**MISSION READY WHEN IT MATTERS MOST**

# APX™ 4000 PROJECT 25 PORTABLE RADIO

Chemical spill. Catastrophic storm. Power outage. When every minute matters, you must communicate instantly with other agencies and responders. But how do you prepare for a disaster and keep control of operating costs? That's where the APX 4000 P25 portable radio answers the call, expertly and affordably.

The APX 4000 delivers all the benefits of TDMA technology in the smallest P25 capable portable in the industry. Easy to use, tough as nails, a hard value to beat, it seamlessly connects agencies throughout your city for fast, interoperable communications.

## TRUSTED APX QUALITY

The APX 4000 leverages the leading attributes of the APX family of P25 TDMA portables. From the 2-microphone design that reduces background noise so you can speak and hear clearly over heavy equipment, diesel engines and sirens to the high-spec RF performance for excellent coverage in challenging environments.

With its easy-to-use interface, color display, intelligent lighting and radio profiles, you get all the power of APX in a compact radio. Plus, you can extend the performance of your radio with a complete portfolio of industry-leading IMPRES™ smart energy and audio accessories.

## COMPACT AND UNCOMPROMISING

A compact P25 Phase 2 capable portable, the APX 4000 gets the job done without getting in the way. With two dedicated knobs for volume and channel control, the APX 4000 provides readiness for any type of work setting. And its standard IP67 and MIL-STD certified to withstand dust, heat, shock, drops and water immersion, so you can count on it wherever you need it – at the factory line, power line or fire line.

## P25 PERFORMANCE, INSIDE AND OUT

Loaded with key P25 features to increase safety, the APX 4000 features Mission Critical Wireless. This unique Bluetooth® solution provides an encrypted link to a high performance earpiece, GPS for quickly locating personnel outdoors, 256-bit AES encryption for improved security, and over-the-air programming to program radios in the field without interrupting voice operation.

## IMPROVE RESPONSE AND EXPENSES

The APX 4000 is P25 Phase 2 capable for twice the voice capacity so you can add more users without adding more frequencies or infrastructure. And it's backwards and forwards compatible with all Motorola mission critical radio systems, so you can interoperate with confidence while you improve operating expenses.

## POWER UP WITH APX 4000 ACCESSORIES

- Designed, tested and certified for optimum performance with your radio.
- Complete portfolio of remote speaker microphones, headsets and Mission Critical Wireless Bluetooth® accessories.
- High-powered IMPRES™ batteries that have a slim design to fit the compact radio size.


## FEATURES AND BENEFITS

Available in 700/800 MHz, VHF, UHF R1, UHF R2 and 900 MHz bands

- Trunking standards supported:
  - Clear or digital encrypted ASTRO®25 Trunked Operation
  - Capable of SmartZone®, SmartZone Omnilink, SmartNet®
- Analog MDC-1200 and Digital APCO P25 Conventional
- System Configurations
- Narrow and wide bandwidth digital receiver (6.25 kHz equivalent / 12.5 kHz / 30 kHz / 25 kHz)[1]
- Standard with 2 dedicated control knobs for volume and channel changes
- Embedded digital signaling (ASTRO & ASTRO 25)
- Man Down
- Available in 2 models
- Lightbar with Intelligent Lighting
- Radio Profiles
- Unified Call List
- Software Key
- ASTRO 25 Integrated Voice & Data
- User programmable Voice Announcement
- Meets Applicable MIL-STD-810C, D, E, F and G
- IP67 standard
- Rugged Submersible housing (2 meters for 2 hours)[2]
- Superior Audio Features:
  - 0.5 W high audio speaker
  - 2-mic noise canceling technolog
- GPS Outdoor Location Tracking
- Utilizes Windows XP, Vista and Windows 7 and 8 Customer Programming Software (CPS)
  - Supports USB communications
  - Built in FLASHport™ support
- Full portfolio of accessories including IMPRES batteries, chargers and audio devices[1]
- Mission Critical Wireless Bluetooth[2]

## OPTIONAL FEATURES

- 256-bit AES Encryption
- Programming Over Project 25
- Text Messaging
- Man Down
- Site Selectable Alert Tones
- P25 Link Layer Authentication
- Enhanced Data
- Rugged Option: Mil Std 512.X, Delta - T

[1] Chargers and batteries for the APX 4000 radios are not compatible with other APX radios.
[2] Compatible with BT 2.1 HSP, PAN, DUN and SPP BT Profiles.
[3] When used with a Hazardous Location tested radio.

