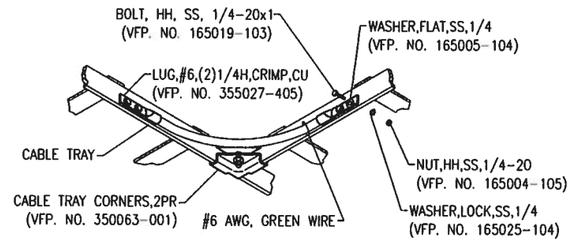
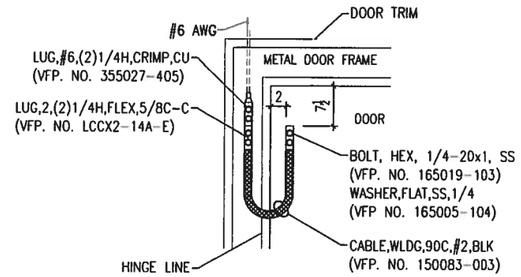
NOTES

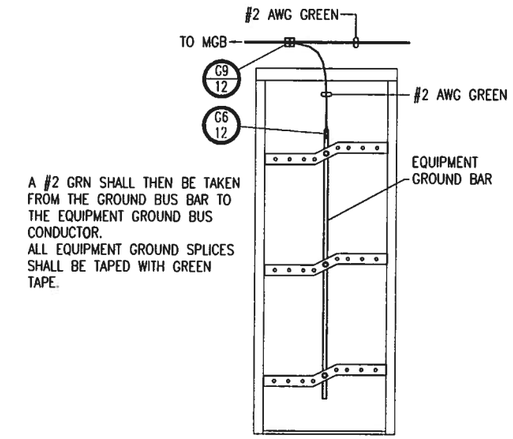
1. THE RADIUS OF ANY BOND SHALL NOT BE LESS THAN 8"
2. THE ANGLE OF ANY BOND SHALL NOT BE LESS THAN 90°
3. COMPRESSION SYSTEMS SHALL INCLUDE CRIMPED DIE INDEX AND COMPANY LOGO FOR PURPOSES OF INSPECTION
4. LISTED TWO-HOLE, LONG BARREL, COMPRESSION LUGS ARE PREFERRED OVER SINGLE-HOLE LUGS AND SHALL BE REQUIRED WHERE TWO-HOLE LUGS ARE REFERENCED IN R56.
5. ANTI-OX (NO-OX) SHALL BE APPLIED TO ALL CONNECTIONS OF DISSIMILAR METALS.
6. COPPER ENHANCED ANTI-OXIDANT COMPOUND (KOPR-SHIELD) SHOULD BE USED BETWEEN COPPER, BRASS, BRONZE, AND TIN-PLATED BONDING SURFACES.
7. WHERE THREADED HOLES ARE PROVIDED FOR ATTACHMENT PURPOSES, A STAR OR SPLIT TYPE LOCK WASHER SHALL BE INSTALLED UNDER THE HEAD OF THE SCREW OR BOLT AND/OR BETWEEN THE NUT AND THE GROUND BUS BAR.
8. SELF-TAPPING SCREWS SHALL NOT BE USED



G1 CABLE LADDER BOND
(STANDARD 1-1/2" RAIL)

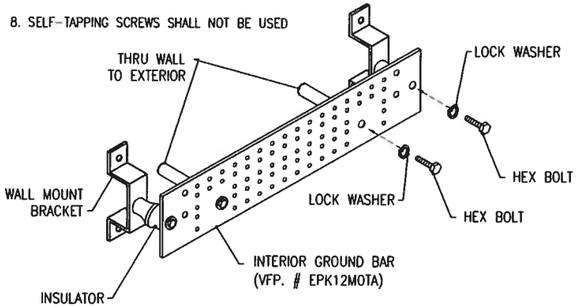


G2 DOOR BONDING STRAP
install on exterior doors

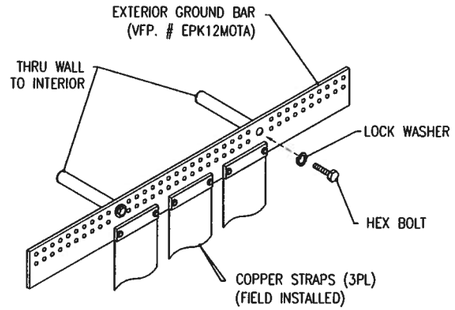


A #2 GRN SHALL THEN BE TAKEN FROM THE GROUND BUS BAR TO THE EQUIPMENT GROUND BUS CONDUCTOR.
ALL EQUIPMENT GROUND SPLICES SHALL BE TAPED WITH GREEN TAPE.

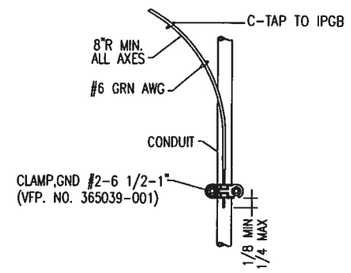
E1 EQUIPMENT GROUNDING ELEVATION EXAMPLE
REFER TO ONLY WHEN EQUIPMENT IS INSTALLED
VIEWED FROM REAR OF EQUIPMENT



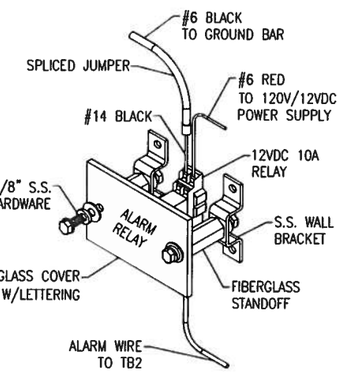
G3 MAIN GROUND BAR INSTALLATION-INTERIOR
SEE DETAIL 'G4' FOR EXTERIOR GROUND BAR INSTALLATION



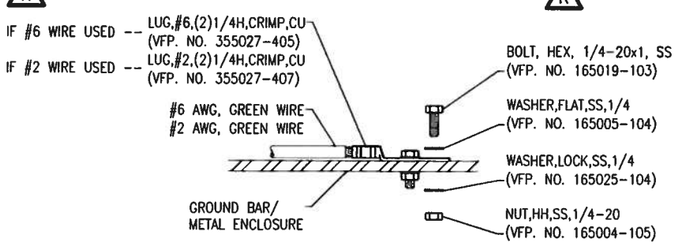
G4 MAIN GROUND BAR INSTALLATION-EXTERIOR
SEE DETAIL 'G11' FOR COPPER STRAP & COVER INSTALLATION DETAIL



G5 CONDUIT BOND
SEE DETAIL 'G8' & 'G9' FOR C-TAP DETAIL



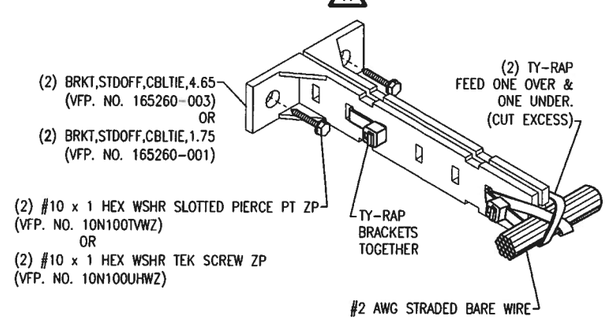
G12 GROUND BAR ALARM ASSEMBLY



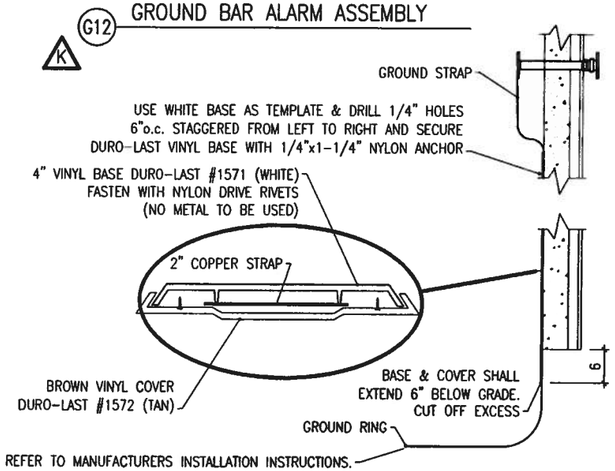
Installation Notes

a. select bolt length to provide a minimum of two exposed threads.
b. burnish mounting surface to remove paint in the area of lug contact.
c. apply anti-oxidant compound to mating surface of lug and wipe clean excess compound.
d. use solid copper wire and mechanical 2-hole lug for all exterior grounding.
e. Stainless hardware only.

