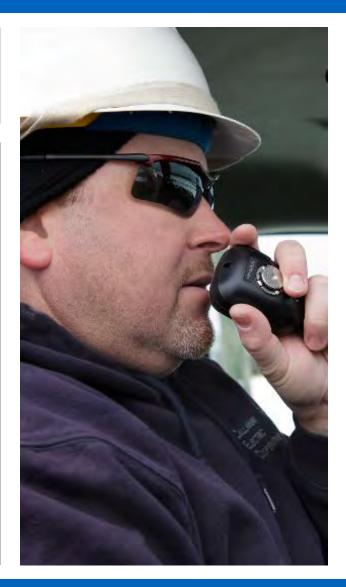


### **Summary:**

 Your radio adjusts its microphone to match your voice, so your call is never distorted.

### **Detail:**

- This is a transmit-only feature. It improves voice quality when the user is speaking loudly into the microphone, and works alongside the standard AGC (Automatic Gain Control) of the radio.
- The radio continuously monitors the quality of the speech data as it
  is being processed. When it detects early signs of audio distortion,
  perhaps by someone speaking loudly over background noise, the
  radio reduces the sensitivity of the microphone until the distortion
  disappears.
- Microphone Distortion Control is a natural extension of the Automatic Gain Control (AGC) feature, as it monitors and controls distortion of the transmit audio.
- This feature was introduced in software release 2.2A.



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XPR-3300e

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XPR-61
XPR 55
XPR 53
XPR 45
XPR 43

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## **SWITCH SPEAKER**



### **Summary:**

 You can switch audio from your headset to your radio's speaker without unplugging.

### **Detail:**

- This feature allows you to direct the audio stream to either an attached accessory or to the radio speaker, without the need to detach the accessory.
- In some situations, you need to wear an earpiece or headset in the office, but take it off when you head outside.
- Previously, the radio's internal speaker would be muted whenever an audio accessory was attached to the radio.
- Now, with the Toggle Audio feature, you can send the audio in either direction without disconnecting the headset or earpiece. The feature is activated through the radio menu or by pressing a preprogrammed button.
- This feature was introduced in software release 2.4.



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XPR 2500



# **USER-SELECTABLE AUDIO PROFILES**



### **Summary:**

 Your radio's audio characteristics can be tuned to suit your preference and your workplace.

### **Detail:**

- Everyone's hearing is different. Depending on age and work history, you may have reduced sensitivity to certain frequencies. It doesn't help when your work environment has variable background noise.
- This feature allows you to customize the audio of the radio to suit your preference and work environment. You can select from two different "ambience" settings and six different audio profiles.

### Ambience profiles:

- o Default
- o Loud: For loud environments: increases volume and noise suppression
- o Work Group: For quiet environments: enables feedback suppression

### Audio Profiles:

- o Default
- o Level 1: Mild compensation, for users exposed to industrial noise
- o Level 2: Moderate compensation, for users exposed to industrial noise
- o Level 3: Maximum compensation, for users exposed to industrial noise
- o Treble Boost: For a "brighter" sound
- o Mid Boost: For a more "nasal" tone similar to legacy radios
- o Bass Boost: For a deeper sound
- This feature was introduced in software release 2.4.



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XPR-658	<del>30</del> 15
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XPR 6	100
XPR 5	500
XPR 5	300
XPR 4	500
XPR 4	300

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# TRILL ENHANCEMENT

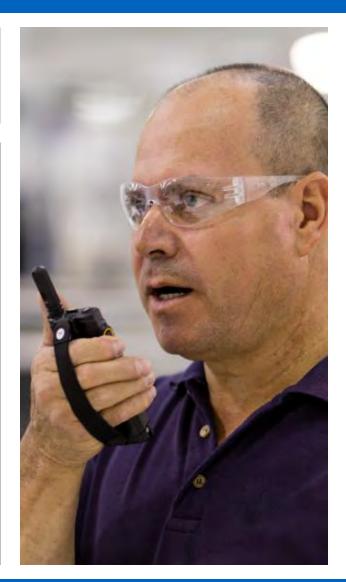


### **Summary:**

 Your radio reproduces more languages with better accuracy.

### **Detail:**

- The AMBE+2™ vocoder (AMBE = Advanced Multi-Band Exciter) is the industry standard algorithm for converting speech into a narrowband digital data stream. It recognises the sounds made by the human voice and renders them as a set of highly-optimised codes. It allows digital radio to be extremely efficient, and as a side benefit, it helps remove some of the background noise from transmissions.
- However, the algorithm does not reproduce some languages very well. In particular, the "trill" or rolling "rrrr" sound in the Latin languages is transformed into a flattened "r".
- This feature applies additional audio processing in the transmitting radio to enhance the sharpness of the trill. In this way, speech is more intelligible, but there is minimal impact to the way voice is transmitted: Non-MOTOTRBO radios in the system will receive the benefit of the enhanced transmissions however they will not be able to respond with a similar level of audio clarity.
- This feature was first introduced in software release 2.4.



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CP200d	

XPR 2500





# **SINC+ NOISE CANCELLATION**



### **Summary:**

 Your radio gives you more options to filter out background noise, so you're heard more clearly.

### **Detail:**

- All MOTOTRBO radios have basic noise cancellation, which provides effective suppression of background noise in a wide range of user environments.
- SINC+ (enhanced Single-input Industrial Noise Cancellation) provides two new configurations: "Enhanced" and "Enhanced Auto".
  - "Enhanced" applies exceptionally effective suppression of background noise for environments that are consistently noisy.
  - "Enhanced Auto" adapts the amount of suppression based on the
    volume of ambient noise detected, and is ideally suited for users who
    move between quiet and loud environments. In a noisy situation, the
    maximum noise suppression is applied. In a quiet situation, only a little
    noise suppression is applied, and maximum speech detail is retained.
- SINC+ is very affordable, although not quite as effective as dedicated dual-microphone noise-cancellation accessories.
- This feature was introduced in software release 2.5. For each radio, you must purchase a license (HKVN4373) to use the feature.



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## **DUAL CAPACITY DIRECT MODE**



### **Summary:**

 Unlock the full capacity of DMR without a repeater, to double your channel capacity at no extra cost.

### **Detail:**

- To allow both timeslots of a 12.5kHz DMR channel to carry simultaneous and independent traffic, you usually need a repeater (to provide the timing reference). But MOTOTRBO radios are able to synchronize automatically and collaboratively, eliminating the requirement for a central reference.
- This allows you to use both timeslots, doubling capacity and increasing spectrum efficiency without the cost of a repeater and its associated infrastructure.
- This feature was introduced in software release 2.1.



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CM300d	
CM200d	
CP200d	

XPR 2500





## HIGH EFFICIENCY GPS



### **Summary:**

 Increase the precision, capacity and reliability of your GPS solution without adding more channels.

### **Detail:**

- This feature reduces the size of MOTOTRBO GPS location update messages, increasing the effective GPS capacity of the system.
   When used with a control station console, capacity increases by 200-350%; and with a wireline console by 200-700%. You can use the additional capacity in one or more of these ways:
  - 1) Increase the precision of the location information, by increasing the GPS location update rate (max 1 every 7.5s).
  - 2) Increase the number of GPS users without using extra channels.
  - 3) Increase reliability by reducing the message collision rate.
- This feature was introduced in software release 2.3.



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XPR 4500

XPR 4300 XPR 3500

XPR 3300

Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max
Connoctation





# **FAST GPS (CONNECT PLUS)**



### **Summary:**

 Increase the efficiency and speed of GPS updates in your MOTOTRBO Connect Plus system.

### **Detail:**

- This feature allows you to provision dedicated "Fast GPS Report Channels": up to 28 channels per site.
- When radios register at the site, they are allocated a particular timeslot on a particular channel to provide their GPS location updates.
- This reduces load on the control channel and increases speed and reliability.
- · Updates can be scheduled for
  - Every 30 seconds (1 report every frame, 16 per superframe)
  - Every 1 minute (1 report every 2 frames, 8 per superframe)
  - Every 2 minutes (1 report every 4 frames, 4 per superframe)
  - Every 4 minutes (1 report every 8 frames, 2 per superframe)
  - Every 8 minutes (1 report every 16 frames, 1 per superframe)
- This feature was introduced in Connect Plus software release 1.6.
   For each GPS slot on the system, you must purchase a license (HKVN4290) to use the feature. Licenses are registered and activated on the Site Controller.



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SL-7500

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SL300 CM300d CM200d CP200d





## **VOICE ANNOUNCEMENT**

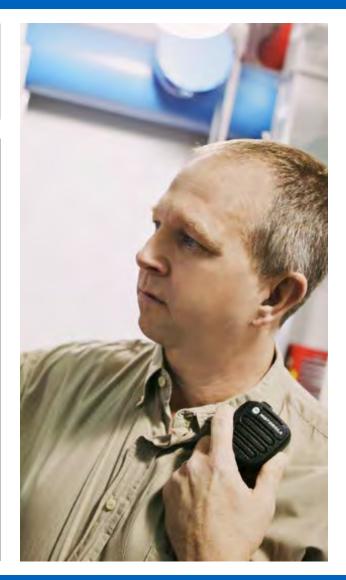


### **Summary:**

 Your radio can be programmed to confirm actions or alerts with an audio prompt.

### **Detail:**

- When you're working in limited visibility, or when you need to keep your eyes on the job, or when you just need 100% confidence you've hit the right button, voice announcement can help.
- The feature allows you to associate a pre-recorded audio clip with a radio function. So when you switch channels, your radio will announce the name of the new channel. When you transition between zones, your radio will let you know. And if you need to use programmable buttons without looking at them, your radio can confirm that you hit the right key.
- A large selection of audio files is provided by Motorola, but you can also record your own. Files and associations are managed through the CPS software.