## TRANSMITTER - TYPICAL PERFORMANCE SPECIFICATIONS

| | | 700/800 | VHF | UHF Range 1 | UHF Range 2 | 900 MHz[6] |
|---|---|---|---|---|---|---|
| Frequency Range/ Bandsplits | 700 MHz<br>800 MHz | 763-776, 793-806 MHz<br>806-824, 851-870 MHz | 136-174 MHz | 380-470 MHz | 450-520 MHz | 896-901, 935-940 MHz |
| Channel Spacing | | 25/12.5 kHz | 30/25/12.5 kHz | 25/12.5 kHz | 25/12.5 kHz | 12.5 kHz |
| Maximum Frequency Separation | | Full Bandsplit | Full Bandsplit | Full Bandsplit | Full Bandsplit | Full Bandsplit |
| Rated RF Output Power Adj[1] | | 1-3 Watts Max | 1-5 Watts Max | 1-5 Watts Max | 1-5 Watts Max | 1-2.5 Watts Max |
| Frequency Stability[1] (-30°C to +60°C; +25°C Ref.) | | ±0.00010 % | ±0.00010 % | ±0.00010 % | ±0.00010 % | ±0.00010 % |
| Modulation Limiting[1] | | ±5 kHz / ±4 kHz / ±2.5 kHz | ±5 kHz / ±4 kHz / ±2.5 kHz | ±5 kHz / ±4 kHz / ±2.5 kHz | ±5 kHz / ±4 kHz / ±2.5 kHz | ±2.5 kHz |
| Emissions (Conducted and Radiated)[1] | | -75 dB | -75 dB | -75 dB | -75 dB | -75 dB |
| Audio Response[1] | | +1, -3 dB | +1, -3 dB | +1, -3 dB | +1, -3 dB | +1, -3 dB |
| FM Hum & Noise | 25 kHz<br>12.5 kHz | -47 dB<br>-45 dB | -47 dB<br>-47 dB | -47 dB<br>-45 dB | -47 dB<br>-45 dB | -45 dB |
| Audio Distortion[1] | 25 kHz<br>12.5 kHz | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% |

## BATTERIES FOR APX 4000

| Battery Capacity / Type | Dimensions (HxWxD) | Weight | Battery Part Number | Battery Capacity |
|---|---|---|---|---|
| Li-Ion IMPRES 1900 mAh IP67 | 114.5x55.04x17.85 | 150 grams | NNTN8128A | 1900 mAh |
| Li-Ion IMPRES 2300 mAh IP67 Non-HazLoc | 114.5x55.04x23.15 | 160 grams | PMNN4424AR | 2300 mAh |
| Li-Ion IMPRES 2300 mAh IP67 HazLoc[3] | 114.5x55.04x23.15 | 210 grams | NNTN8560A | 2500 mAh |
| Li-Ion IMPRES 2700 mAh IP54 Non-HazLoc[3] | 114.5 x 55.04 x 23.15 | 160 grams | PMNN4448AR | 2700 mAh |

**PRODUCT DATA SHEET**
APX™ 4000

## RADIO MODELS

| | MODEL 2 | MODEL 3 |
|---|---|---|
| Display | Full bitmap color LCD display<br>3 lines of text x 14 characters<br>1 line of icons<br>1 menu line x 3 menus<br>White backlight | Full bitmap color LCD display<br>3 lines of text x 14 characters<br>1 line of icons<br>1 menu line x 3 menus<br>White backlight |
| Keypad | Backlight keypad<br>3 soft keys<br>4 direction Navigation key<br>Home and Data buttons | Backlight keypad<br>3 soft keys<br>4 direction navigation key<br>4x3 keypad<br>Home and Data buttons |
| Channel Capacity | 512 | 512 |
| FLASHport Memory | 64 MB | 64 MB |
| 700/800 MHz (763-870 MHz) | H51UCF9PW6AN Q360GK | H51UCH9PW7AN Q360GK |
| VHF (136-174 MHz) | H51KDF9PW6AN Q360GX | H51KDH9PW7AN Q360GX |
| UHF Range 1 (380-470 MHz) | H51QDF9PW6AN Q360GL | H51QDH9PW7AN Q360GL |
| UHF Range 2 (450-520 MHz) | H51SDF9PW6AN Q360HA | H51SDH9PW7AN Q360HA |
| 900 MHz (896-940 MHz) | H51WCF9PW6AN Q360JF | H51WCH9PW7AN Q360JE |
| Buttons & Switches | Large PTT button ■ Angled On/Off Volume Control ■ 16 position top-mounted rotary switch ■ Orange emergency button ■ 3 programmable side buttons | |

