Tecnitrān
TELECOMUNICACIONES

MXP660

Multi-bearer portable TETRA radio

Frontline safety, today and tomorrow



The MXP660 is a rugged and lightweight, yet fully capable, TETRA portable radio with built-in LTE that's easy to carry and easy to use. So that vital messages get through, the MXP660 has the option to ramp up to Class 3 TETRA transmission power. If an MXP660 user goes outside of TETRA coverage, the radio can automatically switch to available LTE or Wi-Fi broadband, maintaining DIMETRA™ features and workflows via DIMETRA Connect.

Clarity of voice communication is also critical. Noise reduction technology, trained through Artificial Intelligence (AI) machine-learning, is integrated into the MXP660 to suppress loud background noise and improve the clarity of calls — so users can hear and be heard.

The MXP660 also helps reduce your total cost of ownership. Expensive and time-consuming radio management chores are streamlined with LTE and Wi-Fi over-the-air updates. Technologies like Bluetooth® 5.3 and Near-Field Communication (NFC) enable rich and secure collaboration with smartphones, tablets and other Bluetooth devices such as body cameras or audio accessories. The MXP660 protects your existing investment by letting you reuse most of your MXP600 accessories including chargers, batteries and audio accessories.

The MXP660 is ready to respond to sudden changes in the field and future changes in technology. It helps equip your frontline staff to efficiently and effectively get the job done.

Key attributes

- Stay connected via built-in LTE and Wi-Fi
  - Works with DIMETRA Connect to help stay connected outside of TETRA coverage
- Mission-critical TETRA portable radio
  - AI-trained noise suppression
  - Class 3 transmission
  - Rugged and secure
- Designed for low total cost of ownership
  - Streamline radio updates: LTE over-the-air updates (OTA-updates) and over-the-air-programming (OTAP) out in the field, anywhere at any time
  - Reuse most of your MXP600 accessories
- Futureproof features protect your investment
  - Bluetooth 5.3 and NFC
  - M-Radio Control app from a smartphone or tablet
- Compact yet easy to use
  - T-bar style grip
  - Small and light

MOTOROLA SOLUTIONS

GENERAL SPECIFICATIONS

Height	126 mm
Width	54 mm (64 mm for T-bar style grip at top)
Depth	• 25 mm (with IMPRES2 1900 mAh battery) • 30 mm (with IMPRES2 2900 mAh or 3400 mAh battery)
Weight	• 213 g (with 1900 mAh battery, without antenna) • 225 g (with 1900 mAh battery and 60 mm antenna)
Battery options	• 1900 mAh IMPRES2 battery • 2900 mAh IMPRES2 battery[1] • 3400 mAh IMPRES2 battery

USER INTERFACES

Display	• 2.4" transflective display with 65k colours • Easy to read modern user interface • Backlight option • Flip screen option • Scalable text size option • Customisable screensaver image • Universal time display • Configurable time out • User configurable multiple display languages
Controls	• Backlit keypad • Dual function rotary knob • 3 configurable side buttons • Configurable one touch keypad (10 programmable numeric keys)
Sensors	• Accelerometer • Ambient light
Talkgroup management	User friendly, flexible, fast and efficient interface
Talkgroups	• Dual layer folder structure (folder/subfolder) • TMO folders: up to 500, TMO talkgroups: up to 10000 • DMO folders: up to 128, DMO talkgroups: up to 2000 • 4000 TMO Entries (up to 2048 entries in one folder)
Favourite talkgroup folders	Up to 3
Scan lists	40 lists of up to 20 groups
Country / Network code list	Up to 100
Menu	• Customisable menu list catering each user's need • Menu shortcuts are available
Contacts management	Rapid search to find the contact easily
Contacts	Up to 1000 contacts with 6 numbers per contact, (maximum 2000 unique numbers)
Dialling methods	One-Touch buttons, from the favorite folders, from the address book, from the recent calls list, direct dialing, from the embedded numbers in short data service messages, speed dialing, talkgroup dialing by index
Call alert	Vibrate alert and multiple ring tones
Message management	Distinct folders for each message type for flexible message management.
Text message list	• SDS: Up to 200 entries (short messages) • At least 20 entries for outbox (long messages - up to 1000 characters) • At least 10 entries for inbox (long messages - up to 1000 characters) • Concatenation up to 1000 characters • TMO and DMO
Status list	400 pre-defined messages assignable to one touch buttons
Text entry	Predictive keypad text entry
Covert mode	Turns the device into stealth mode for undercover operation
Safety	Fall alert (man down)