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XPR 3300 XPR 2500



# **TEXT TO SPEECH**

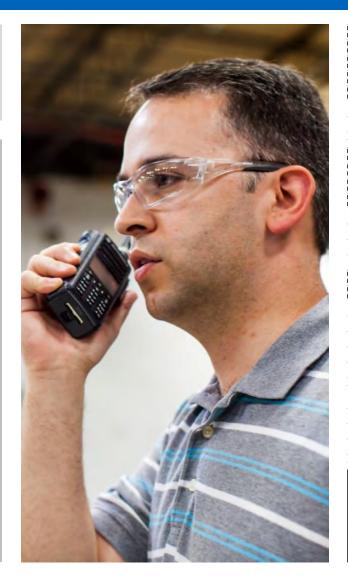


### **Summary:**

 Your radio can now read text out loud: channels, zones, functions, messages and work order tickets.

### **Detail:**

- This feature is an add-on to <u>voice announcement</u>. It removes the
  dependency on pre-recorded voice announcement files by installing
  speech synthesis software on the radio itself. Channel names,
  zones, programmable button functions, text messages and work
  order tickets are all read out loud to you.
- You can define a custom dictionary to ensure accurate readout of abbreviations and industry specific terminology, and choose from 27 different languages and several different voices.
- Programmable buttons can be configured to:
  - · Turn the feature on and off.
  - · Repeat the last announcement.
- All parameters are configurable using the CPS.
- This feature was introduced in software release 2.4. For each radio, you must purchase a license (HKVN4281) to use the feature.



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XPR-2500



# **VOICE OPERATED TRANSMISSION (VOX)**



### **Summary:**

 Voice activation allows your radio to be completely hands-free.

### **Detail:**

- This feature allows your radio to start transmitting automatically as soon as it hears your voice. This is especially useful when you are operating machinery or driving a vehicle.
- The feature is designed to work with specific accessories that position the microphone close to your mouth.
- You should be aware that VOX will be activated by any voice, so if you are working in close proximity to another person, you may experience some inadvertent transmissions.
- If your radio is operating in a mode that delivers a Talk Permit Tone (TPT), you should start with a "trigger" word, then wait for the Talk Permit Tone before you speak.
- VOX is suspended whenever you press the PTT button on your radio, and can be resumed by pressing a pre-programmed button, changing the channel, or power-cycling the radio.



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XPR 3500
XPR 3300
XPR 2500









## **PROGRAMMABLE BUTTONS**



### **Summary:**

 You can personalize your radio to access functions with one touch

### **Detail:**

- Because MOTOTRBO radios have so many features and functions, it's sometimes useful to program quick access shortcut keys.
- Every MOTOTRBO radio has programmable buttons, and a wide range of different functions can be assigned to them through the CPS.
- More advanced radios have a dedicated (and recessed) orange emergency button, but the emergency function can be assigned to any programmable button on any radio that supports digital emergency.
- The SL300 programmable button can scroll through several different functions.







### **Available Functions**

- All Alert Tones On/Off
- Backlight Intensity (Mobile)
- Backlight Auto On/Off (Portable)
  - Battery Indicator (Portable)
    - Bluetooth Connect
    - Bluetooth Disconnect
- Bluetooth Discoverable On/Off
- · Bluetooth Headset Audio Switch
  - Brightness
  - Call Alert
  - Call Forwarding Set/Clear
    - Call Log Access
  - Channel Announcement
  - Channel Down (Mobile)
  - Channel Up (Mobile)Contacts
  - Day/Night Display Toggle
    - Emergency Off
    - Emergency On
  - Ext PA On/Off (Mobile)
    - GPS On/Off
    - High/Low Power
- Horn & Lights On/Off (Mobile)
  - Intelligent Audio On/Off
  - Keypad Lock (Portable)
    - Man Down
  - Manual Dial For PrivateManual Site Roam
    - Message
- Microphone AGC On/Off
  - Monitor (Portable)
  - Nuisance Delete
- One Touch Access 1-6
- Option Board Feature 1- 6
  - PA On/Off (Mobile)

- · Permanent Monitor
  - Phone Call
  - Phone Exit
- Phone Manual Dial
  - · Privacy On/Off
  - Radio Check
  - Radio Disable
  - Radio Enable
  - Radio Name
- Radio/Accessory Speaker (Portable)
  - · Remote Monitor
- · Repeat last voice announcement
  - Repeater Access #1, #2
  - Repeater/Talkaround
    - Scan On/Off
    - Site Alias
    - Site Lock On/Off
      - Status
  - Telemetry Button 1-3
    - Text Message
  - Tight/Normal Squelch
- Toggle AF Suppressor (Portable)Toggle External PA On/Off
  - (Mobile)

     Toggle Internal PA On/Off
  - (Mobile)
  - Toggle PA for Voice Announcement (Mobile)
  - TX Interrupt Remote De-key
    - Unassigned
  - Voice Announcement On/Off
    - Volume Set Tone
      - VOX On/Off
      - Zone Selection
      - Zone Toggle

2	1	SL 7500e
5	1	XPR 7500e
3	1	XPR 7300e
4	(1)	XPR 5500e
4	0	XPR 5300e
4	0	XPR 3500e
2	0	XPR 3300e

2	1	SL 7500
	1	XPR 7550 IS
	1	XPR 7500
3	1	XPR 7300
	1	XPR 6580 IS
	1	XPR 6500
3	1	XPR 6300
3	0	XPR 6100
	(1)	XPR 5500
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	0	XPR 4500
2	0	XPR 4300
	0	XPR 3500
2	0	XPR 3300
	0	XPR 2500

(1)	0	SL300
4	0	CM300d
2	0	CM200d
2	0	CP200d





## **IMPRES™ ENERGY**



### **Summary:**

 IMPRES technology gives you the most from your battery investment.

### **Detail:**

- · With manufacturing tolerances, age, history, environmental conditions and general usage, the capacity of a rechargeable battery will vary significantly from its rated value. If you use an ordinary battery, you will encounter situations where it dies unexpectedly; sometimes prematurely; and always at the worst possible moment.
- IMPRES radios, batteries and chargers are different. They have additional built-in circuitry that monitors the exact state of the battery cells. You will get early notification of a battery nearing the end of its life, and can plan replacement accordingly. What's more, you'll never need to throw away a perfectly good battery based only on its age, or keep extra spare batteries "just in case".
- IMPRES chargers sense when a battery needs reconditioning, and automatically schedule a deep discharge and recharge cycle to maximise the life of the cells. The lifetime of IMPRES batteries is on average 40% longer than ordinary batteries.



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XPR 3300

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_CM300d
_CM200d
_CP200d

XPR 2500







## **OPTION BOARD**

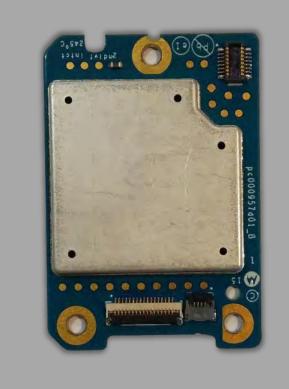


### **Summary:**

 An extra internal processor for your radio, allowing developers to customize your radio's functionality.

### **Detail:**

- MOTOTRBO radios have an internal physical interface to accommodate an option board with its own onboard processor and software. The option board can interoperate with the radio to create a custom end-user feature or solution, which can be as simple as Man Down, or as complex as Connect Plus trunking.
- The option board has access to the radio inputs (for example button presses and system signals), and can instruct the radio to perform certain actions (for example display text or re-route audio). It can also activate or de-activate specific functions such as Scan or Text Messaging.
- The option board also allows the radio to communicate with other devices within the radio system, such as a server hosting a database.



SL 7500e XPR 7500e XPR 7300e XPR 5500e XPR 5300e XPR 3500e XPR 3300e

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XPR-2500



## **SCAN**



### **Summary:**

 You can program your radio to listen out for calls across your whole team.

### Detail:

- This feature instructs a radio to listen for activity on several channels and/or talkgroups, as defined by a **Scan List**. When the radio detects a call in progress on one of these channels or talkgroups, it pauses the scan and plays the transmission. If "talkback" is configured, the user can then push the PTT button and reply to that channel / talkgroup.
- The scanning of multiple talkgroups on the same channel is called Group Scan. It's simple and ideal for small, simple systems.
   Because only one call takes place on a channel at any given time, the scanning radio will never miss a transmission.
- The scanning of multiple channels is called Channel Scan. It is more flexible and the Scan List can even include analog channels, but you may miss calls, as the radio cannot tune to multiple frequencies / technologies at the same time. It is therefore recommended that the Scan List is kept as short as possible.
- The Scan List can contain one Priority-1 and one Priority-2 channel; all others are considered Non-Priority. Higher priority channels are scanned more frequently. During playback, the radio will continue to scan higher priority channels periodically, producing short "audio holes" while the radio re-tunes.



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SL 7500

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CM200d	
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## **PRIORITY MONITOR SCAN**

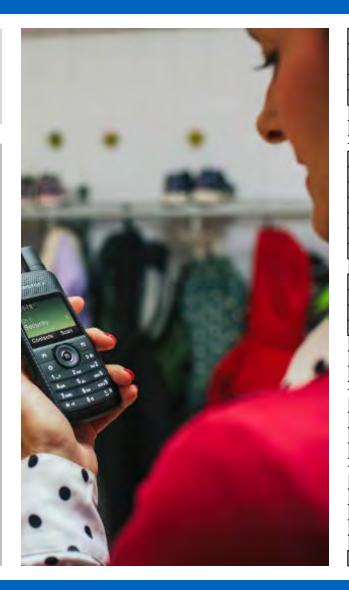


### **Summary:**

 Your Connect Plus radio will interrupt your call when a higher priority calls starts.