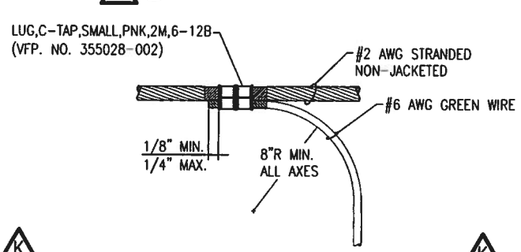
G6 GROUNDING CONNECTION
SEE NOTES 5 & 6



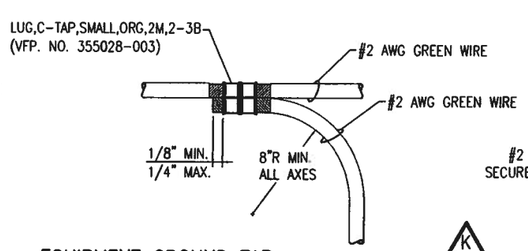
G7 IPGB GROUND INSTALLATION
screw to interior wall @ 16" O.C. MAX



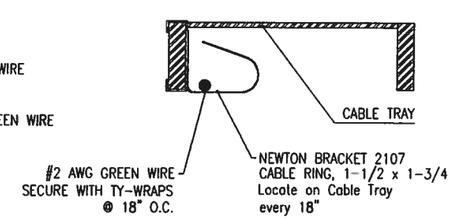
G11 GROUND BAR/STRAP/COVER DETAIL



G8 IPGB RING GROUND TAP



G9 EQUIPMENT GROUND TAP



G10 NEWTON BRACKET PLACED ON INTERIOR OF CL W/ GROUND INSTALLATION

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TTW	SRS	4/7/05	C
UPDATES			
TKL	WEC	06/16/08	G
UPDATE DETAIL G5 AND G6			
TJS	[illegible]	06/24/13	K
UPDATE ENTIRE PRINT			

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CHECKED BY S.R.SHUMATE	DATE 09/10/02
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SIZE B / CAGE NO 53223	REV K
SCALE 1/4"=1'0"	MODEL 2506

TITLE
11'8"x32'0"x9'2" CONC
MOTOROLA STANDARDS
GROUNDING DETAILS

DRAWING NO. 202506

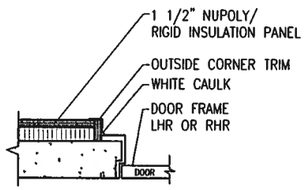
SHEET 12 OF 15

FINISHING NOTES

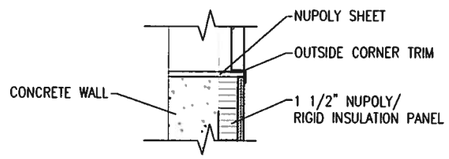
a. Refer to Fastening Schedule Drawing #101562.

b. Refer to manufacturing work order or sales order to verify interior and interior finish of building. Refer to detail 'D' this page for floor covering.

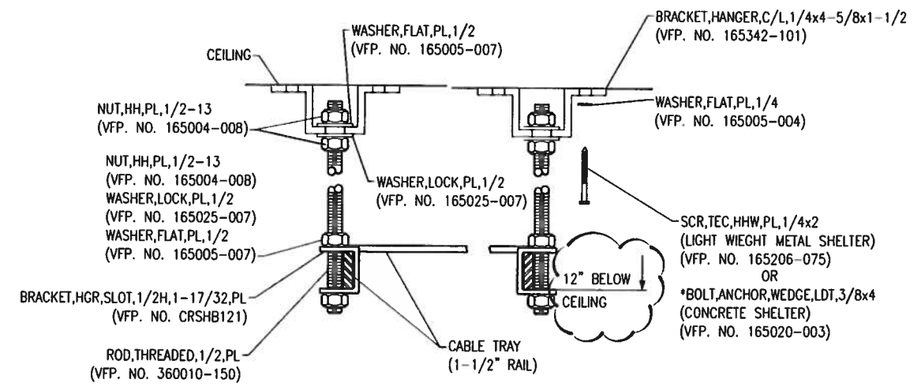
c. Refer to interior layout sheets before routing interior sheathing for miscellaneous openings.



A DOOR OPENING

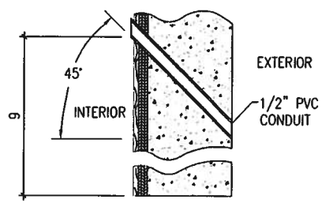


B WALL OPENING



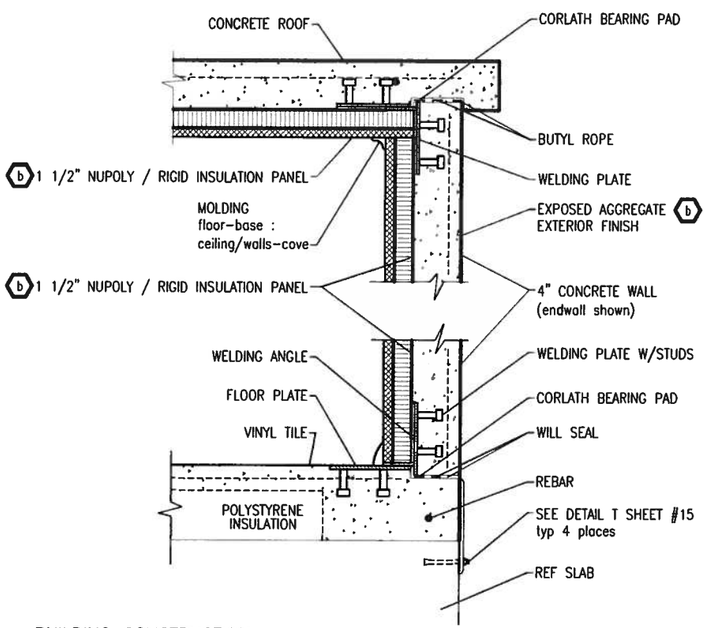
C HANGER INSTALLATION DETAIL

*(IF METAL OR CONCRETE CAN NOT BE HIT, USE BOLT,LAG,PL,3/8X1-1/2 (VFP. NO. 165000-012, MIN. 4 REQUIRED)



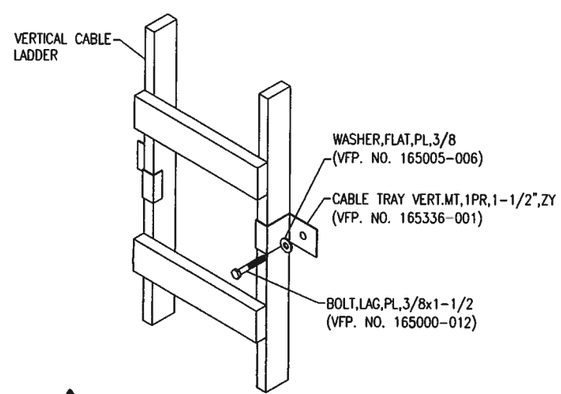
K

Q PVC NIPPLE INSTALLATION



D BUILDING CONSTRUCTION

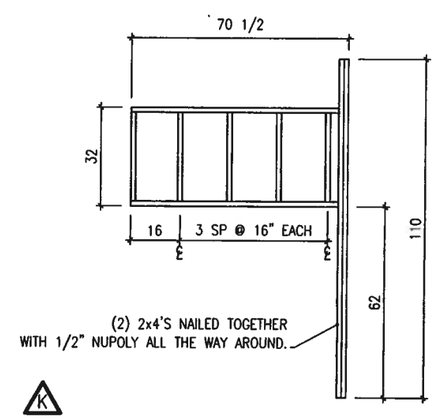
elevation cut-away



K

E CABLE LADDER WALL MOUNT INSTALLATION

(STANDARD 1-1/2" RAIL)



K

L HALF WALL -- FRAMING

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TJC	SRS	02/09/06	F
UPDATE DETAIL C			
TKL	WEC	06/16/08	G
UPDATE DETAIL A, B, AND C			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

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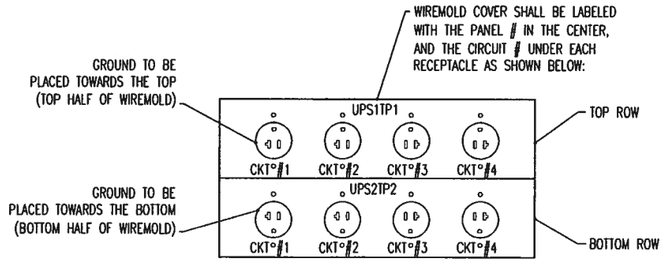
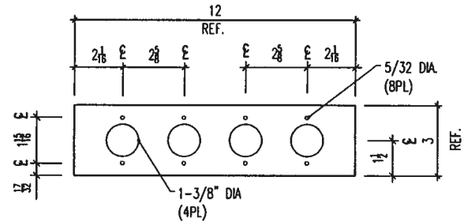
11'8"x32'0"x9'2" CONC
MOTOROLA STANDARDS
CONSTRUCTION DETAILS