### TRANSMITTER CERTIFICATION

| | |
|---|---|
| 700/800 (764-869 MHz) | AZ489FT7049 |
| VHF (136-174 MHz) | AZ489FT3828 |
| UHF Range 1 (380-470 MHz) | AZ489FT4905 |
| UHF Range 2 (450-520 MHz) | AZ489FT4910 |
| 900 MHz (896-901, 935-940 MHz) | AZ489FT5864 |

### FCC EMISSIONS DESIGNATORS

| | |
|---|---|
| FCC Emissions Designators | 11K0F3E, 16K0F3E, 8K10F1D, 8K10F1E, 8K10F1W, 20K0F1E* |
| FCC Emissions Designators for 900 MHz | 11K0F3E, 8K10F1D, 8K10F1E, 8K10F1W |

### POWER SUPPLY

| | |
|---|---|
| Power Supply | One rechargeable Li-Ion 1900 mAh battery standard, or 2300 mAh/2700 mAh high cap Li-Ion. |

## RECEIVER - TYPICAL PERFORMANCE SPECIFICATIONS

| | | 700/800 | VHF | UHF Range 1 | UHF Range 2 | 900 MHz |
|---|---|---|---|---|---|---|
| Frequency Range/Bandsplits | 700 MHz<br>800 MHz | 763-776 MHz<br>851-870 MHz | 136-174 MHz | 380-470 MHz | 450-520 MHz | 935-940 MHz |
| Channel Spacing | | 25/12.5 kHz | 30/25/12.5 kHz | 25/12.5 kHz | 25/12.5 kHz | 12.5 kHz |
| Maximum Frequency Separation | | Full Bandsplit | Full Bandsplit | Full Bandsplit | Full Bandsplit | Full Bandsplit |
| Audio Output Power at Rated[1] | | 500mW | 500mW | 500mW | 500mW | 500mW |
| Frequency Stability[1]<br>(-30°C to +60°C; +25°C Ref.) | | ±0.00010 % | ±0.00010 % | ±0.00010 % | ±0.00010 % | ±0.00010 % |
| Analog Sensitivity[3]<br>Digital Sensitivity[4] | 12 dB SINAD<br>1% BER (800 MHz)<br>5% BER | 0.250µV<br>0.400µV<br>0.250µV | 0.216µV<br>0.277µV<br>0.188µV | 0.234µV<br>0.307µV<br>0.207µV | 0.234µV<br>0.307µV<br>0.207µV | 0.236µV<br>0.33µV<br>0.222µV |
| Selectivity[1] | 25 kHz channel<br>12.5 kHz channel | -76 dB<br>-67 dB | -76 dB<br>-70 dB | -76 dB<br>-67 dB | -76 dB<br>-67 dB | -67 dB |
| Intermodulation | | -75 dB | -79 dB | -77 dB | -77 dB | -75 dB |
| Spurious Rejection | | -76.6 dB | -80.5 dB | -80.3 dB | -80.3 dB | -80 dB |
| FM Hum and Noise | 25 kHz<br>12.5 kHz | -53 dB<br>-47 dB | -51 dB<br>-45 dB | -50 dB<br>-45 dB | -50 dB<br>-45 dB | -47 dB |
| Audio Distortion[1] | | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% |