### **Detail:**

- This feature allows you to manage calls according to their priority in a busy environment.
- When the system is set up, talkgroups can be assigned priority levels (1 or 2).
- Calls are initiated on these talkgroups in the normal way. Idle radios will be listening on the control channel, and will join if they are members of the talkgroup.
- However, radios participating in other calls will be on trunked channels, would not hear the call announcement on the control channel, and so would not know that the priority call has started.
- Priority Monitor Scan therefore announces the priority call to all radios in calls. Announcements are made 4x per second (2x per second if the repeater is also hosting the control channel).
- If the new priority call is relevant to them, radios will leave the call in progress, and make a Late Entry to the priority call.
- Radios will not leave Emergency, Multi-Group, Private or Site All Calls.
- The feature was introduced in Connect Plus release 1.6



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# **HOME CHANNEL REMINDER**

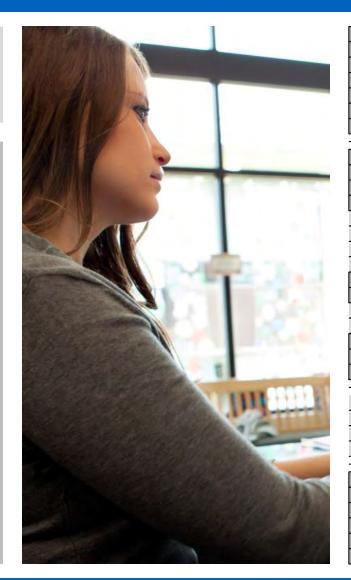


### **Summary:**

 Your radio reminds you when you're away from your regular channel.

### **Detail:**

- When a user primarily uses just one channel, you can program the radio to set that as the "Home Channel".
- This is particularly useful for inexperienced workers: they can stay on the same channel except when a special situation arises.
- If the user changes the channel either deliberately or by accident, and does not return within a time limit, the radio can be configured to sound a "reminder".
- The reminder can be a pre-programmed voice announcement or a text-to-speech programmed prompt.
- This feature is configured through the CPS software.
- This feature was introduced in software release 2.4A.



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_CM300d
_CM200d
_CP200d

XPR 3300

XPR 2500

Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max
Connect Plus





## **TEXT MESSAGING**

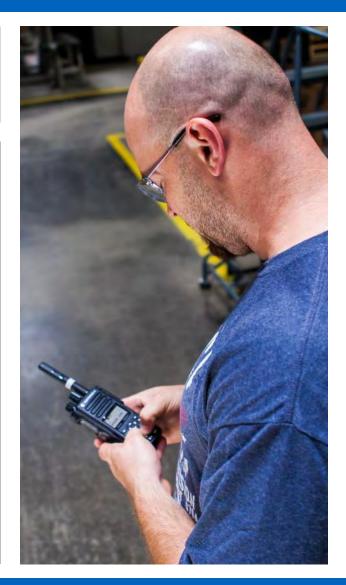


### **Summary:**

 Connect with your colleagues even when it's not appropriate to talk.

### **Detail:**

- MOTOTRBO has a built-in text messaging service that can be expanded for even greater capability.
- Using the built-in text messaging services, radio users can create, send, receive, store and display text messages to and from other radio users: individuals or groups. Messages can be freeform (with optional predictive text entry), or one of up to 10 preprogrammed "quick texts".
- Non-display radios can only send quick texts (using programmable buttons). Display radios can send and receive freeform and quick texts, and can store up to 30 received or sent text messages.
- The MOTOTRBO Text Messaging Server extends the service:
  - Radios can send/receive texts to/from email accounts.
  - The MOTOTRBO Text Messaging Application can be run on a Windows PC connected to a MOTOTRBO radio.
  - Dispatchers can use the Application to access an extended feature set, including presence.
- Third party applications are also available to extend text messaging capabilities even further.



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XPR 2500





## **RADIO MANAGEMENT**



### **Summary:**

 Program your radios efficiently, using templates or flexible configuration libraries.

### **Detail:**

- Radio Management is an application that streamlines the programming of your radios particularly large fleets.
- You can create "template" codeplugs that allow efficient cloning of radio configurations while allowing for individual radio identifiers. A template is required for each role and each radio model. Templates and radio programming history records are stored on a database.
- For direct programming, a Device Programmer application (running on a Windows PC) can program up to 16 radios simultaneously. It queries the radio and the database and makes updates as required.
- You can use Over-the-Air Programming to update radios remotely.
- From Radio Management version 2.0, a Device Programmer can use Wi-Fi to send large files to the radio – for example firmware upgrades and voice announcement files. See Wi-Fi Software Updates for details.
- Radio Management 2.0 also introduces "Configuration Mode". This
  allows you to create codeplugs from a library of common components,
  rather than rigid templates. For example you can maintain a common
  set of talkgroups across a system, regardless of radio model.
- The Radio Management application is pre-configured with 10 licenses.
   You must obtain a free-of-charge license (HKVN4101) for each additional radio.



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# **OVER-THE-AIR PROGRAMMING (OTAP)**



### **Summary:**

 The benefits of Radio Management, without the need to touch your radios.

### **Detail:**

- Over The Air Programming allows you to use the data capabilities of MOTOTRBO to update your radios' configurations.
- Using <u>Radio Management</u>, you can define and schedule changes to your radio codeplugs, to be implemented over-the-air. These changes can be:
  - · Enablement of new features
  - New or modified channels, talkgroups and aliases
- Updates are downloaded to the radio in the background, and are implemented according to the schedule you define. The radios do not need to be taken out of service or returned to a central location.
- Your business is not disrupted and users can continue to communicate throughout the process.
- For Connect Plus systems, OTAP connects to the Network Manager, not Radio Management.



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XPR 2500





## **WI-FI SOFTWARE UPDATES**

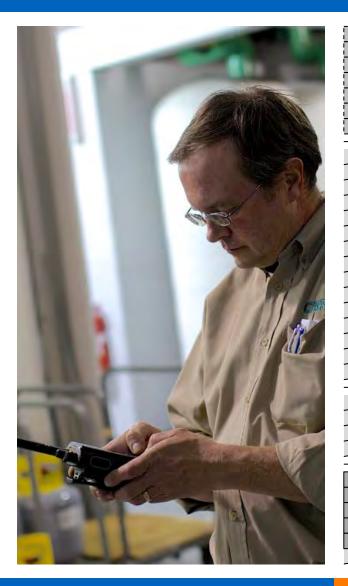


### **Summary:**

 Your radios can now be completely updated, without the need to bring them back to base.

### **Detail:**

- This feature uses the Wi-Fi interface on the latest generation of radios to enhance <u>Over-the-Air Programming</u>. You can now send large files to your radios – for example new radio firmware, voice announcement files and splash screen images.
- This feature requires the new functionality in version 2.0 of Radio Management. The device programmer needs to be connected to the Wi-Fi network, but it can be located remotely – for example located and operated at the Radio Dealership office.
- All the functionality of Over-the-Air Programming is available over Wi-Fi. Updates can be batch-programmed and scheduled for a particular date. Radios continue to operate as normal while they are downloading updates.
- Remote updates save the time and cost of locating all radios, bringing them to a central location and disrupting normal business operations.
- This feature will be introduced in software release 2.6.0.



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# IMPRES™ BATTERY MANAGEMENT



### **Summary:**

 Check the long-term health of your radio batteries whenever they're inserted into a charger

### **Detail:**

- IMPRES Battery Management allows you to check and record the condition of your batteries.
- Whenever a battery is inserted into an IMPRES charger, the charger will read its state and condition, and upload that data to the Battery Management Application (BMA). The BMA maintains a record for each battery, showing age, type, serial number, condition, charging history and health. From this data, you can tell which batteries need to be replaced, and when.
- From this data, you can:
  - Reduce unplanned downtime from unexpected battery failures.
  - Eliminate the waste of premature battery disposal.
  - Reduce your holding of spare batteries.
  - Identify and correct poor workplace charging practices.
  - · Identify missing or lost batteries.
- Chargers must be connected to the BMA using USB or Ethernet.
- You must purchase a license (HKVN4036) to use the IMPRES Battery Management Application.



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XPR 3500 XPR 3300

XPR 2500





# IMPRES™ OTA BATTERY MANAGEMENT



### **Summary:**

 Track the long-term health of your radio batteries while they're in use.

### **Detail:**

- IMPRES Battery Management now supports automatic collection of battery information over the air. This removes the need for wired connections to charger units.
- In the same way as "wired" <u>IMPRES Battery Management</u>, the
  Battery Management Application (BMA) maintains a record for each
  battery that's used on the system. But now the BMA can get its data
  via the MOTOTRBO radio network itself, either through a direct
  MNIS (IP) connection to a repeater, or using a control station.
- Parameters are configurable through the CPS but by default, radios register their battery one hour after they power-up, and a battery's data is read once every 21 days.
- Over-the-air Battery Management manages the long-term health of batteries. It is not meant to show real-time energy levels. If immediate battery data is needed, a manual read of a battery can be requested via the BMA, but this results in additional data traffic.
- This option is available for all system types except Connect Plus.
- This feature was introduced in software release 2.4.



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CP200d

Direct Mode
Conventional
<b>IP Site Connect</b>
Capacity Plus
Capacity Max
Connect Plus





# **HOSPITALITY WORK ORDER TICKETING**

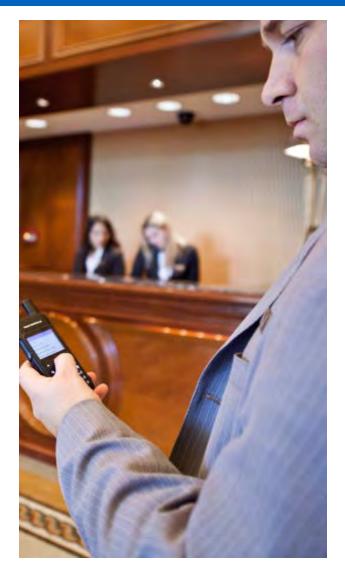


### **Summary:**

 Improved efficiency and accountability for differentiating the guest experience.