DRAWING NO. 202506

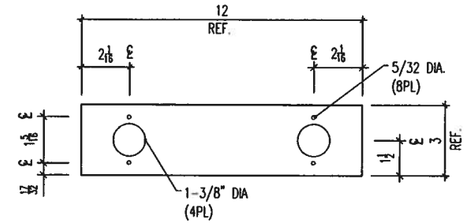
SHEET 13 OF 15



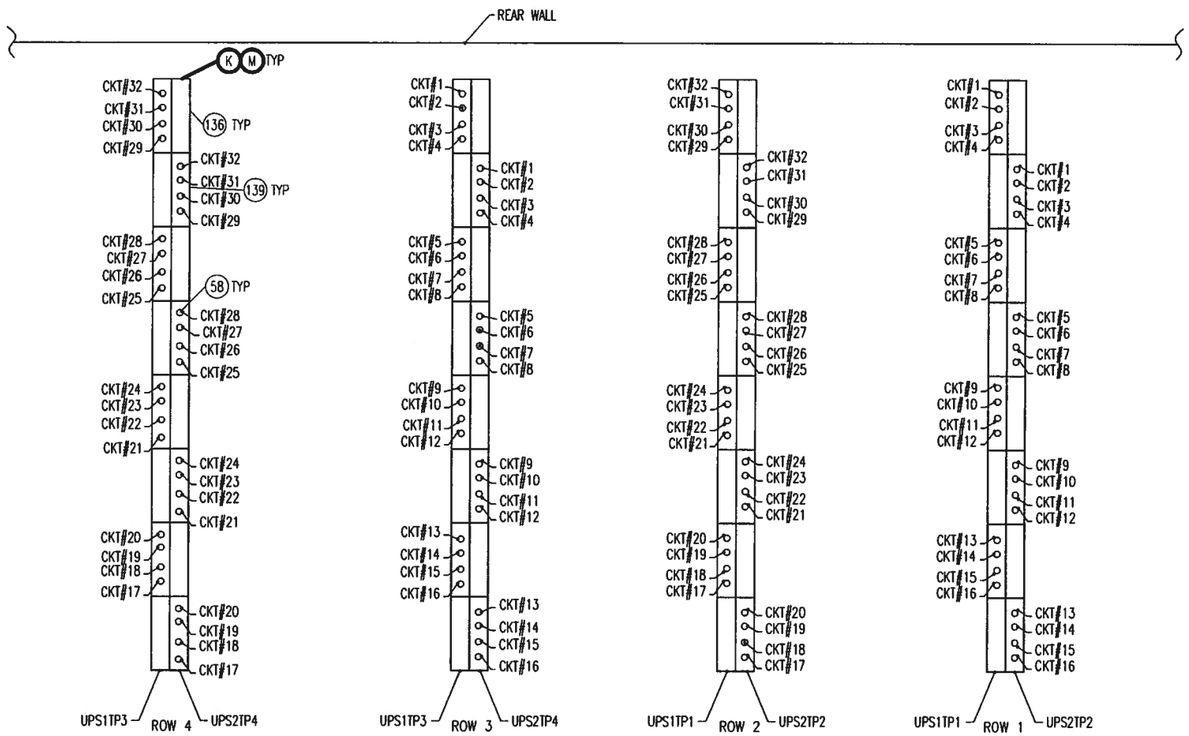
K SIMPLEX RECEPTACLE ORIENTATION



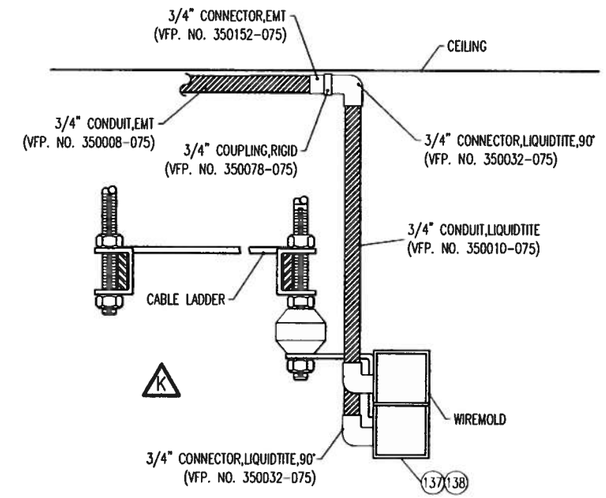
M WIREMOLD SIMPLEX COVER
(32 EA REQUIRED)



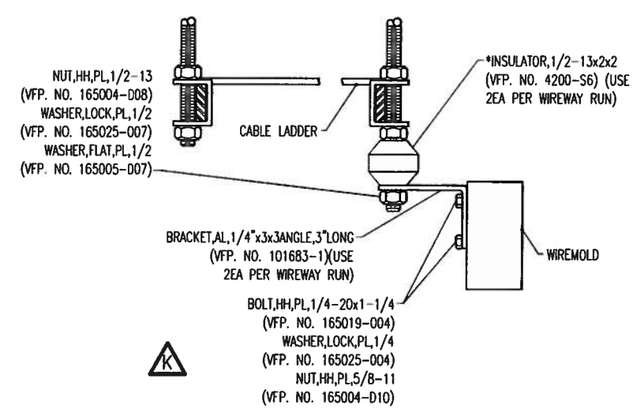
N WIREMOLD COVER
(2 EA REQUIRED)



J WIREMOLD CIRCUIT LOCATION
RECEPTACLES TO BE PLACED ON REAR SIDE OF EQUIPMENT
UPS1 CIRCUITS GO IN TOP OF WIREMOLD
UPS2 CIRCUITS GO IN BOTTOM OF WIREMOLD



P TYPICAL WIREMOLD CONNECTION
(DO NOT RUN CONDUITS THRU CABLE LADDER)
(CONDUIT SHALL LINE-UP WITH BLANK COVER PLATE.)



H WIREMOLD MOUNT TO CABLE LADDER
*(INSULATOR SHALL BE PLACED AS CLOSE TO CABLE LADDER AS POSSIBLE)

REVISIONS			
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TTW	SRS	4/7/05	C
UPDATES			
TKL	WEC	06/16/08	G
UPDATE TITLE BLOCK			
TJS	WEC	06/24/13	K
UPDATE ENTIRE PRINT			

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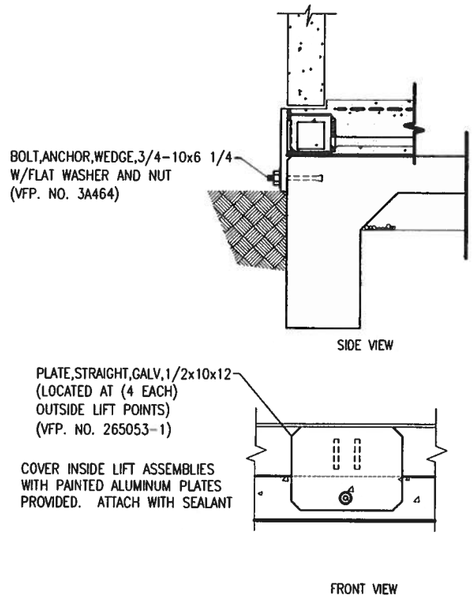
TITLE
11'8"x32'0"x9'2" CONC
MOTOROLA STANDARDS
WIREMOLD DETAILS

DRAWING NO. 202506

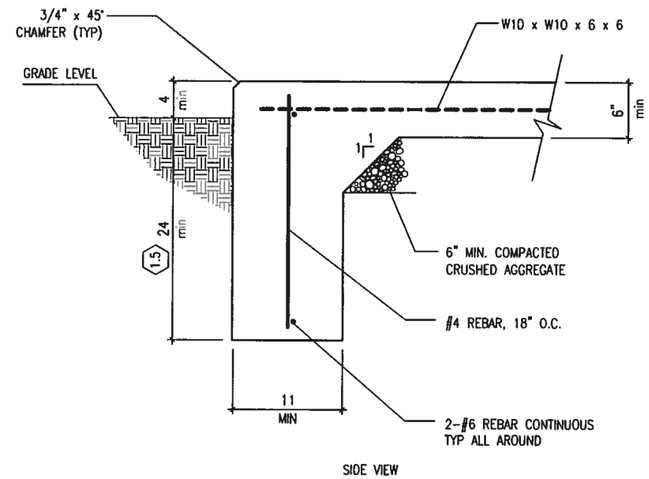
SHEET 14 OF 15

NOTES:

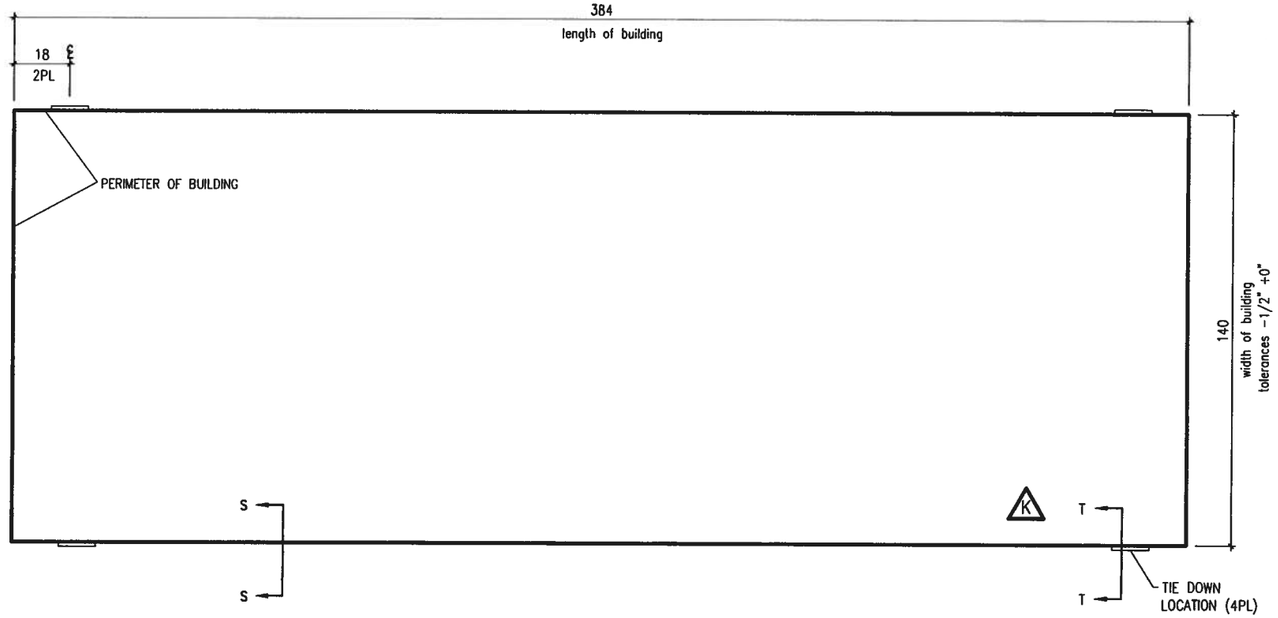
1. GENERAL
   - 1.1 All dimensions are specified in inches unless otherwise noted.
   - 1.2 Design and installation of foundation by local engineer or architect. This is only a suggested foundation plan.
   - 1.3 Foundation is designed for 2000 psf bearing. However, it is the customer's responsiblity to verify the adequacy of the foundation from soil boring data.
   - 1.4 Slab type foundation is not recommended for areas with extreme frost conditions or where high water tables are present. These conditions could cause differential settlements in the soil beneath the foundation resulting in structural cracks.
   - (1.5) Perimeter footing must be a minimum foundation depth of 24" or per local frost line on undistrubed soil.
   - 1.6 Locate wedge anchors after shelter is located on slab to correctly align with installed anchor plate.
2. MATERIAL
   - 2.1 Concrete shall have a minimum compressive strength of 3000 psi @ 28 days and shall be installed in accordance with the ACI-318 Building Code requirements for Reinforced Concrete.
   - 2.2 Reinforcing bars shall conform to ASTM-A65 grade 60 specifications and be detailed in accordance with ACI-318
   - 2.3 Test cylinders shall be molded and labortory cured in accordance with ASTM C31. Three cylinders shall be taken for each day's concrete placement. Cylinders shall be tested in accordance with ASTM C39.
3. TOLERANCES
   - 3.1 Tops of concrete foundation must be within 0.02"per foot of elevation specified by the customer.