AUDIO

Audio power at rated	2 W
Audio distortion at rated	<1%
Audio power at maximum	2.2 W
Maximum loudness	• 99 phon (standard profile) • 102 phon (loud profile)
Noise supression	AI-noise suppression (high and low suppression options)
Acoustic feedback (howling) suppression	AI-noise suppression also suppresses acoustic feedback (howling)
Echo cancelling	AI-noise suppression also improves echo cancelling significantly
Number of microphones	2 microphones (on front top and on front bottom)
HD voice	Hardware ready (8 KHz bandwidth)

CONNECTIVITY

LTE

LTE bands	B1 (2100 MHz), B2 (1900 MHz), B3 (1800 MHz), B4 (1700 MHz), B7 (2600 MHz), B8 (900 MHz), B20 (800 MHz), B28 (700 MHz), B38 (TDD 2600 MHz), B40 (TDD 2300 MHz), B41 (2500 MHz)
Antenna	Internal antenna
SIM card	Nano SIM
Security	3GPP TS 33.401

WI-FI

IEEE standards supported	802.11 a, b, g, n, ac
Wi-Fi bands	2.4 GHz and 5 GHz
Authentication and encryption	• WPA • WPA2 • WPA2 Enterprise (EAP-TLS) • WPA3 • WPA3 Enterprise

BLUETOOTH

Bluetooth versions supported	Bluetooth 5.3, 5.2, 5.1, 5.0, 4.2, 4.1, 4.0, and 2.1 + EDR
Bluetooth range	• Bluetooth power: Class 2 • Line of sight range is 10 m
Bluetooth security	• With secure connections (used in security mode 4, level 4 as recommended by NIST) • Supports Advanced Encryption Standard (AES) algorithm, with 128 bit key length • Also uses an algorithm for bluetooth key generation and key authentication
Bluetooth audio profiles	• Headset Profile (HSP) • Serial Port Profile (SPP) • Generic Access Profile • Generic Attributes Profile (GATT) including heart rate profile, battery service profile, devices information profile

NFC

Tag type	ISO/IEC 15693

RFID

Tag type	866-868 MHz or 902-928 MHz

TETRA ANTENNA

Connector	SMA
Impedance	50 Ω
Car kit	N/A

[1] Recommended for low temperature environments

TETRA SERVICES

RF

Frequency bands	350-470 MHz
Transmitter RF power	• Class 3 (2.8 W) • Class 3L (1.8 W) • Class 4 (1 W)
Adaptive RF power control	Per EN 300 392-2
Receiver class	A and B
Receiver static sensitivity	-116 dBm (guaranteed), -118 dBm (typical)
Receiver dynamic sensitivity	-107 dBm (guaranteed), -109 dBm (typical)

SECURITY

Air interface encryption authentication	Infrastructure initiated and made mutual by radio terminal
Air interface encryption - algorithms	• TEA 1 • TEA 2 • TEA 3 (Hardware ready for TEA 5, TEA 6, TEA 7 and dual encryption)
Air interface encryption protocols - security classes	• Class 1 (Clear) • Class 2 (SCK, OTAR-SCK) • Class 3 (DCK/CCK, OTAR-CCK, OTAR-SCK) • Class 3G (GCK, OTAR-GCK)
End-to-end encryption (E2EE)	AES 128 or AES 256 for voice and short data with OTAK supported via optional Hardware Security Module (HSM)
User access control	• PIN/PUK code access • Radio User Assignment (RUA) / Radio User Identity (RUI) authentication restricts radio users to pre-installed service profile capabilities. • Setup for forwarding of calls and SDS from permanent radio to the currently assigned radio. • Users can be reached (called, sent SDS) at their permanent radio number (P-ISSI) even if they are logged on to a different radio. • RUA/RUI are not supported when E2EE is enabled.
LTE and Wi-Fi security	Built-in firewall: • Secures inbound IP traffic, by restricting it to the channel initiated by MXP660. • No open TCP/UDP sockets
Other security features	• Temporary disable (stun) • Permanent disable[2] (ETSI standard) • Packet data user authentication