### **Detail:**

- Work Order Ticketing allows you to co-ordinate activities and manage issues more efficiently within the hotel or resort.
- MOTOTRBO has been integrated into the world's leading hospitality Work Order Ticketing solutions:
  - HotSOS
  - SynergyMMS
  - eConnect
  - Guestware
- Tickets use pre-configured templates on the radio, simplifying entry and translation. Tickets are allocated to the right users in the right language.
- The work order ticket process can be more discreet than a voice conversation: there are no need to speak any sensitive information or room numbers. The accountability of a ticket also leads to better employee ownership, and can even be linked to staff rewards and compensation.
- Software release 2.3A added new features: Log In/Out, Create Ticket On Radio, Room Status Update.



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# **EVENT-DRIVEN LOCATION UPDATE**



### **Summary:**

 Your radio can be configured to send an alert and location update whenever an event occurs.

### **Detail:**

- To give you better visibility of your fleet and better accountability of your workforce, this feature enables the reporting of events and their locations.
- The MOTOTRBO radio must be connected to the external "trigger" device via the accessory connector GPIO lines. The corresponding "GPS Report" entry in the radio's CPS must also be enabled.
- An alert will then be sent to the dispatcher whenever the event occurs, identifying incident and location. Event examples include:
  - School bus / truck door opening or closing
  - Snowplow vehicle's salt spreader being activated
  - Security guard's weapon being drawn
  - Refinery worker's breathing apparatus low air alarm
- Using a suitable application, you can also record alerts with their time and location and archive them for future reference.
- This feature was introduced in software release 2.4.



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# **SCREEN BACKLIGHT CONFIGURATION**

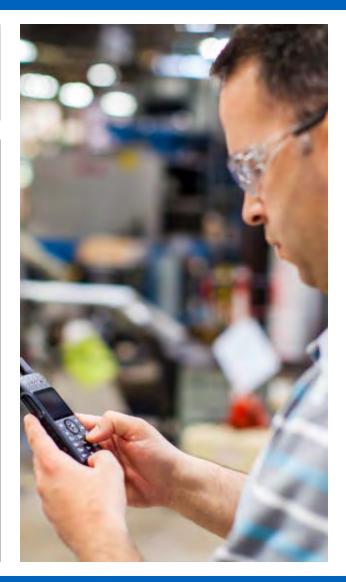


### **Summary:**

 Your radio screen can be configured to light up whenever you need it, and for as long as you need it.

### **Detail:**

- If you can't hear your radio perhaps you're working in an extremely noisy environment, or you turned the volume all the way down – you can use the screen backlight as an alert.
- Rather than just illuminating in response to a key-press, the backlight can be configured to illuminate whenever a call is received:
  - Voice call
  - Text message
  - Job ticket
  - · Telemetry message
  - Call alert
  - Emergency alarm
- The display can be configured to stay on for a suitable interval:
  - 5, 10, 15, 20, 25, 30, 40, 50 or 60 seconds, or indefinitely.
  - Extended backlight use will drain the battery prematurely.
  - To safeguard battery life, the backlight for SL-series radios cannot be left on indefinitely.
- This feature was introduced in software release 2.4.



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SL 7500

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XPR 6580 IS

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XPR 3300

XPR-2500





### **MULTI-BUTTON PTT**



### **Summary:**

 You can create your own radio interface with individual buttons for each channel.

### **Detail:**

- For specific applications, you may need to embed your MOTOTRBO radio interface in a vehicle or control panel, and key up different channels with different external buttons. This feature allows you to realize that. Interfacing to the radio's accessory connector, you can assign inputs to channels.
- For example, you could design an interface panel with 4 buttons and configure it such that pressing button 1 calls dispatch; button 2 calls the supervisor; button 3 calls the maintenance team, and button 4 calls the emergency response crew.
- This is a chargeable feature. To use it, you must first purchase the Entitlement Identification (EID). Button assignments and functions can then be configured through CPS.
- Motorola does not produce customized interface panels, but can advise you on the design of your own.
- This feature was introduced in software release 2.4. For each radio, you must purchase a license (HKVN4280) to use the feature.



SL-7500e
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SL 7500

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XPR 7500

XPR 6580 IS

XPR 6580 IS

XPR 6500

XPR 6300

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XPR 4300

SL300 CM300d CM200d CP200d

XPR 3500

XPR 2500





## LOW VOLTAGE BATTERY TECHNOLOGY



### **Summary:**

 Your radio and battery work together to deliver extremely long talk-times.

#### **Detail:**

- This feature increases the talk-time of portable radios without increasing battery size or weight.
- MOTOTRBO radio power is nominally 7.4V, and a fully-charged battery delivers 7.4V. However, as the battery discharges, its output voltage drops. When the voltage drops to 6V, a standard radio and battery shut off, leaving a significant amount of energy remaining in the battery.
- An enhanced MOTOTRBO radio with a low-voltage battery will continue to operate until the voltage drops to 5V, making more of the battery's capacity available for use. The new "low voltage" batteries are still nominally 7.4V, but provide power down to 5V.
- In this way, real world battery life can be increased to >27 hours.
- Low voltage batteries will work with earlier-generation radios, but without increasing talk-time. New radios are compatible with standard batteries, but will not deliver significantly better battery life.
- This feature was introduced in software release 2.5.



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XPR-2500





## RESTRICTED ACCESS TO SYSTEM



### **Summary:**

 Unauthorized users are prevented from communicating through your repeater.

#### **Detail:**

- RAS (Restricted Access to System) provides two methods to prevent unauthorized subscribers from accessing the system: RAS Key Authentication and Radio ID Range Check. When used together, they provide robust and flexible options to control access.
- RAS Key Authentication: Through the CPS, the repeater and the radios are configured with RAS "keys" (between 6 and 24 characters long). The radio uses its RAS key to encode transmissions, and the repeater uses its key to decode them. If the radio's RAS key is incorrect or missing, the repeater will disregard the transmission.
- Radio ID Range Check: A range of radio IDs is configured in the repeater. Only if the transmitting radio ID is within this range will its transmissions be repeated.
- This feature is available on Conventional, IP Site Connect, Capacity Plus, Linked Capacity Plus systems.
- This feature was introduced in software release 2.2. You must purchase a license per repeater to use this feature:
  - HKVN4177A for XPR 8400 and SLR 5000
  - HKVN4178 for MTR 3000 and SLR 8000



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XPR 3300
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### TRANSMIT INTERRUPT



### **Summary:**

• Use your radio to clear the channel so that urgent traffic can get through.

### **Detail:**

• The Transmit Interrupt suite of features allows a supervisor or dispatcher's radio to clear a channel when it is in use.

**Voice Interrupt** allows a supervisor's radio to stop and clear down a voice transmission, then start a new voice transmission. It is typically used to communicate urgent information to a group in an emergency situation.

**Emergency Voice Interrupt** allows a supervisor's radio to stop a voice transmission, and start its own emergency transmission.

**Remote Voice De-key** allows a supervisor's radio to stop a voice transmission, for example to silence a radio that is inadvertently transmitting.

**Data Over Voice Interrupt** allows a data application to stop a voice transmission and start a data transmission.

- All MOTOTRBO radios can respond to Transmit Interrupt commands.
- Only designated radios can issue Transmit Interrupt commands.
- You must purchase a license (HKVN4085) to use this feature on XPR 3000e, 3000 and 2500 radios.



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XPR 2500









### **DIGITAL EMERGENCY**

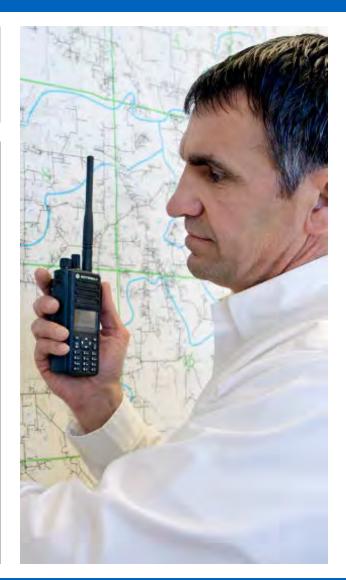


### **Summary:**

 A MOTOTRBO user in distress can sound an alarm to summon assistance.

### **Detail:**

- Digital Emergency can be triggered by a feature (e.g. Man Down), or by pressing the Emergency button or footswitch.
- When the emergency is initiated:
  - Supervisor(s) receive(s) audio and visual alerts with the initiator's ID.
  - Initiating and supervisor radios enter Emergency Mode.
  - Calls contain an emergency indication, and are transmitted using Emergency Voice Interrupt.
- The radio can be configured to do the following:
  - Emergency Alarm only
  - Emergency Alarm and Emergency Call
  - Emergency Alarm with Voice to Follow
  - Emergency Voice Interrupt for Emergency Alarm
  - Emergency Voice Interrupt for Emergency Voice
- Once the situation is resolved, the Emergency is cleared by the supervisor and initiator radios.



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CP200d





## **EMERGENCY SEARCH TONE**

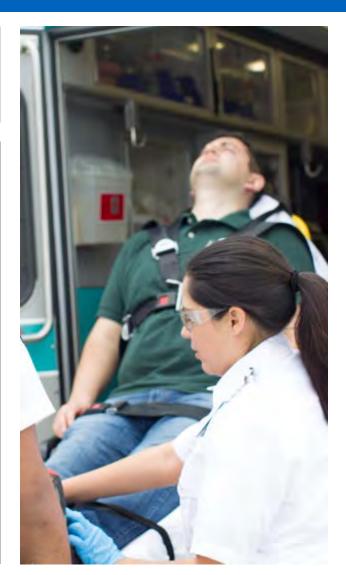


### **Summary:**

 Your radio will sound a loud audio alarm when it enters Emergency Mode.