K (T) BUILDING ATTACHMENT FIELD WORK
elevation cut away – from detail d



K (S) CONTINUOUS PERIMETER FOOTING FIELD WORK



(R) FOUNDATION PLAN FIELD WORK

QTY.	UNIT OF MEASURE	PART NO.	DESCRIPTION	ITEM NO.
4	EA	101536-1	COVER PLATE, ALUM. (PAINTED)	5
4	EA	265053-1	STRAIGHT PLATE CONNECTOR, 9 x 12 x 1/2	4
4	EA	165005-009	FLAT WASHER, 3/4	3
4	EA	165032-D02	HEX NUT, 3/4-10	2
4	EA	3A464	WEDGE ANCHOR, 3/4-10 x 6 1/4	1

REVISIONS

CHG. BY	APPR. BY	DATE	REV
TTW	SRS	4/7/05	C
UPDATES			
TKL	WEC	06/16/08	G
UPDATE TITLE BLOCK AND DTL L			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

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SCALE 1/4"=1'0"	MODEL 2506

TITLE
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MOTOROLA STANDARDS
FOUNDATION DETAILS

DRAWING NO. 202506

SHEET 15 OF 15

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 41 - Floodplain Information

RFP # 549

December 18, 2025

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Table of Contents

Section 1

RFP Section 3.26.1.1.F FEMA Floodplain Documentation 1-1

Section 2

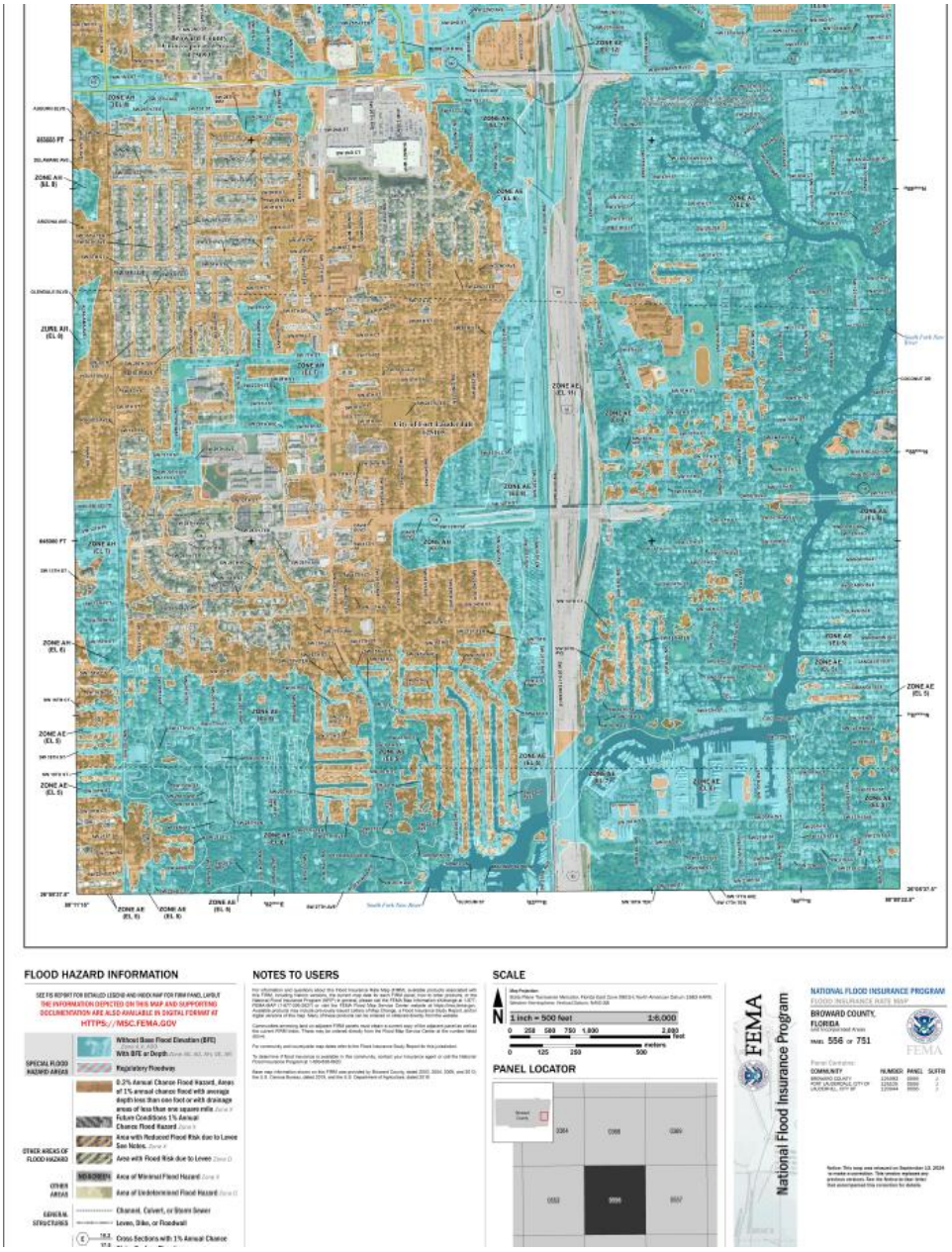
RFP Section 3.26.1.1.F.2 List of Proposed Sites with indication of those in a FEMA floodplain 2-1

Use or disclosure of this proposal is subject to the restrictions on the cover page.
Motorola Solutions

Section 1

RFP Section 3.26.1.1.F FEMA Floodplain Documentation

Motorola is not proposing any new greenfield sites in our design. For the single site where Motorola is providing a new Shelter (Future State of Florida site), Motorola has included the FEMA 100 year flood plain analysis. Based on the analysis, this site is in a potential flood zone area and thus, to mitigate the risk, Motorola has included all costs required for a raised platform for this shelter.



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Motorola Solutions

Section 2

RFP Section 3.26.1.1.F.2 List of Proposed Sites with indication of those in a FEMA floodplain

Motorola is not proposing any new greenfield sites in our design. For the single site where Motorola is providing a new Shelter (Future State of Florida site), Motorola has included the FEMA 100 year flood plain analysis. Based on the analysis, this site is in a potential flood zone area and thus, to mitigate the risk, Motorola has included all costs required for a raised platform for this shelter.

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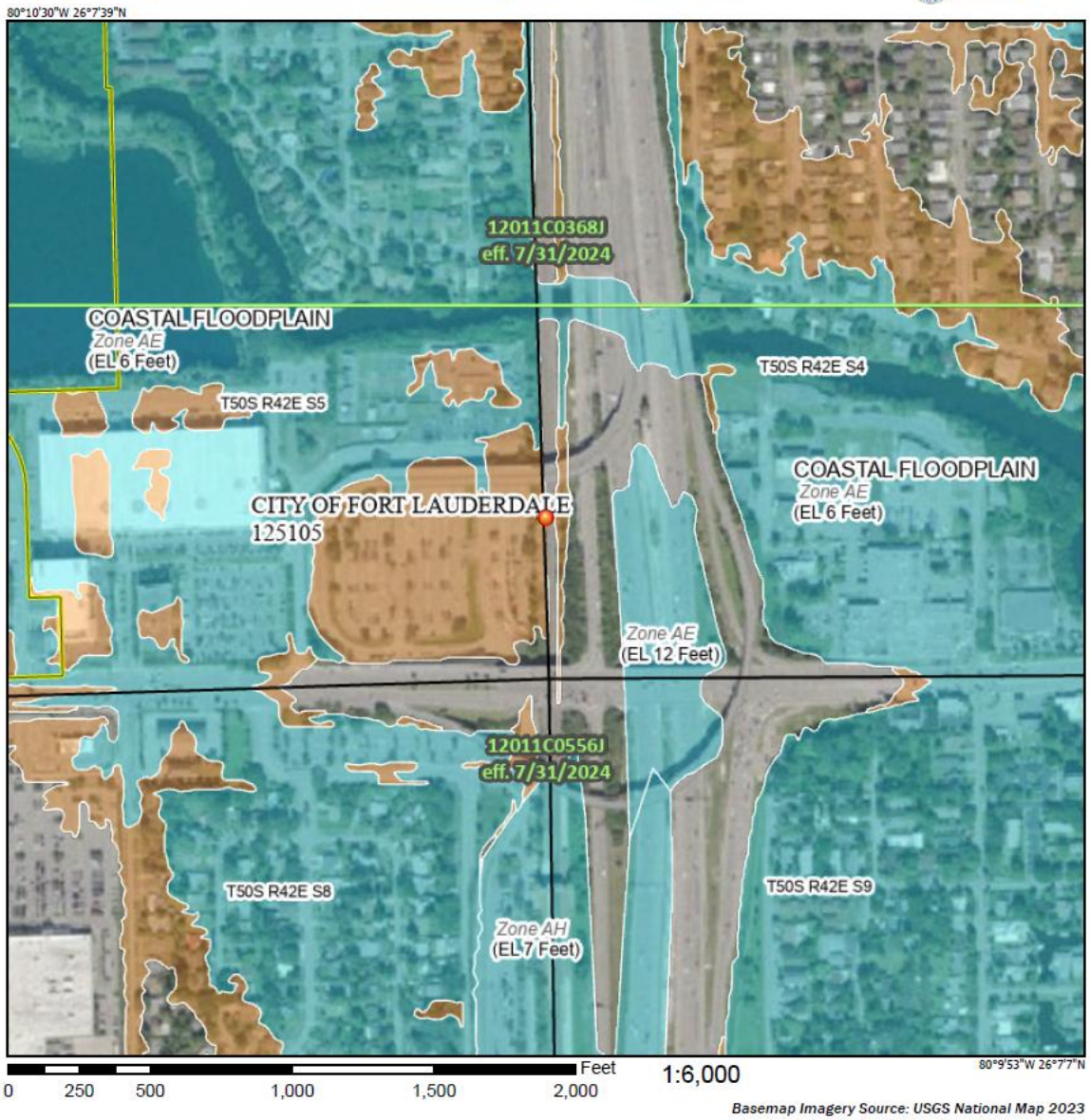
Motorola Solutions

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/18/2025 at 4:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

RFP Section 3.26.1.1.F.2 List of Proposed Sites with indication of those in a FEMA floodplain

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 45 - FCC Type Acceptance Documentation and MIL-STD Documentation

RFP # 549

December 18, 2025

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Motorola Solutions

Section 1

RFP Section 3.42.2.1.A and 3.42.5.1.C – FCC Type Acceptance Documentation and MIL-STD Documentation

The following attachment includes information for both of these requirements listed in the RFP.