DATA

Short data	• Status: ○ 400 entries, send via One-Touch Button or menu ○ TMO and DMO • SDS: ○ Concatenation up to 1000 characters ○ TMO and DMO • Callout (simple, full, E2EE) • Access to SDS during an emergency call • Target address: sent to individual or group address (selected or dedicated) • SDS messages can be sent and received during a call
Packet data	Multi-Slot Packet Data: Data transmission with up to 4 slots supporting up to 28.8 kbit/s in total
PEI (Peripheral Equipment Interface)	• TNP1: Simultaneous operation of Packet Data and Short Data Services over a common Peripheral Equipment Interface (PEI) • AT Commands: full set of ETSI and Enhanced Commands • AT multiplexer: 4 virtual physical port (simultaneous PD, SDS, AT Commands and Air Tracer Sessions)
Expandable memory	Up to 32 GB with a micro SD or micro SDHC card

TETRA SERVICES (CONTINUED)

VOICE

Full duplex	TMO: private, PABX, PSTN, emergency
Half duplex	• TMO: private, group, emergency • DMO: private, group, emergency
Emergency call (user customisable)	• Tactical: emergency group call to attached talkgroup • Non-tactical: emergency group call to dedicated talkgroup • Individual: emergency call to pre-defined party (half/full duplex) • Hot Mic: allows user to talk without needing to press PTT button • Smart emergency: TMO to DMO and DMO to TMO automatic switching options • Emergency alert • Emergency status message to dispatch console • Location: location (GNSS) is sent with emergency • Target address: sent to individual or group address (selected or dedicated) • Alarm (status message): emergency status (or other predefined status)
Other voice functions	• Inter-MNI • Call via gateway • Call via repeater • PTT double push • Pre-emptive priority calls • Phone book: 1000 persons, 6 numbers per each, 2000 maximum entry • Scanning: 40 lists of 20 talkgroups, monitoring 20 groups at the same time (selected talkgroup and passive monitoring) • Announcement Talkgroup: 1 primary talkgroup that can monitor other talkgroups
DGNA	Up to 10000 groups

DMO REPEATER

DMO repeater mode features and functions	• ETSI type 1A DMO repeater for channel efficient operation • Repeats DMO voice and tone signalling on selected talkgroup • Repeats SDS and status messaging on selected talkgroup • Transmission of repeater presence signal • Emergency call (Pre-emptive priority call) • Monitoring of and participation in calls whilst in repeater mode

DIMETRA CONNECT (TETRA OVER IP)

Supported networks	Supports DIMETRA Connect[3] over LTE and Wi-Fi
DIMETRA Connect security	• Certificate based authentication between radio and DIMETRA Connect gateway • 256-bit AES encryption over IP between radio and DIMETRA Connect gateway • Maintains TETRA authentication, TETRA end-to-end encryption, TETRA temporary/permanent disable over LTE and Wi-Fi • TLS 1.3 for DIMETRA Connect over Wi-Fi and LTE

DEVICE MANAGEMENT SOLUTIONS

Customer Programming Software (CPS)	Supports CPS version 8.3 onwards
Integrated Terminal Management (iTM)	Supports iTM version 8.3 onwards
Over-the-air updates / programming	• LTE: Supports OTA-updates / programming for firmware and configuration (codeplug) via LTE[4] • Wi-Fi: Supports OTA-updates / programming for firmware and configuration (codeplug) via Wi-Fi[4] • TETRA: Supports OTA-programming for selected configuration (codeplug) information via TETRA network[4]
OTAP security	TLS 1.2 for OTAP over LTE and Wi-Fi

[2] Two options: customer restorable, or only restoreable by Motorola Solutions.

[3] For more information about DIMETRA Connect, visit: **motorolasolutions.com/dimetraconnect**

[4] Requires Integrated Terminal Management (iTM) software.