#### **Detail:**

- When you trigger an Emergency Call, you may not be able to describe your location. If the alarm is triggered by a Man Down notification, you may not even be able to speak.
- The Emergency Search Tone feature causes your radio to emit a continuous attention-grabbing sound as soon as it enters Emergency Mode. Rescuers can then come to your assistance by following the sound of the radio.
- The tone also has some deterrence effect: for example if a security guard feels threatened by a crowd, the Emergency Search Tone will clearly signal to all present that reinforcements are on the way.
- This feature was introduced in software release 2.4A.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500

XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500

SL300
_CM300d
_CM200d
CP200d





### **REMOTE MONITOR**



### **Summary:**

 You can discreetly activate another radio's microphone, and listen in to what's happening

#### **Detail:**

- Sometimes you need to find out more about a radio's situation. For example when one of your staff is incapacitated or unresponsive, or when a radio is suspected stolen.
- The Remote Monitor command instructs the target radio to initiate a private call to the commanding radio. The microphone is activated for a set duration, but without giving any indication to the user.
- Only designated radios can issue Remote Monitor commands.
- All MOTOTRBO radios can respond to Remote Monitor commands.



XPR 7500e XPR 7500e XPR 5500e XPR 5300e XPR 3500e XPR 3300e

SL 7500e

SL 7500 XPR 7550 IS XPR 7500 XPR 7500 XPR 6580 IS XPR 6500 XPR 6500 XPR 6100 XPR 5500 XPR 5500 XPR 4500

> XPR 3500 XPR 3300 XPR 2500

XPR 4300

\_SL300 \_CM300d \_CM200d \_CP200d





### RADIO DISABLE / ENABLE

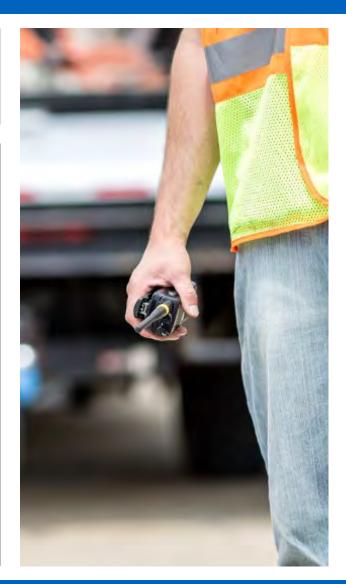


### **Summary:**

 You can use your radio or application to remotely disable and re-enable other radios.

#### **Detail:**

- To have proper control over your radio fleet, you need to be able to remove rogue or stolen radios from service – then re-enable them when they're recovered. This feature gives you that capability.
- The "Disable" command disables a radio, and can be sent from a suitably configured radio, or from a third-party application.
- Once a radio is disabled, it will show a blank display, will not be able to make or receive calls, and will be locked to its site or channel.
- Radios can be re-enabled by using the "Enable" command from a radio or application. The target radio must be turned on and be within coverage of the site or channel where it was disabled.
- Radios can also be re-enabled through the CPS.
- Only designated radios can issue Radio Enable or Disable commands.
- All MOTOTRBO radios can respond to Radio Enable or Disable commands.
- Capacity Max has a similar feature called "Radio Stun / Revive".



0=
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR-3300e

SI 7500e

SL 7500
XPR 7550
XPR 750
XPR 730
XPR 6580
XPR 650
XPR 630
XPR 610
XPR 550
XPR 530
XPR 450

<del>SL300</del>
_CM300d
CM200d
_CP200d
2000

XPR 4300

XPR 3300

XPR 2500







### **MAN DOWN**



### **Summary:**

• If the radio's position or movement falls outside normal user behavior, it initiates an emergency call.

### **Detail:**

- This feature is designed to safeguard workers who are at risk of being incapacitated in a hazardous environment.
- The radio contains a timer which can be activated if:
  - · Movement: Radio moves
  - No movement: Radio stops moving
  - Angle: Radio is tilted beyond a certain angle
  - Angle + No movement: Radio is tilted and stops moving
- When the timer expires, the radio will sound a warning to the user. If the warning is not acknowledged promptly, the radio will initiate an emergency call. At the same time it will start audible and visual beacons on the radio, to help rescuers find the user quickly.
- The feature is available on radios with a built-in accelerometer:
  - XPR 6580 IS, XPR 7550 IS, SL 7000e and XPR 7000e Series radios
  - For each radio, you must purchase a license (HKVN4179A) to use the feature.
- It is also available through the Connect Plus Option Board:
  - XPR 6000, XPR 7000, XPR 7000e and SL 7000e Series radios on a Connect Plus system
  - For each radio, you must purchase a license (HKVN4072) to use the feature.



XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR-3300e

SL 7500e

XPR 330
SL 750 XPR 7550 XPR 756 XPR 730 XPR 6580 XPR 650 XPR 630 XPR 610
XPR 550 XPR 530
XPR 450 XPR 430





### **LONE WORKER**

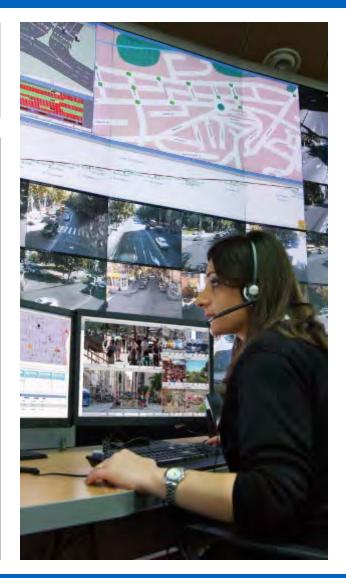


### **Summary:**

• If a user shows no signs of activity for a period, the radio will initiate an emergency call.

#### **Detail:**

- This feature is designed to safeguard workers who are working alone. All parameters are configured through the CPS software.
- If there is no activity on the radio for a period of time, the radio will
  issue an alert to the user. If the user does not acknowledge the alert
  promptly, the radio will initiate an emergency call. At the same time
  it will start audible and visual beacons, to help rescuers find the
  user quickly.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

711 11 00000
SL 7500
XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500

XPR 3300 XPR 2500





## **BASIC PRIVACY**

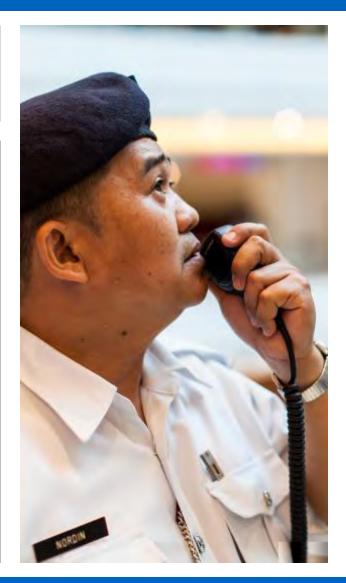


### **Summary:**

 Your radio encodes your voice and data to prevent you being overheard.

#### **Detail:**

- Basic Privacy is a simple feature that helps keep your voice and data calls confidential without impacting your system performance.
- The feature is designed to prevent casual eavesdropping, but does not provide strong protection against a determined hacker. It uses a digital algorithm to encode voice and data, using a single 16-bit key from the 255 predefined keys available. Signalling and control messages are not encoded.
- Basic and Enhanced Privacy features use Motorola proprietary mechanisms, and are not interoperable. Privacy types cannot be mixed within a system.
- Enhanced Privacy provides a higher level of protection than Basic Privacy, but may result in slightly lower voice quality and slightly increased system access times.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500
XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500

SL300	
CM300d	
CM200d	
CP200d	





### **ENHANCED PRIVACY**



### **Summary:**

 Your radio encodes your voice and data to protect your calls.

#### **Detail:**

- Enhanced Privacy is a feature that helps keep your voice and data calls highly confidential.
- The feature is designed to be a strong protection against a
  determined attack. It uses the ARC4 cryptographic digital algorithm
  to encode voice and data using a 40-bit key. The radio can store 16
  different keys, and can use different keys for different channels. All
  voice and data calls are encoded, but signaling and control
  messages are not.
- Basic and Enhanced Privacy features use Motorola proprietary mechanisms, and are not interoperable. Privacy types cannot be mixed within a system.
- Enhanced Privacy provides a higher level of protection than Basic Privacy, but may result in slightly lower voice quality and slightly increased system access times.
- You must purchase a license (HKVN4084) to use this feature on XPR 3000e, 3000 and 2500 radios.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500 XPR 7550 IS

711 11 1 0000 10
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500

<del>SL300</del>
_CM300d
_CM200d
_CP200d

Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max
Connect Plus





### **IP RATING**



### **Summary:**

 Your radio is built to be tightly sealed against dust and moisture.

#### **Detail:**

- The IP Rating (International Protection or Ingress Protection) is a 2-digit code that declares how well a product is sealed.
- The first number refers to protection against solid objects:

#	Object Size	Example
0	_	No protection against contact and ingress of objects
1	>50 mm	Protected against large objects
2	>12.5 mm	Protected against fingers
3	>2.5 mm	Protected against tools
4	>1 mm	Protected against wires
5	Dust	Dustproof: Dust may enter, but not enough to interfere with product operation
6	Dust	Dust-tight: No dust may enter

• The second number refers to protection against liquids:

#	Protection
0	Not protected against liquid intrusion
1	Protected against vertical dripping water
2	Protected against water dripping at an angle
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets
6	Protected against powerful water jets
7	Protected against immersion (up to 1m / 3ft for 30 mins)
8	Protected against immersion (beyond 1m / 3ft – Motorola tests to 2m / 6.6 ft for 2 hrs)

- For example, a radio rated IP56 is dustproof and waterproof, but not submersible.
- Portable radios generally require better sealing than mobile radios.



IP54	SL 7500e
IP68	XPR 7500e
IP68	XPR 7300e
IP54	XPR 5500e
IP54	XPR 5300e
IP67	XPR 3500e
IP67	XPR 3300e

IP54	SL 7500
IP67	XPR 7550 IS
IP57	XPR 7500
IP57	XPR 7300
IP67	XPR 6580 IS
IP57	XPR 6500
IP57	XPR 6300
IP54	XPR 6100
IP54	XPR 5500
IP54	XPR 5300
IP54	XPR 4500
IP54	XPR 4300
IP55	XPR 3500
IP55	XPR 3300
IP54	XPR 2500

IP54	SL300
IP54	CM300d
IP54	CM200d
IP54	CP200d





## HAZARDOUS LOCATION CERTIFICATION



### **Summary:**

 Your radio is certified for use in flammable and explosive environments.