Use or disclosure of this proposal is subject to the restrictions on the cover page.
Motorola Solutions

APX NEXT XE

ALL-BAND P25 SMART RADIO

WHEN A CALL LEADS YOU INTO EXTREME ENVIRONMENTS, MAKE SURE YOUR FOCUS IS UNCOMPROMISED.

MISSION-CRITICAL VOICE & DATA. ROOTED IN SAFETY.

Your radio is your lifeline. APX NEXT® XE is our next step in advancing it. Designed for ruggedness in extreme environments and with our best audio ever. Exaggerated controls now paired with a tough touchscreen that works with or without gloves, in the hottest, wettest, grittiest conditions. SmartConnect keeps you connected even beyond your radio system. The result is a radio that works when you need it, without pause, distraction or doubt.

EFFORTLESS IS ALWAYS IN REACH.

APX NEXT XE is designed for effortless usability when everything is on the line. Oversized intuitive controls are easily distinguished by touch. A mission-critical touchscreen makes it fast and easy to operate your radio. ViQi understands a huge range of voice commands, so you can operate the radio with eyes-up awareness. Every interaction is simple, fast and logical. You stay focused on what matters — your call, your crew and your safety.

BRINGING NEW INTELLIGENCE TO THE POINT OF ENGAGEMENT.

APX NEXT XE application services bring new intelligence to the field — right into your hands. Additions such as ViQi, SmartMessaging, SmartMapping, and SmartLocate rapidly give firefighters vital information, from pin point location details to important multimedia to improve situational awareness. And as part of our unique, end-to-end public safety ecosystem, APX NEXT XE data and operations are secure, and new capabilities can be seamlessly added as your needs evolve.

PROVISION & UPDATE YOUR FLEET IN MINUTES, NOT MONTHS.

APX NEXT XE gives you back time: a cloud-based provisioning system allows you to prepare radios before they arrive. Remote updating keeps radios in the field, with zero touch and zero downtime. MyView Portal provides direct access to subscriptions, warranties and licenses, and a range of services helps you manage your operation. With APX NEXT XE, your ownership experience is streamlined, so your firefighters stay focused and ready.

MISSION-CRITICAL DESIGN

Performance antennas improve comfort and wearability*

Exaggerated hard controls, protected against

accidental activation

High Dynamic Range microphones, for outstanding audio capture

Mission-critical touchscreen: rugged, usable with gloves, readable in all lighting conditions

Oversized display sleep/wake and home button

Exaggerated emergency button

Large color top screen displays critical information at a glance

Exaggerated ViQi button

Exaggerated PTT button

UL Division 2 Standard 4400 mAh battery, with 5650 mAh high-capacity option

3 programmable side buttons

Standard housing color in black.

*Radio shown with optional 7/800 stubby antenna.

FEATURES

OPERATION MODES

Digital Trunking: 9600 Baud APCO P25 Phase 1 FDMA and Phase 2 TDMA
Digital Conventional: APCO 25
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink®
Analog Trunking: MDC 1200
ASTRO® 25 Integrated Voice and Data
SmartConnect Multi-net Connectivity*

FREQUENCY BANDS

All-band: Simultaneous Operation in VHF, UHF Range 1, UHF Range 2, 700 and 800 MHz Bands
Available in Multi-Band and Single-Band Configurations
Up to 3000 Channels
Up to 125 Zones

ADDITIONAL CONNECTIVITY

Bluetooth (Version 5.0)
Wi-Fi (802.11b/g/n/ac), 2.4 and 5 GHz Bands
LTE (FirstNet®, Verizon and Bell Mobility-certified)
NFC (Near-Field Communications)**

AUDIO FEATURES

3 W Speaker with Adaptive Equalization
2 Internal HDR Microphones
Adaptive Dual-sided Operation
Adaptive Noise Suppression Intensity
Adaptive Gain Control
Adaptive Windporting
IMPRES™ Audio Accessory Compatibility

MANAGEMENT

RadioCentral™*
SmartProgramming*
Customer Programming Software (CPS)
Radio Management*

LOCATION-TRACKING

Built-in GNSS (GPS, Galileo, GLONASS) and A-GPS
SmartLocate and Indoor Positioning*
Mission-critical Geofence**
SmartMapping*

SECURITY

256-bit AES*
Single-key ADP Encryption*
Software Key
P25 Authentication*
Multikey for 128 Keys and Multi-algorithm*
Over-The-Air Keyloading***
Over-The-Air Rekeying (OTAR)*

INGRESS PROTECTION

IP6x Dust
IPx8 Submersion (2 m, 4 hr)
MIL-STD Delta-T, 512.X Procedure 1

MESSAGING

Text Messaging
Freeform or Canned Messages
SmartMessaging*

USER INTERFACE

3.6" Mission-critical Touchscreen: 800x480 TFT 24-bit Full Color Transflective Display, 1 mm Toughened Glass Lens
Capacitive Touch Technology: Usable with Gloves
Up to 4 mm Thick, Resistant to False Actuation from Fresh or Salt Water, Snow, Ice, Dirt or Grease
High Velocity User Interface: Large Touch Targets, Shallow Menu Hierarchy, Home Screen Information at a Glance, Integrated Applications
1.2" Top Display: 200x112 TFT 18-bit Color Transflective Screen, 1 Line of Icons, 2 Lines of Text, 14 Characters per Line, 2 mm Toughened Glass Lens
PTT Button: 1.50 x 0.67 in (38 x 17 mm)
Large 16-position Channel Selector
Large Angled Power/Volume Knob
Large Orange Emergency Button
3 Programmable Side Buttons (1-dot, 2-dot, purple)
Concentric 2-position Switch
ABC Zone Switch
ViQi Button (3-dot)
Display On/Off/Home Button

VIQI VOICE INTERACTION

Customizable Voice Announcements
Voice Control: Radio Operation with Intuitive Commands*
Virtual Partner Service*

ENERGY

Standard 4400 mAh UL Div 2 Battery
Optional High Capacity 5650 mAh UL Div 2 Battery*
IMPRES 2 Smart Battery Technology

SENSORS

Ambient Light
Accelerometer x2 (Display Orientation, Man Down)
Magnetometer (eCompass)

OTHER FEATURES

Radio Profiles
Enhanced Data*
Multicast Voting Scan*
Man Down / Fall Alert*
DVRS PSU*
Digital Tone Signaling*
APX Personnel Accountability*

DIMENSIONS

Radio with Standard Battery, no Antenna
Height: 5.6in (144 mm)
Width: 2.5 in (63 mm)
Depth: 2.0 in (51 mm)
Weight: 20.1 oz (570 g)

Radio with High Capacity Battery, no Antenna
Height: 7.4 in (187 mm)
Width: 2.5 in (63 mm)
Depth: 2.0 in (51 mm)
Weight: 24.4 oz (692 g)

*Optional Feature **Hardware-ready ***Included with OTAR

PERFORMANCE

TRANSMITTER

	Footnote	VHF	UHF Range 1	UHF Range 2	700 MHz	800 MHz
Frequency Range / Bandsplits	-	136-174 MHz	380-470 MHz	450-520 MHz	762-776, 792-806 MHz	806-825, 851-870 MHz
Channel Spacing	1	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power (Adjustable)	2	1-6 W	1-5 W	1-5 W	1-2.5 W	1-3 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	2	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm
Modulation Limiting (12.5 / 20 / 25 kHz Channel)	2	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz
Emissions (Conducted and Radiated)	2	-75 dBc	-75 dBc	-75 dBc	-75 dBc	-75 dBc
Audio Response	2	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	2	-53 / -55 dB	-52 / -54 dB	-51 / -54 dB	-50 / -55 dB	-49 / -53 dB
Audio Distortion (12.5 / 25 kHz Channel)	2	0.9% / 0.9%	0.9% / 0.9%	0.9% / 0.9%	0.9% / 0.9%	0.9% / 0.9%

RECEIVER

	Footnote	VHF	UHF Range 1	UHF Range 2	700 MHz	800 MHz
Frequency Range / Bandsplits	-	136-174 MHz	380-470 MHz	450-520 MHz	762-776, 799-806 MHz	851-870 MHz
Channel Spacing	1	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	2	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm
Analog Sensitivity (12 dB SINAD)	2	0.178 µV (-122.0 dBm)	0.211 µV (-120.5 dBm)	0.211 µV (-120.5 dBm)	0.224 µV (-120.0 dBm)	0.237 µV (-119.5 dBm)
Digital Sensitivity (1% BER)	3	0.266 µV (-118.5 dBm)	0.298 µV (-117.5 dBm)	0.298 uV (-117.5 dBm)	0.335 µV (-116.5 dBm)	0.335 µV (-116.5 dBm)
Digital Sensitivity (5% BER)	3	0.158 µV (-123.0 dBm)	0.178 µV (-122.0 dBm)	0.178 µV (-122.0 dBm)	0.224 µV (-120.0 dBm)	0.224 µV (-120.0 dBm)
Selectivity (12.5 / 25 kHz Channel)	2	77 / 84 dB	74 / 81 dB	74 / 81 dB	72 / 80 dB	72 / 79 dB
Intermodulation Rejection	2	82 dB	80 dB	80 dB	80 dB	80 dB
Spurious Rejection	2	98 dB	95 dB	95 dB	98 dB	98 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	2	55 / 59 dB	54 / 58 dB	54 / 58 dB	53 / 57 dB	52 / 56 dB
Audio Distortion	2	0.90%	0.90%	0.90%	0.90%	0.90%