LOCATION SERVICES

SATELLITE / OUTDOOR NAVIGATION SERVICE

Constellations supported	GPS plus one of: Galileo, GLONASS, or BeiDou, Satellite-Based Augmentation Systems (SBAS) including QZSS		
GNSS antenna	Internal antenna		
GNSS tracking sensitivity	GPS: BDS (BeiDou): GLONASS: Galileo:	-163 dBm (guaranteed); -155 dBm (guaranteed); -157 dBm (guaranteed); -155 dBm (guaranteed);	-164 dBm (typical) -156 dBm (typical) -160 dBm (typical) -157 dBm (typical)
Horizontal accuracy, 2D	1.0 m (95% probable, -130 dBm, >15 SVs Galileo and GPS)		
TTFF cold start	<60 sec (95% probable at -130 dBm)		
Protocols	• ETSI LIP (Short and Long) • Motorola Solutions LRRP		

INDOOR NAVIGATION SERVICE

BTLE indoor location	iBeacon™ / Bluetooth low energy beacon
Protocols	ETSI LIP (extended)

RECOMMENDED SERVICES

Services for TETRA radios	3 years of Essential Software services are included as standard. Additional services are available. Visit: **motorolasolutions.com/mxp660**

ENVIRONMENTAL SPECIFICATIONS

Operating temperature[5]	-30 to +70 °C
Storage temperature	-40 to +85 °C
Humidity (condensation and high), temperature change, low and high temperature	ETSI 300 019-1-7 class 7.3E
Shock (bumps and shock), drop (free fall, drop and topple) and vibration (random and sine)	ETSI 300-019 1-7 class 5M3
Dust and water ingress protection	IP68 (2 m, 2 hr), IP67, IP66, IP65 per IEC 60529
Lab accreditation	ISO/IEC 17025:2017

US MILITARY STANDARD MATRIX

	MIL-STD 810 C		MIL-STD 810 D		MIL-STD 810 E		MIL-STD 810 F		MIL-STD 810 G		MIL-STD 810 H	
Applicable MIL-STD	**Method**	**Proc/Cat**	**Method**	**Proc/Cat**	**Method**	**Proc/Cat**	**Method**	**Proc/Cat**	**Method**	**Proc/Cat**	**Method**	**Proc/Cat**
Low pressure	500.1	I	500.2	II	500.3	II	500.4	II	500.6	II	500.6	II
High temperature	501.1	I, II	501.2	I/A1, II/A1	501.3	I/A1, II/A1	501.4	I/Hot, II/Hot	501.6	I/A1, II/A1	501.7	I/A1, II/A1
Low temperature	502.1	I	502.2	I, II	502.3	I, II	502.4	I, II	502.6	I, II	502.7	I, II
Temperature shock	503.1	I	503.2	A1/C3	503.3	A1/C3	503.4	I	503.6	I-C	503.7	I-C
Solar radiation	505.1	II	505.2	I/A1	505.3	I/A1	505.4	I/A1	505.6	I/A1	505.7	I/A1
Rain	506.1	I, II	506.2	I, II	506.3	I, II	506.4	I, III	506.6	I, III	506.6	I, III
Humidity	507.1	II	507.2	II	507.3	II	507.4	Yes	507.6	II/ Aggravated	507.6	II/ Aggravated
Salt fog	509.1	I	509.2	I	509.3	I	509.4	Yes	509.6	Yes	509.7	Yes
Blowing dust and sand	510.1	I	510.2	I, II	510.3	I, II	510.4	I, II	510.6	I, II	510.7	I, II
Vibration	514.2	VIII/CatF, XI	514.3	I/Cat10, II/Cat3	514.4	I/Cat10, II/Cat3	514.5	I/Cat24, II/Cat5	514.7	I/Cat24, II/Cat5	514.8	I/Cat24, II/Cat5
Shock	516.2	I,III, V	516.3	I, V, VI	516.4	I, V, VI	516.5	I, V, VI	516.7	I, V, VI	516.8	I, V, VI

[5] Performance may be limited when operating at extreme temperatures.

Note: Some features mentioned are optional, and some require additional software licences. Please check with your local Motorola Solutions representative for full details.

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Tecnitrān
TELECOMUNICACIONES
916 106 678 | info@tecnitran.es | www.tecnitran.es
Madrid | Valencia | Mallorca