#### **Detail:**

- A "HazLoc" (Hazardous Location) is an area where flammable or explosive gases, liquids, dust or "flyings" may be encountered.
- Health and safety regulations often mandate that products used in these areas must be HazLoc-certified: specifically designed not to cause accidental sources of ignition. The industry standards are:
  - FM\_3688: Factory Mutual standard, also tested and certified by Factory Mutual. This standard is retired: no new product can be manufactured after 2015, although current product remains safe and compliant. Product has a green certification marking.
  - TIA-4950: TIA (Telecommunications Industry Association) standard. Motorola product is tested and certified by UL (Underwriters' Laboratories). Product has a white certification marking.
  - CSA157: Specified and certified by the Canadian Standards Association. Product is colored blue.
- For compliance, the radio must use the correct battery: FM batteries cannot be used on TIA/UL radios and vice versa. From software release 2.5, you can program the radio to sound an alert if the wrong battery is installed: see <u>HazLoc Battery Mismatch Alert</u> feature.



SL-7500e XPR 7500e XPR 7300e XPR 5500e XPR 5300e XPR 3500e XPR 3300e

> SL-7500 XPR 7550 IS XPR 7550 IS XPR 7500 XPR 6580 IS XPR 6500 XPR 6300 XPR 6100 XPR 5500 XPR 5300 XPR 4500

XPR 4300

XPR 3500

XP<del>R 33</del>00 XP<del>R 25</del>00

SL300 CM300d CM200d CP200d



## HAZLOC BATTERY MISMATCH ALERT



### **Summary:**

 Your radio can alert you when the wrong battery is attached.

### **Detail:**

- This feature provides an audible and visual alert when an FM-approved battery is attached to a UL-approved radio and vice versa.
- The radio certification type (None, FM or UL) must be set when the radio is programmed via the MOTOTRBO CPS.
- During power up, the radio detects the attached battery. If the battery does not match the radio certification type, the radio will respond according to the matrix below:

CPS Selection		Battery Attached	Radio Response on Mismatch
None	•	-	The feature is disabled
FM	FM approved radio validation for attached FM approved battery.	UL	Display radios: "Wrong Battery" message appears on the display.
UL	UL approved radio validation for attached UL approved battery.	FM	Red LED will flash and Wrong Battery alert tone or announcement repeated every 5 seconds.  Non-Display radios: Red LED and Wrong Battery alert is repeated every 5 seconds.

For a list of Hazloc-approved radio models or corresponding batteries, refer to the FM manual (687153L01) or UL manual (MN00111A01).



SL-7500e
XPR 7500e
XPR 7300e
XPR-5500e
XPR 5300e
XPR 3500e
XPR 3300e

XPR 3300
_SL-7500
XPR-7550
XPR 750
XPR 730
XPR-6580
XPR 650
XPR 630
XPR 610
XPR-550 _XPR-530
XPR 450

_SL300
CM300d
CM200d
CP200d

Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max
Connect Plus

SLIDE



## **INDOOR LOCATION TRACKING**



### **Summary:**

 Your radio systems tracks your workers, even when they are inside the building.

### **Detail:**

- This feature uses Bluetooth Low Energy (a mode of Bluetooth 4.0) in the latest MOTOTRBO radios to find the position of radios inside a building.
- It relies on Bluetooth beacons ("iBeacons"), which are installed at known, fixed points around the building. These small, batteryoperated units broadcast their unique identifier over Bluetooth.
- The radio continually listens for iBeacons, and periodically sends a measurement report (beacon IDs and their signal strengths) over the MOTOTRBO data channel to a dispatcher application.
- The application uses the report to calculate the likely position of the radio and displays it on a map in a similar way to GPS. The more beacons the radio reports, the more accurate the location fix will be.
- Motorola will offer iBeacons for sale as part of this solution. Compatible applications are available from our Application Partners.
- This feature will be introduced in software release 2.6.0. For each radio, you must purchase a license (HKVN4432A) to use the feature.



SL 7500e XPR 7500e XPR 7300e XP<del>R 550</del>0e XPR 3500e

XPR-33006 SL 7500 XPR 7500 XPR-6580 IS XPR 6300 XPR 6100 XPR 5300 XPR 4500 XPR 4300 XPR 3500

> \$1300CM300d CM200d CP200d

XPR 3300 XPR-2500







### **BLUETOOTH AUDIO**

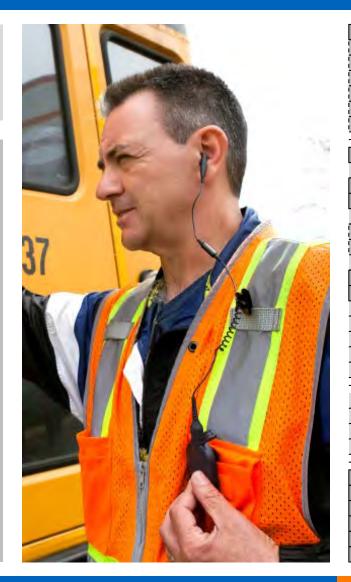


### **Summary:**

 Step away from your desk, step out of your driving seat, and still stay connected.

### **Detail:**

- The Bluetooth Audio feature allows you to connect wireless audio accessories such as headsets, earpieces and push-to-talk buttons to your radio. You are free to roam up to 10 meters (30 feet) from your radio, while staying connected to your colleagues.
- For users of mobile radios, you can step out of the cab, check the load of your truck, supervise the children in the back of the bus and deliver the package to the front door all without losing connectivity.
- For users of portable radios, you can leave your radio on your desk, move freely around your office and still stay in touch.
- Bluetooth Audio also enables the use of specialised accessories, such as an in-ear earpiece for covert communications.
- Next-generation radios are compatible with Bluetooth 4.0, but this
  delivers no additional audio functionality.
- For "Capable" models, you must purchase the Bluetooth Bundle license (HVKN4249) to use this feature. On "Enabled" models and some other radios it is pre-activated. Please check availability of Bluetooth on XPR 3000e Series radios.
- For XPR 6000 Series radios, you must purchase an external Bluetooth dongle (PMLN5712).



	SL	7500
XE	2R-7	7 <del>55</del> 0
>	(PR	750
>	(PR	730
_XE	2R-(	<del>5580</del>
>	(PR	650
>	(PR	630
ذ_	(PR	610
>	(PR	550
>	(PR	530
	(PR	450

CI 200
_ <del>SL300</del>
CM300d
CM200d
_CP200d

Direct Mode
Conventional
<b>IP Site Connect</b>
Capacity Plus
Capacity Max
Connect Plus



### **BLUETOOTH DATA**

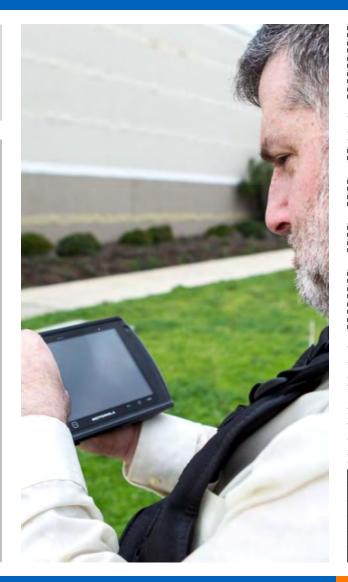


### **Summary:**

 Your radio can interface with other Bluetooth devices, for easier data entry and control.

### **Detail:**

- To enhance the data capabilities of MOTOTRBO radios, you can interface a Bluetooth data entry device to the radio – for example a barcode scanner. When used with a Work Order Ticketing system, this significantly increases the convenience of the user interface.
- Other smart devices can also use the Bluetooth data connection as a network interface (Personal Area Network, or PAN). For example, a PC or tablet can use the secure, resilient MOTOTRBO network to connect to a database of biometric records or license plate information.
- Bluetooth 4.0 (in enhanced radios) delivers:
  - Classic Bluetooth: Backwards-compatibility with earlier devices.
  - Bluetooth Low Energy: Lower power consumption, with approximately the same range. Optimized for fast setup of simple links – so ideal for applications such as <u>Indoor Location Tracking</u>.
- Future interoperability with new Bluetooth accessories and sensors
- For "Capable" models, you must purchase the "Bluetooth Bundle" license (HKVN4249) to use the feature.
- For other radios, you must purchase a license (HKVN4088) to use the feature.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR-3300e

SI 7500

3L /300
XPR-7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
VDD 04-00

XPR 6100 XPR 5500 XPR 5300 XPR 4500 XPR 4300

XPR 3300 XPR 2500 SL300

XPR 3500

CM300d CM200d CP200d



### **TELEMETRY**



### **Summary:**

 Use your radio network to interconnect people, machines and sensors.

#### **Detail:**

- MOTOTRBO radios have a programming interface that can also support GPIO (General Purpose Input / Output) and USB signalling for telemetry purposes.
- This can be used to connect MOTOTRBO users to sensors:
  - For example, your alarm system can be connected to a MOTOTRBO radio, so you receive a text alert on your radio when an intrusion is detected. Or your production machinery can be connected to a MOTOTRBO radio, so your maintenance technicians receive breakdown notifications on their radios – including diagnostic information, if required.
- It can also be used to connect MOTOTRBO users to actuators:
  - For example you can connect a MOTOTRBO radio to the door lock of a secure facility – and lock and unlock the door remotely using your radio.
- And it can be used for a combination of both:
  - For example a remote environmental sensor can send periodic readings to a remote server, using a data channel on the MOTOTRBO system.