IMPRES™ 2 BATTERIES

	Footnote	Part No	Capacity	Availability
Standard HazLoc	4	NNTN9217	4400 mAh	Included
High Capacity HazLoc	4	NNTN9090	5650 mAh	Optional

ENCRYPTION

Supported Encryption Algorithms	ADP, 256-bit AES, DES, DES-XL, DES-OFB, DVP-XL, Localized Algorithm
Encryption Algorithm Capacity	8
Encryption Keys per Radio	1024 Keys, Programmable for 128 Common Key References (CKR) or 16 Physical Identifiers (PID)
Encryption Keying	Local Key Loader and Over-the-Air Rekeying (OTAR)
Synchronization	XL - Counter Addressing; OFB - Output Feedback
Vector Generator	NIST-Approved Random Number Generator
Encryption Type	Digital and SecureNet, TLS1.2, SRTP
Key Storage	Tamper-protected Volatile or Non-volatile Memory
Key Erasure	Keyboard Command and Tamper Detection
Standards	FIPS 140-3 Level 1 and Level 3, FIPS 197
Device Certificates	x.509v3 ECC-P384, x.509v3 RSA-2048
Cipher Suites FIPS 140-2 Level 1	ECDHE_ECDSA_WITH_AES256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA TLS_RSA_WITH_AES_256_GCM_SHA384 SRTP_AEAD_AES_256_GCM1

LOCATION-TRACKING

Constellations	GPS, Galileo, GLONASS, A-GPS	-
Tracking Sensitivity	-159 dBm	-
Accuracy	<5m (95%)	See footnote 5
Cold Start	<60 Seconds (95%)	See footnote 5
Hot Start	<5 Seconds (95%)	See footnote 5
Mode	Autonomous (Assisted Only)	-

WIRELESS

LTE	Footnote	
Bands Supported	-	2, 4, 12, 13, 14, 17
Bands (Hardware Ready)	-	5
Device Category	-	4
Certifications	7	FirstNet®, Verizon®, Bell Mobility
WiFi		
Standards Supported		802.11a/b/g/n/ac
Frequency Range		2400-2472, 5180-5825 MHz
Security		Supports WPA-2, WPA, WEP
Capacity		Up to 20 SSIDs
Bluetooth		
Version		5.0
Frequency Range		2402 - 2480 MHz
Security		128-bit AES-CCM Encryption

AUDIO

Audio Output Power at Rated	3 W
Audio Output Power at Max	5 W
Audio Response (EIA)	+1, -3 dB
Speech Loudness at 12 in (300 mm)	105 Phon
Audio Features	Adaptive Equalization Adaptive Dual-sided Operation Adaptive Noise Suppression Intensity Adaptive Gain Control Adaptive Windporting IMPRES Audio

COLOR

Standard Color	Black
Optional Color	High Impact Green

ENVIRONMENTAL AND REGULATORY

MIL-STD

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G/H	
	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/Hot	501.5	I/A1, II/A1
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/A1, C3	503.3	I/A1, C3	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
Submersion	512.1	I	512.2	I	512.3	I	512.4	I	512.5	I
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	516.3	IV	516.4	IV	516.5	IV	516.6	IV

ENVIRONMENTAL

Operating Temperature	-30 to +60 °C (-22 to +140 °F)	See footnote 6
Storage Temperature	-40 to +85 °C (-40 to +185 °F)	See footnote 6
Humidity	Per MIL-STD 810	-
ESD	IEC 61000-4-2	-
Dust Resistance	IP6X	-
Water Resistance (Submersion)	IPX8 (2 meters, 4 hours) MIL-STD Delta-T, 512.X Procedure 1	-

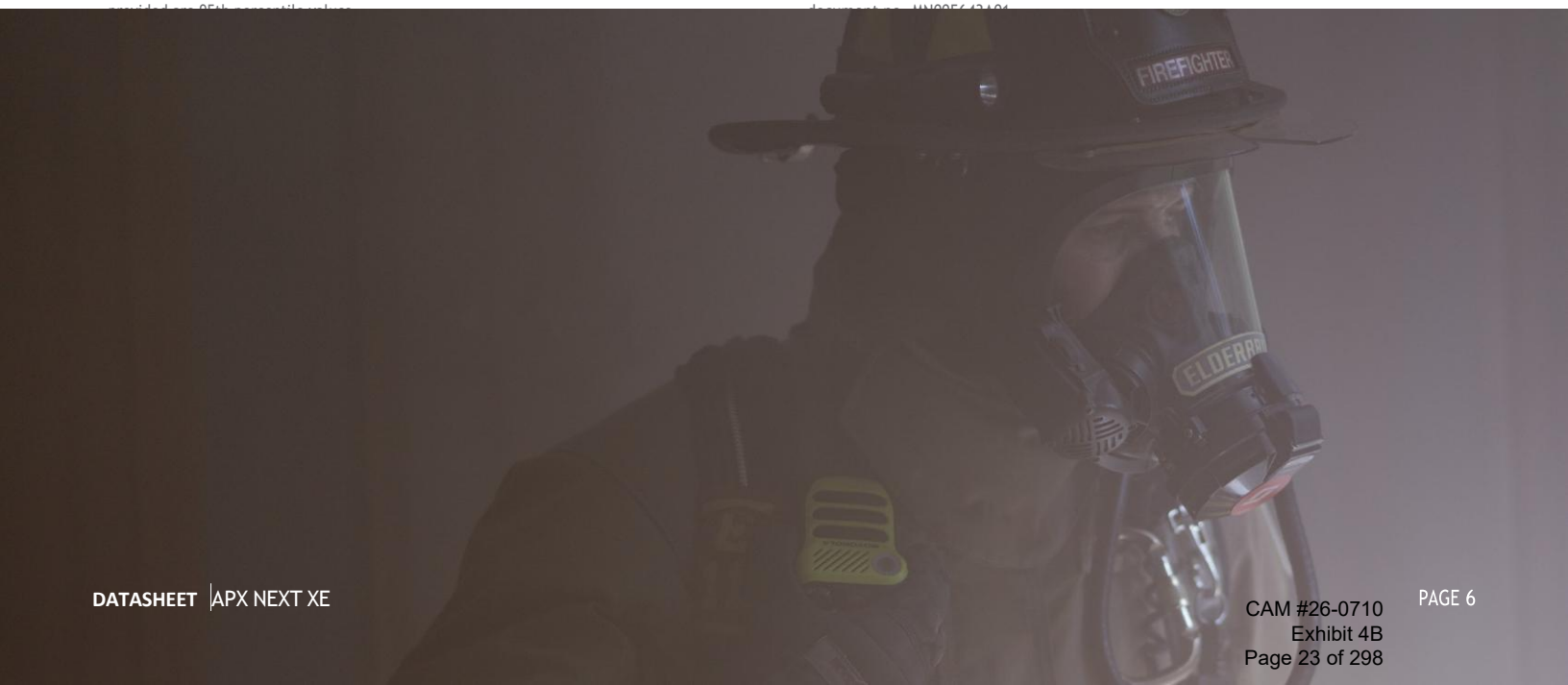
REGULATORY

FCC ID	AZ489FT7119
IC ID	109U-89FT7119
LMR	8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E, 20K0F1E
Bluetooth	1M18G1D, 1M1F1D, 2M1F1D
WiFi	12M9G1D, 16M7D1D, 17M9D1D, 36M2D1D, 17M5D1D, 18M4D1D, 36M8D1D, 76M1D1D
LTE	Band 2 (1850.7 - 1900 MHz), Modulation: *G7D, *D7W Band 4 (1710.7 - 1745 MHz), Modulation: *G7D, *D7W Band 12 (699.7 - 711 MHz), Modulation: *G7D, *D7W Band 14 (790.5 - 793 MHz), Modulation: *G7D, *D7W Band 17 (704 - 716 MHz), Modulation: *G7D, *D7W
All-band Model Number	H55TGT9PW8AN
Single-band Model Number	H45TGT9PW8AN

FOOTNOTES:

1. Please refer to local regulations for available channel bandwidths.
2. Measured conductively in analog mode per TIA / EIA 603 under nominal conditions, and at 1 W Rated Audio for Rx. Selectivity measured using the TIA-603 single-tone method.
3. Measured conductively in digital mode per TIA / EIA IS 102.
4. Listed by UL to non-incendive standards: UL 121201 and CAN/CSA C22.2 No. 213-17 as safe for use in Class I, Division 2, Groups A,B,C,D; Class II, Division 2, Groups F,G; Class III Hazardous Locations.
5. Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength. Specs provided are 95th percentile values.
6. LMR only. Front display, LTE, WiFi, Bluetooth and GPS not available when radio internal temperature is below -20 °C (-4 °F). Hi-capacity battery required for operation between -20 °C (-4 °F) and -30 °C (-22 °F). Batteries should be charged at 0 to +45 °C (+32 to +113 °F) and stored at +20 to +25 °C (+68 to +77 °F). Reference motorolasolutions.com/batterycare
7. SIM cards for the listed carriers can be pre-installed at Motorola Solutions factory or supplied by end user via Bring Your Own SIM (BYOS) for certified carriers.

All specifications are subject to change without notice. For full details consult product service manual, document no. MN005642A01.



ACCESSORIES

EXPAND AND CUSTOMIZE YOUR RADIO'S FUNCTIONALITY WITH BEST-IN-CLASS ACCESSORIES.