## PORTABLE MILITARY STANDARDS 810 C, D, E , F & G

| | MIL-STD 810C | | MIL-STD 810D | | MIL-STD 810E | | MIL-STD 810F | | MIL-STD 810G | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 500.5 | II |
| High Temperature | 501.1 | I, II | 501.2 | I/A1, II/A1 | 501.3 | I/A1, II/A1 | 501.4 | I/Hot, II/Basic Hot | 501.5 | I/A1, II/A2 |
| Low Temperature | 502.1 | I | 502.2 | I/C3, II/C1 | 502.3 | I/C3, II/C1 | 502.4 | I/C3, II/C1 | 502.5 | I/C3, II/C1 |
| Temperature Shock | 503.1 | I | 503.2 | I/A1C3 | 503.3 | I/A1C3 | 503.4 | I | 503.5 | I/C |
| Solar Radiation | 505.1 | II | 505.2 | I | 505.3 | I | 505.4 | I | 505.5 | I/A1 |
| Rain | 506.1 | I, II | 506.2 | I, II | 506.3 | I, II | 506.4 | I, III | 506.5 | I, III |
| Humidity | 507.1 | II | 507.2 | II | 507.3 | II | 507.4 | 1 Proc | 507.5 | II/Aggravated |
| Salt Fog | 509.1 | I | 509.2 | I | 509.3 | I | 509.4 | 1 Proc | 509.5 | 1 Proc |
| Blowing Dust | 510.1 | I | 510.2 | I | 510.3 | I | 510.4 | I | 510.5 | I |
| Blowing Sand | 1 Proc | 1 Proc | 510.2 | II | 510.3 | II | 510.4 | II | 510.5 | II |
| Vibration | 514.2 | VIII/F, Curve-W | 514.3 | I/10, II/3 | 514.4 | I/10, II/3 | 514.5 | I/24 | 514.6 | I/24 |
| Shock | 516.2 | I, III, V | 516.3 | I, V, VI | 516.4 | I, V, VI | 516.5 | I, V, VI | 516.6 | I, V, VI |
| Shock (Drop) | 516.2 | II | 516.2 | IV | 516.4 | IV | 516.5 | IV | 516.6 | IV |

## DIMENSIONS OF THE RADIOS WITHOUT BATTERY

| | Inches | Millimeters |
|---|---|---|
| Length | 5.42 | 137.7 |
| Width Push-To-Talk button | 2.42 | 61.4 |
| Depth Push-To-Talk button | 1.41 | 35.75 |
| Width Top | 2.62 | 66.55 |
| Depth Top | 1.84 | 46.7 |
| Weight of the radios without battery | 10.05 oz | 285 g |

## GPS SPECIFICATIONS

| | |
|---|---|
| Channels | 12 |
| Tracking Sensitivity | –159 dBm |
| Accuracy[5] | <10 meters (95%) |
| Cold Start | <60 seconds (95%) |
| Hot Start | <10 seconds (95%) |
| Mode of Operation | Autonomous (Non-Assisted) GPS |

## ENCRYPTION

| | |
|---|---|
| Supported Encryption Algorithms | 256-bit AES, ADP |
| Encryption Algorithm Capacity | 8 |
| Encryption Keys per Radio | Module capable of storing 1024 keys.<br>Programmable for 48 Common Key Reference (CKR) or<br>16 Physical Identifier (PID) |
| Encryption Frame Re-sync Interval | P25 CAI 300 mSec |
| Encryption Keying | Key Loader |
| Synchronization | XL – Counter Addressing<br>OFB – Output Feedback |
| Vector Generator | National Institute of Standards and Technology<br>(NIST) approved random number generator |
| Encryption Type | Digital |
| Key Storage | Tamper protected volatile or non-volatile memory |
| Key Erasure | Keyboard command and tamper detection |
| Standards | FIPS 140-2 Level 3; FIPS 197 |

## ENVIRONMENTAL SPECIFICATIONS

| | |
|---|---|
| Operating Temperature[6] | -30°C / +60°C |
| Storage Temperature[6] | -40°C / +85°C |
| Humidity | Per MIL-STD |
| ESD | IEC 801-2 KV |
| Water and Dust Intrusion | IP67 |
| Submersion | MIL-STD 512.X |

[1] Measured in the analog mode per TIA / EIA 603 under nominal conditions
[2] When used with an UL approved intrinsically safe radio
[3] Measured conductively in analog mode per TIA / EIA 603 under nominal conditions.
[4] Measured conductively in digital mode per TIA / EIA IS 102.CAAA under nominal conditions.
[5] Accuracy specs are for long-term tracking (95th percentile values >5 satellites visible at a nominal –130 dBm signal strength).
[6] Temperatures listed are for radio specifications. Battery storage is recommended at 25°C, ±5°C to ensure best performance.

Specifications subject to change without notice. All specifications shown are typical. Radio meets applicable regulatory requirements.

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