SL-7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7	7500
XPR 7	<b>'</b> 550
XPR	750
XPR	730
XPR 6	580
XPR	650
XPR	630
XPR	610
XPR	550
XPR	530
XPR	450
\/DD	4

_ <del>SL300</del>	
CM300d	
CM200d	
CP200d	-
<b>2</b> 1 2000	

Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max
Connect Plus





### PRE-CONFIGURED TELEPHONE PATCH

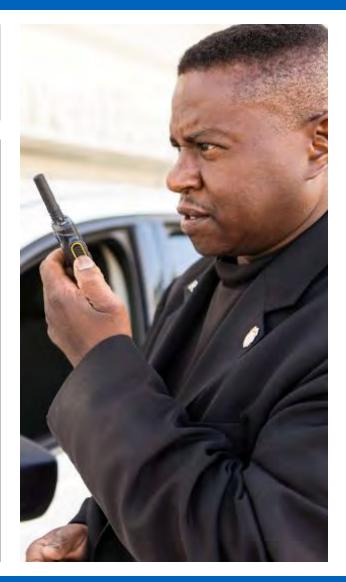


### **Summary:**

 Telephone users can connect to a pre-configured radio channel quickly and easily.

### **Detail:**

- The existing MOTOTRBO telephone patch offers flexibility, but access can be time-consuming:
  - The telephone user dials a specific number or extension
  - After hearing the tone, they have 3 seconds to enter the radio ID and repeater slot number on their telephone keypad.
  - They will then be connected to the radio user or talkgroup.
  - If there is an error, the tone will repeat, prompting them to reenter the radio ID and repeater slot number.
- This new enhancement allows the configuration of a "default" radio user – for example Security. If the system does not detect an entry within 3 seconds of the tone, the telephone user is automatically connected to Security.
- So, for example, all the desk-phones at a facility can be preprogrammed with an "Emergency" number that will always reach Security. Advanced users know they can reach other radio users by entering additional information.
- This feature was introduced in software release 2.4.



SL 7500e
XPR 7500e
XPR 7300e
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XPR 3500e
XPR 3300e

SL 7500
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XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500

SL300	
CM300d	
CM200d	
CP200d	





### **INTEGRATED WI-FI**

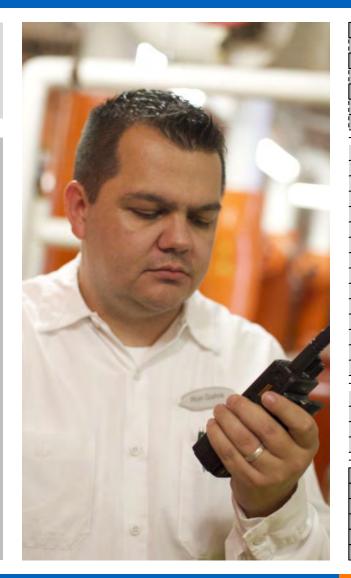


### **Summary:**

Your radio now has a broadband interface.

#### **Detail:**

- Wi-Fi connectivity is now available on selected MOTOTRBO radios.
- The Wi-Fi interface is compliant to 802.11b/g/n, and supports up to 8 Mbps data rates. It is designed to access only private Wi-Fi networks, using WPA, WPA-2 or WEP security protocols.
- The initial application will be for downloading large configuration files to the radio, for example new radio firmware, voice announcement files and screen images. This will be available in software release 2.6.0, and will require the new functionality of Radio Management version 2.0. See Wi-Fi Software Updates for details.
- Wi-Fi is not designed to enable broadband services such as internet browsing on a MOTOTRBO radio, however there will be opportunities to use Wi-Fi for other purposes in the future. It is also expected that Application Development Partners (ADPs) will use the Wi-Fi interface for new applications.
- This feature was introduced in software release 2.5. For each radio, you must purchase a license (HKVN4381) to use the feature, except for "Enabled" radios, where it is pre-activated.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL-7500 XPR-6580 IS XPR 6300 XPR 6100 XPR 5300 XPR 4500

> SL300 CM300d CM200d CP200d

XPR 3500

XPR 3300

XPR-2500







### SYSTEMS SUMMARY



SITE CONNECT	CAPACITY PLUS	CAPACITY MAX	CONNECT PLUS
CONVENTIONAL		TRUNKING	
((12)) ((12)) ((12)) ((12)) ((12))	((12)) (((12)) (((12)) (((12))	(((1)) (((1)) (((1)) (((1))) (((1)))	((12)) ((12)) ((12)) ((12)) ((12)) ((12)) ((12))
UP TO 15 SITES	UP TO 15 SITES	UP TO 15 SITES	UP TO 250 SITES

BASELINE COVERAGE

UP TO 200 USERS\*

COST-EFFECTIVE COVERAGE AND CAPACITY

UP TO 1600 USERS/SITE\*

COVERAGE, CAPACITY AND CONTROL

**UP TO 3000 USERS/SITE\*** 

EXCEPTIONAL COVERAGE

**UP TO 3000 USERS/SITE\*** 



### **DIRECT MODE / TALKAROUND**



### **Summary:**

 Fallback connectivity, for local area communications or during power outages.

#### **Detail:**

- All MOTOTRBO radios are able to connect to each other directly, without the need for any infrastructure such as a repeater.
   Coverage and capacity are limited, but for a situation such as a power outage, a basic level of communications is still possible.
- Radios communicate on a single 12.5kHz channel. If Dual Capacity Direct Mode is configured, the radios can use both timeslots on the channel for independent conversations.
- Coverage (range) is limited, as the power of a radio is much less than that of a repeater.
- "Direct Mode" usually refers to a system that is solely capable of radio-to-radio communications. "Talkaround" is a fallback mode of operation for conventional or trunked systems.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500

XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500

SL300	
CM300d	
CM200d	
CP200d	





## **SINGLE SITE CONVENTIONAL**



### **Summary:**

Baseline single site capacity and coverage.

#### **Detail:**

- The Single Site Conventional architecture consists of a single repeater supporting communications for up to 200 users. This configuration provides capacity and coverage over a wide area using a pair of 12.5kHz channels, one of which is used for radio transmissions, the other for repeater transmissions.
- Each channel is further divided into two independent timeslots. To the end user, this means they now have two voice or data channels that can be managed independently, instead of one.
- This configuration can also support **Dynamic Mixed Mode**, where the repeater dynamically switches between analog and digital based on the call it receives from the radio:
  - If an analog radio transmits, the repeater switches to analog mode to repeat the analog call (one call per channel).
  - If a digital radio transmits, the repeater switches to digital mode to repeat the digital call (up to 2 calls per channel).





SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500

XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500

SL	_300
CN	1300d
CN	1200d
CP	200d





## **IP SITE CONNECT**

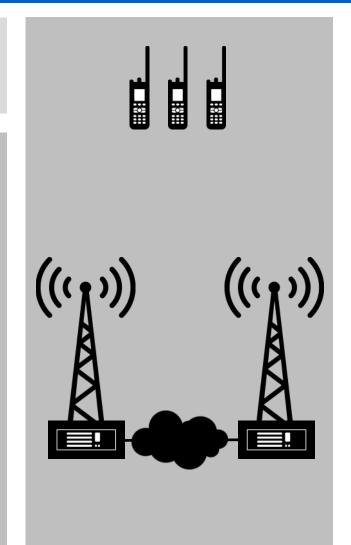


### **Summary:**

Multi-site interconnection, for better coverage.

#### **Detail:**

- **IP Site Connect** allows you to interconnect up to 15 MOTOTRBO repeaters to increase the coverage area of a system. The repeaters can be in adjacent locations, or geographically isolated.
- The interconnection is directly between repeaters, using an IPv4
  network. No new hardware is required, besides backend network
  devices such as routers. Traffic on the IP network is authenticated
  and can be protected. VPNs are also supported.
- All calls are repeated by all repeaters, so the capacity of the system is approximately the same as the capacity of a single digital repeater. Roaming is supported, but not during an active call.
- The RDAC (Repeater Diagnostics and Control) tool is available to manage all repeaters from a single location.
- IP Site Connect can also be used to provide multi-band support on a single site – for example by interconnecting an 800 MHz repeater with a UHF repeater.
- You must purchase a license (HKVN4154) to use XPR 7500e, 3000e, 3000 and 2500 radios on an IP Site Connect system, except for "Enabled" radios, where it is pre-activated.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

XPR 3300e
7111100000
SL 7500
XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500

<del>SL300</del>
_CM300d
_CM200d
CP2000

XPR 3300

XPR 2500

Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max

Connect Plus



## **CAPACITY PLUS (SINGLE/MULTI-SITE)**

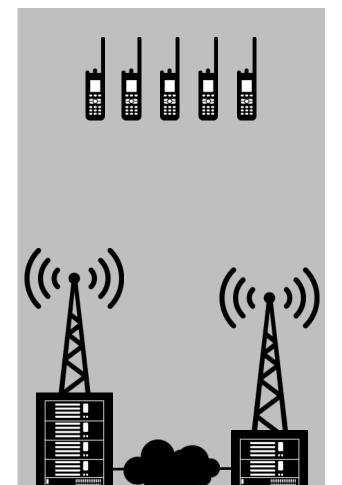


### **Summary:**

• Single and multi-site dynamic trunking for better capacity and coverage.