AUDIO

HEAR AND BE HEARD
LIKE NEVER BEFORE

XVE500 Remote Speaker Microphone with Channel Control

PMMN4132 - Green
PMMN4132_BLK - Black

- Loudest, clearest speaker
- Four HDR microphones
- Enhanced windporting
- New adaptive noise suppression
- Dedicated ViQi button

ANTENNAS

DESIGNED FOR
WEARABILITY

7/800 MHz Stubby Antenna 65 mm (760-870 MHz)

AN000296A01

Whip All-band Antenna 200 mm (V,U,7/800 MHz)

AN000297A01

Colored antenna ID bands are available for easy customization and come in packs of 10.

- 32012144001 Gray
- 32012144002 Yellow
- 32012144003 Green
- 32012144004 Blue
- 32012144005 Purple

CARRY

SECURE, EASY ACCESS

Classic Holster
PMLN8208

Boston Leather Carry Case
PMLN8209
Standard Capacity

ENERGY

MAXIMIZED POWER,
LIFE AND MANAGEMENT

IMPRES 2 Multi-Unit Charger

NNTN9115

IMPRES 2 Single-Unit Charger

NNTN9199

IMPRES 2 Standard Capacity Battery

NNTN9217
4400 mAh UL Div 2 (see footnote 4)

IMPRES 2 High Capacity Battery

NNTN9090
5650 mAh UL Div 2 (see footnote 4)

For a complete list of accessories, please visit motorolasolutions.com/apxnextxeutility

MANAGED AND SUPPORT SERVICES

ACHIEVE MISSION CRITICAL PERFORMANCE

Rely on us to help you achieve your performance targets with the right service level you need for systems, devices and applications. Each package provides a higher level of support, transferring the risk and responsibility to Motorola Solutions.

Motorola Solutions provides a range of service capabilities, including:

MYVIEW
A web-based platform that gives you a transparent, single source view of fleet status and service delivery information to help make smarter, faster and more proactive decisions.

TECHNICAL SUPPORT
Industry certified technical engineers can troubleshoot and provide prompt resolution to any technical issues, whether on-site dispatch or remote.

HARDWARE REPAIR AND SOFTWARE MAINTENANCE
Ensure continuous security, performance and enhanced functionality of your two-way radios by getting access to APX NEXT XE certified and tested release software updates and upgrades and protect your radios from normal wear and tear.

ACCIDENTAL DAMAGE
Radios are protected from accidental breakage or liquid spills and physical damage. With state-of-the-art diagnostic equipment all of your agency's radio components are protected in the event of an unexpected failure and are back in operation as soon as possible.

DEVICE PROGRAMMING
APX NEXT XE includes Customer Programming Software (CPS) for one-at-a-time programming. We can enable batch programming for radios with centralized management to dramatically reduce the time and resources needed to provision and update your radio fleet.

As an add-on service, our technical teams can help you provision and program your fleet of radios on-site and train your staff on the radio fleet commissioning and management.

PREVENTIVE MAINTENANCE
Our certified technicians conduct annual maintenance checks to help extend the useful life of your radios, reducing repair and replacement costs.

PROTECT YOUR **FOCUS** WHEN IT MATTERS MOST

For more information, please visit
motorolasolutions.com/apxnextxeradio

MOTOROLA SOLUTIONS

APX NEXT XE

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APX NEXT

PROTECT YOUR FOCUS

IN PUBLIC SAFETY, FOCUS IS YOUR GREATEST RESOURCE. MAKE SURE IT'S PROTECTED WITH APX NEXT®.

A MASSIVE ADVANCE IN MISSION-CRITICAL VOICE AND DATA

Your radio is your lifeline. APX NEXT is our next step in advancing it. It's designed to military standards for extreme ruggedness. The touchscreen works with or without gloves—in rain, dirt, and dust. Digital mics and high-power speakers deliver our best audio ever, while SmartConnect keeps you connected even beyond your P25 system. The result is a radio that works when you need it, without pause, distraction or doubt.

EFFORTLESS IS ALWAYS IN REACH

APX NEXT is designed for effortless usability when everything is on the line. Intuitive knobs and buttons are easily distinguished by touch. A mission-critical touchscreen makes it fast and easy to operate your radio. ViQi understands a huge range of natural language voice commands, so you can operate the radio with eyes-up awareness. Every interaction is simple, fast and logical. You stay focused on what matters—your mission and your safety.

BRING NEW INTELLIGENCE TO THE POINT OF ENGAGEMENT

APX NEXT mission-critical apps bring new intelligence to the field. ViQi enables natural language database queries, rapidly giving vital information, and letting dispatchers stay focused on critical situations. And as part of our unique, end-to-end public safety ecosystem, APX NEXT data and operations are secure, and new capabilities can be seamlessly added as your needs evolve.

UPDATE YOUR FLEET IN MINUTES, NOT MONTHS

APX NEXT gives you back time: a cloud-based provisioning system prepares radios before they arrive. Remote updating keeps radios in the field, with zero touch and zero downtime. MyView Portal provides direct access to subscriptions, warranties and licenses, and a range of services helps you manage your operation. With APX NEXT, your ownership experience is streamlined, so your valuable resources stay focused and ready.

MISSION-CRITICAL DESIGN

New antenna technology improves comfort and wearability

Large color top screen, for glanceable status updates

Intuitive hard controls, protected against accidental activation

Mission-critical touchscreen: rugged, usable with gloves, readable in all lighting conditions

Digital microphones, for outstanding audio capture

Large, distinctive buttons for PTT, emergency and ViQi, and two additional programmable side buttons

Standard 4400 mAh battery, with 5650 mAh high-capacity option

FEATURES

OPERATION MODES

Digital Trunking: 9600 Baud APCO P25 Phase 1 FDMA and Phase 2 TDMA
Digital Conventional: APCO 25
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink®
Analog Conventional: MDC 1200
ASTRO® 25 Integrated Voice and Data
SmartConnect Multi-net Connectivity*

FREQUENCY BANDS

All-band: Simultaneous Operation in VHF, UHF Range 1, UHF Range 2, 700 and 800 MHz Bands
Available in Multi-band and Single-band Configurations
Up to 3000 Channels
Up to 125 Zones

ADDITIONAL CONNECTIVITY

Bluetooth (Version 5.0)
WiFi (802.11a/b/g/n/ac), 2.4 and 5 GHz Bands
LTE (FirstNet®, Verizon, & Bell Mobility - certified)
NFC (Near-Field Communications)**

AUDIO FEATURES

3 W Speaker with Adaptive Equalization
2 Internal Digital Microphones
Adaptive Dual-sided Operation
Adaptive Noise Suppression Intensity
Adaptive Gain Control
Adaptive Windporting
IMPRES™ Audio Accessory Compatibility

MANAGEMENT

Customer Programming Software (CPS)
RadioCentral™*
SmartProgramming*
Radio Management*

LOCATION-TRACKING

Built-in GNSS (GPS, Galileo, GLONASS) and A-GPS
SmartLocate and Indoor Positioning*
Mission-critical Geofence**
SmartMapping*

SECURITY

256-bit AES*
Single-key ADP Encryption*
Software Key
P25 Authentication*
Multikey for 128 Keys and Multi-algorithm*
Over-The-Air Key Loading***
Over-The-Air Rekeying (OTAR)*

INGRESS PROTECTION

IP6x Dust
IPx8 Submersion (2 m, 4 hr)
MIL-STD Delta-T, 512.X Procedure 1

MESSAGING

Text Messaging
Freeform or Canned Messages
SmartMessaging*

USER INTERFACE

3.6" Mission-critical Touchscreen: 800x480 TFT 24-bit Full Color Transflective Display, 1 mm Toughened Glass Lens
Capacitive Touch Technology: Usable with Gloves
Up to 4 mm Thick, Resistant to False Actuation from Fresh or Salt Water, Snow, Ice, Dirt or Grease
High Velocity User Interface: Large Touch Targets, Shallow Menu Hierarchy, Home Screen Information at a Glance, Integrated Applications
1.2" Top Display: 200x112 TFT 18-bit Color Transflective Screen, 1 Line of Icons, 2 Lines of Text, 14 Characters per Line, 2 mm Toughened Glass Lens
PTT Button: 1.32 x 0.54 in (33.5 x 13.8 mm)
16-position Channel Selector
Angled Power/Volume Knob
Large Orange Emergency Button
3 Programmable Side Buttons (1-dot, 2-dot, purple)
Concentric 2-position Switch
ABC Zone Switch
ViQi Button (3-dot)
Display On/Off/Home Button

ViQi VOICE INTERACTION

Customizable Voice Announcements
Voice Control: Radio operation with intuitive commands*
Virtual Partner Service*

ENERGY

Standard 4400 mAh Battery
Optional High Capacity 5650 mAh Battery*
IMPRES 2 Smart Battery Technology

SENSORS

Ambient Light
Accelerometer x2 (Display Orientation, Man Down)
Magnetometer (eCompass)

OTHER FEATURES

Radio Profiles
Enhanced Data*
Multicast Voting Scan*
Man Down / Fall Alert*
DVRS PSU*
Digital Tone Signaling*

DIMENSIONS

Radio with Standard Battery, no Antenna
Height: 5.4 in (138 mm)
Width: 2.5 in (63 mm)
Depth: 1.7 in (43 mm)
Weight: 18.5 oz (525 g)

Radio with High Capacity Battery, no Antenna
Height: 7.1 in (180 mm)
Width: 2.5 in (63 mm)
Depth: 1.7 in (43 mm)
Weight: 22.8 oz (647 g)