#### **Detail:**

- Capacity Plus is an entry-level trunked system for single and multiple sites.
   Multi-site Capacity Plus was previously called Linked Capacity Plus.
- Up to 15 sites can be interconnected, with up to 8 trunked voice and data repeaters (16 channels) per site. You can also configure up to 12 "data revert" repeaters (24 channels) per site, but the total repeaters per site cannot exceed 12 for a multi-site system and 20 for a single-site system.
- The systems use "dynamic trunking":
  - · All radios start on a "rest channel"
  - When a radio requests a channel, the repeater turns the rest channel into a traffic channel, and initiates the call there.
  - The repeater then finds an unoccupied channel and directs all radios not participating in the call to adopt this as the new rest channel.
- Capacity Plus does not require the allocation of a dedicated control
  channel. It has no centralized controller and is therefore very fault-tolerant.
  It automatically detects most types of failures, reconfigures itself, and
  continues to operate (with reduced capacity).
- You must purchase a license per radio (HKVN4413 for single site, HVKN4414 for multi-site) to use XPR 7500e, 5500e, 3000e, 3000 and 2500 radios on a Capacity Plus system, except for "Enabled" radios, where it is pre-activated. SL300 is only compatible with a Single Site Capacity Plus system with up to 2 repeaters.
- You must purchase a license for each repeater:
  - HKVN4427 (single) or HVKN4099 (multi) for XPR 8400 and SLR 5000
  - HKVN4439 (single) or HVKN4110 (multi) for MTR 3000 and SLR 8000



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500 XPR 7550 IS

XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500







### **CAPACITY MAX**

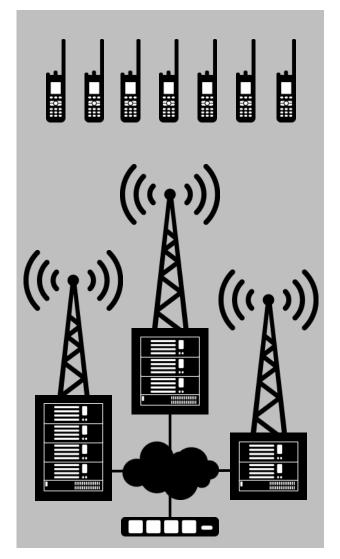


### **Summary:**

• Full trunking for single and multi-site deployments, with enhanced control capabilities.

#### **Detail:**

- Capacity Max is a next generation trunking solution, built on our extensive real-world experience in DMR radio systems.
- It uses a dedicated control channel on each site. A single centralized server (redundancy optional) controls the system. All signaling and traffic is routed over a standard IP network. Data flow is optimized to reduce network load and improve scalability.
- In the first release, Capacity Max will support up to 15 sites, with up to 15 trunked voice and data repeaters (29 channels) per site. You can also configure up to 6 "data revert" repeaters (12 channels) per site.
- Capacity Max is integrated into the standard MOTOTRBO software release, and has a full feature set. System Advisor and Radio Management applications simplify maintenance and monitoring.
- Radios can be operated in 2 modes:
  - Advantage Mode: MOTOTRBO radios and infrastructure. Performance-optimized. Full feature set.
  - Open Radio Mode: MOTOTRBO radios, another vendor's infrastructure. DMR Tier III Mode of Operation. Limited feature-set.
- You must purchase a license (HKVN4324) per radio for XPR 7500e, 7000, 5500e, 5000 and SL 7000 radios, except for "Enabled" models, where it is pre-activated.
- You must purchase an "Advantage" license (HVKN4324) per repeater, which allows system operation in Advantage Mode only.
- This system type will be introduced in software release 2.6.0.



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR-3500e
XPR 3300e
CL 7500
SL 7500
XPR 7550 IS
XPR 7500
XPR 7300
XPR-6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500
<del>SL300</del>
CM300d
CM200d
CP200d
Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max



### **CONNECT PLUS**

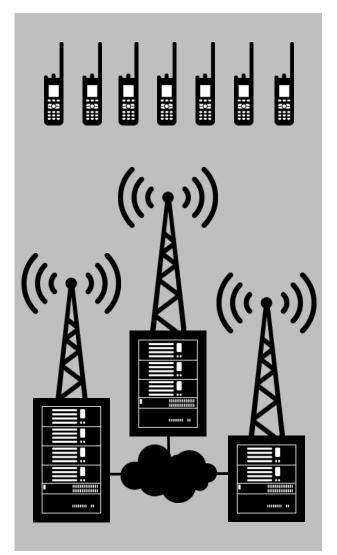


### **Summary:**

• Full trunking for single and multi-site deployments, with enhanced control capabilities.

#### **Detail:**

- Connect Plus is a full trunking solution based on DMR technology. It uses a dedicated control channel for channel requests and allocations.
- Connect Plus can be deployed as a single or multi-site system, up to a maximum of 250 sites. A maximum of 15 repeaters can be trunked per site: maximum system total cannot exceed 420 repeaters.
- An XRC controller is located at each site. Voice and data consoles are connected to the system using the XRT Gateway, and the XRI Interconnect Gateway provides telephone interconnect capability.
- The system provides enhanced security. Registration is controlled by Unit ID, Serial number, Site ID and Talkgroup ID. Voice traffic is encrypted, and radios can be remotely deactivated in case of loss or theft.
- To enhance resiliency, there is periodic rollover of the control channel, and soft failover in response to IP connectivity failure. Redundant controllers and gateways can also be provisioned.
- The XRT gateway can also be used to interconnect a WAVE server, enabling PTT services over a cellular network.
- You must purchase a license (HKLN4457) per radio to use SL 7000, XPR 7500e, 7000, 6000, 5500e, 5000, 4000 radios on a Connect Plus system, except for "Enabled" radios, where it is pre-activated.



CI 7500°
SL 7500e XPR 7500e
XPR 7500e XPR 7300e
VDD CC00-
XPR 5500e XPR 5300e
XPR 3500e
XPR 3300e
SL 7500
XPR 7550 IS XPR 7500
VDD 7200
XPR 6580 IS
XPR 6500
VDD 6200
XPR 6300
XPR 5500
XPR 5500 XPR 5300
XPR 5500
XPR 4300
XPR 4300 XPR 3500
XPR 3300
XPR 2500
APR 2000
_\$L300
<del>SE</del> 300
<u>CM200d</u>
CP200d
<del>SF2</del> 000
Direct Mode
Conventional
IP Site Connect
Capacity Plus
Capacity Max
Connect Plus

Connect Plus



### **DIGITAL VOTING**

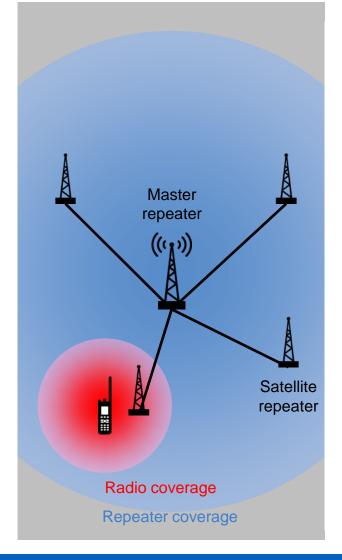


### **Summary:**

 Cover a wider area with your MOTOTRBO system, without the cost of adding transmitters

#### **Detail:**

- Because of its better transmitter power and antenna height, a repeater can transmit a signal much further than a user's radio can. This means that system coverage is usually limited by "talk-back" range rather than "talk-out" range.
- The Digital Voting solution introduces extra repeater sites, configured in receive-only mode. The "Master Repeater" analyzes the signals received from the "Satellite Repeaters" and selects (votes) on which one to repeat.
- This feature improves coverage without the need to invest in extra transmitter frequencies. The satellite sites are also lower cost to implement, as they need less power, fewer antennas and lower bandwidth connections.
- This feature was first introduced in software release 2.3
- You must purchase a license per repeater
  - HKVN4243 for MTR 3000 and SLR 8000
  - HKVN4242 for XPR 8400 and SLR 5000



SL 7500e
XPR 7500e
XPR 7300e
XPR 5500e
XPR 5300e
XPR 3500e
XPR 3300e

SL 7500
XPR 7550 IS
XPR 7500
XPR 7300
XPR 6580 IS
XPR 6500
XPR 6300
XPR 6100
XPR 5500
XPR 5300
XPR 4500
XPR 4300
XPR 3500
XPR 3300
XPR 2500
<u> </u>

SL300	
CM300d	ĺ
CM200d	I
CP200d	I
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**Radio Solutions Channel Partner** 





# **VERSION HISTORY**



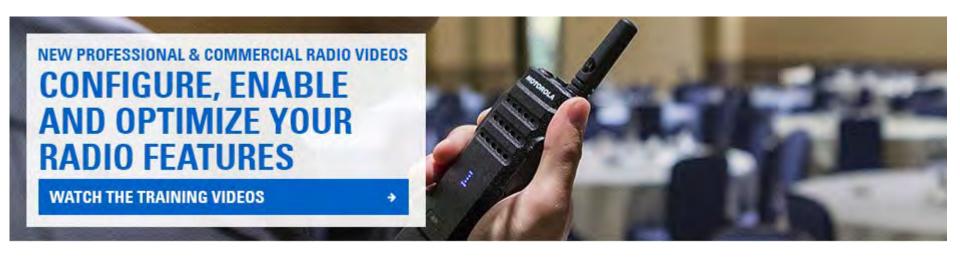
1.0	Initial release		26-Feb-2014
1.11	Update	Corrections, added Digital Voting	06-Mar-2014
1.12	Update	Radio Enable/Disable name change	13-Mar-2014
2.0	Update	Added new features, added systems, added introduction, added version number, corrected errors.	11-Sep-2014
2.1	Update	Add SL300	7-Oct-2014
2.11	Update	Corrected errors	9-Oct-2014
2.2	Update	Added release 2.4 features, corrected errors	1-Dec-2014
2.21	Update	Corrected Lone Worker radio compatibility	5-Dec-2014
2.3	Update	Added release 2.4A and Connect Plus 1.6 features, general updates to format, added navigation.	29-Jun-2015
2.4	Unpublished		
2.5	Update	Added features for release 2.5 and 2.6.0 Added next-generation radios and Capacity Max Combined Capacity Plus and Linked Capacity Plus Added system compatibility per feature Added license numbers	29-Feb-2016

Please send feedback to Ben Ansell: <u>ben.ansell@motorolasolutions.com</u>



### **ADDITIONAL INFORMATION**





A selection of training videos have been produced to show you how to configure these features.

They are available on the Motorola Solutions YouTube channel:

http://www.youtube.com/playlist?list=PL-qcM\_OQqRgggcuaNUDp68piyNla8HFTV



### **PRODUCT TRAINING**





http://www.motorolasolutions.com/US-EN/Training+Home/Certification+Program