*Optional Feature **Hardware-ready ***Included with OTAR

PERFORMANCE

TRANSMITTER

	Footnote	VHF	UHF Range 1	UHF Range 2	700 MHz	800 MHz
Frequency Range / Bandsplits	-	136-174 MHz	380-470 MHz	450-520 MHz	762-776, 792-806 MHz	806-825, 851-870 MHz
Channel Spacing	1	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power (Adjustable)	2	1-6 W	1-5 W	1-5 W	1-2.5 W	1-3 W
Frequency Stability (-30 ˚C to +60 ˚C; +25 ˚C Ref.)	2	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm
Modulation Limiting (12.5 / 20 / 25 kHz Channel)	2	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz
Emissions (Conducted and Radiated)	2	-75 dBc	-75 dBc	-75 dBc	-75 dBc	-75 dBc
Audio Response	2	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	2	-53 / -55 dB	-52 / -54 dB	-51 / -54 dB	-50 / -55 dB	-49 / -53 dB
Audio Distortion (12.5 / 25 kHz Channel)	2	0.75% / 0.75%	0.75% / 0.75%	0.75% / 0.75%	0.85% / 0.85%	0.85% / 0.85%

RECEIVER

	Footnote	VHF	UHF Range 1	UHF Range 2	700 MHz	800 MHz
Frequency Range / Bandsplits	-	136-174 MHz	380-470 MHz	450-520 MHz	762-776, 799-806 MHz	851-870 MHz
Channel Spacing	1	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Frequency Stability (-30 ˚C to +60 ˚C; +25 ˚C Ref.)	2	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm
Analog Sensitivity (12 dB SINAD)	2	0.178 µV (-122.0 dBm)	0.211 µV (-120.5 dBm)	0.211 µV (-120.5 dBm)	0.224 µV (-120.0 dBm)	0.237 µV (-119.5 dBm)
Digital Sensitivity (1% BER)	3	0.266 µV (-118.5 dBm)	0.298 µV (-117.5 dBm)	0.298 uV (-117.5 dBm)	0.335 µV (-116.5 dBm)	0.335 µV (-116.5 dBm)
Digital Sensitivity (5% BER)	3	0.158 µV (-123.0 dBm)	0.178 µV (-122.0 dBm)	0.178 µV (-122.0 dBm)	0.224 µV (-120.0 dBm)	0.224 µV (-120.0 dBm)
Selectivity (12.5 / 25 kHz Channel)	2	77 / 84 dB	74 / 81 dB	74 / 81 dB	72 / 80 dB	72 / 79 dB
Intermodulation Rejection	2	82 dB	80 dB	80 dB	80 dB	80 dB
Spurious Rejection	2	98 dB	95 dB	95 dB	98 dB	98 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	2	55 / 59 dB	54 / 58 dB	54 / 58 dB	53 / 57 dB	52 / 56 dB
Audio Distortion	2	0.90%	0.90%	0.90%	0.90%	0.90%

IMPRES™ 2 BATTERIES

	Footnote	Part No	Capacity	Availability
Standard	-	NNTN9216	4400 mAh	Included
High Capacity	-	NNTN9089	5650 mAh	Optional
Standard HazLoc	4	NNTN9217	4400 mAh	Optional
High Capacity HazLoc	4	NNTN9090	5650 mAh	Optional

ENCRYPTION

Supported Encryption Algorithms	ADP, 256-bit AES, DES, DES-XL, DES-OFB, DVP-XL, Localized Algorithm
Encryption Algorithm Capacity	8
Encryption Keys per Radio	1024 Keys, Programmable for 128 Common Key References (CKR) or 16 Physical Identifiers (PID)
Encryption Keying	Local Key Loader and Over-the-Air Rekeying (OTAR)
Synchronization	XL - Counter Addressing OFB - Output Feedback
Vector Generator	NIST-Approved Random Number Generator
Encryption Type	Digital and SecureNet, TLS1.2, SRTP
Key Storage	Tamper-protected Volatile or Non-volatile Memory
Key Erasure	Keyboard Command and Tamper Detection
Standards	FIPS 140-3 Level 1 and Level 3, FIPS 197
Device Certificates	x.509v3 ECC-P384, x.509v3 RSA-2048
Standards Supported	802.11a/b/g/n/ac
Cipher Suites FIPS 140-2 Level 1	ECDHE_ECDSA_WITH_AES256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA TLS_RSA_WITH_AES_256_GCM_SHA384 SRTP_AEAD_AES_256_GCM1

COLOR

Standard Color		Black/Gray	
Optional Side Panel Colors (Supplied as Retro-fit Kits)			
HN001451A02	GCAI Side, Red	HN001452A02	PTT Side, Red
HN001451A03	GCAI Side, Blue	HN001452A03	PTT Side, Blue
HN001451A04	GCAI Side, Coyote Brown	HN001452A04	PTT Side, Coyote Brown
HN001451A05	GCAI Side, Yellow	HN001452A05	PTT Side, Yellow

WIRELESS

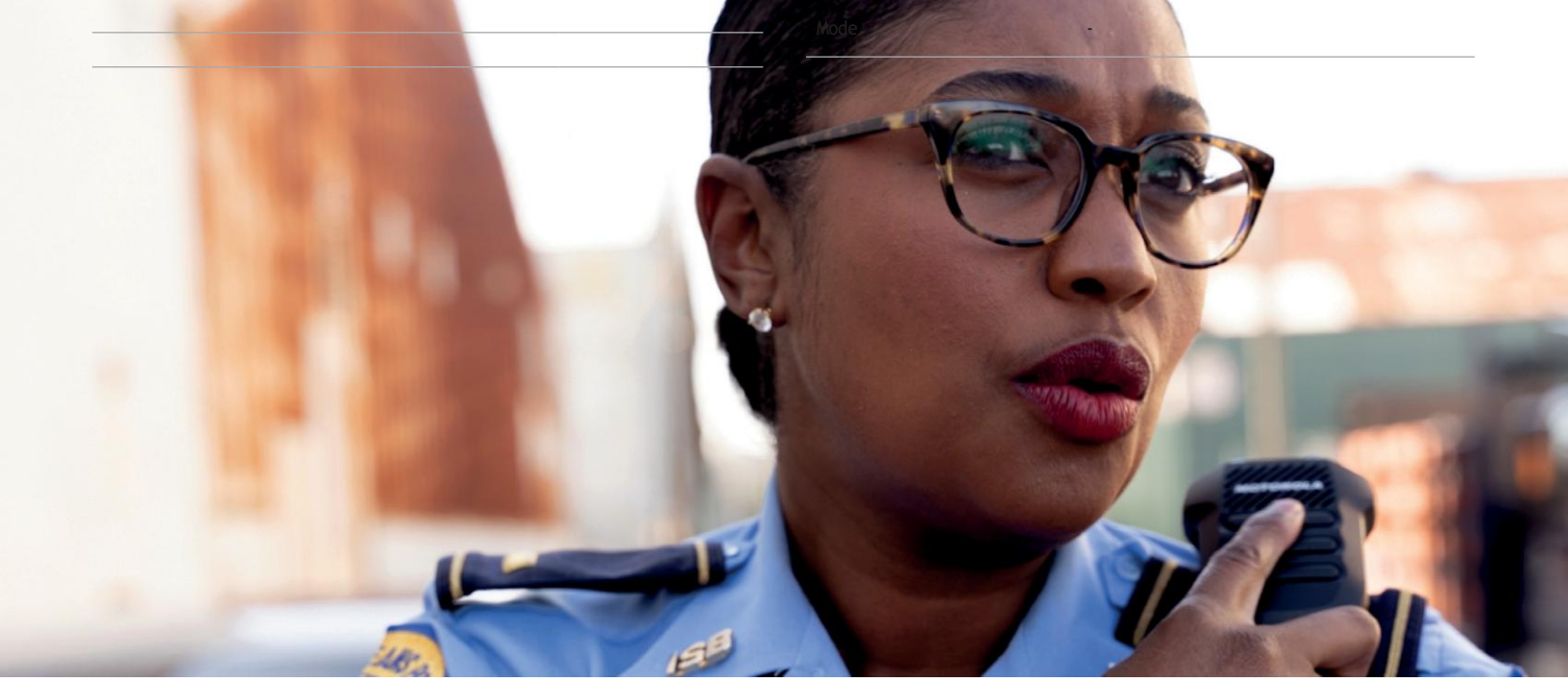
LTE	Footnote	
Bands Supported	-	2, 4, 12, 13, 14, 17
Bands (Hardware Ready)	-	5
Device Category	-	4
Certifications	5	FirstNet®, Verizon, Bell Mobility
WiFi		
Frequency Range		2400-2472, 5180-5825 MHz
Security		Supports WPA-2, WPA, WEP
Capacity		Up to 20 SSIDs
Bluetooth		
Version		5.0
Frequency Range		2402 - 2480 MHz
Security		128-bit AES-CCM Encryption

AUDIO

Audio Output Power at Rated	3 W
Audio Output Power at Max	5 W
Audio Response (EIA)	+1, -3 dB
Speech Loudness at 12 in (300 mm)	105 Phon
Audio Features	Adaptive Equalization Adaptive Dual-sided Operation Adaptive Noise Suppression Intensity Adaptive Gain Control Adaptive Windporting IMPRES Audio

LOCATION-TRACKING

	Footnote	
Constellations	-	GPS, Galileo, GLONASS, A-GPS
Tracking Sensitivity	-	-159 dBm
Accuracy	6	<5m (95%)
Cold Start	6	<60 Seconds (95%)
Hot Start	6	<5 Seconds (95%)



ENVIRONMENTAL AND REGULATORY

MIL-STD 810

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G/H	
	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/Hot	501.5	I/A1, II/A1
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/A1, C3	503.3	I/A1, C3	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
Submersion	512.1	I	512.2	I	512.3	I	512.4	I	512.5	I
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	516.3	IV	516.4	IV	516.5	IV	516.6	IV

ENVIRONMENTAL

	Footnote	
Operating Temperature	7	-30 to +60 °C (-22 to +140 °F)
Storage Temperature	7	-40 to +85 °C (-40 to +185 °F)
Humidity	-	Per MIL-STD 810
ESD	-	IEC 61000-4-2
Dust Resistance	-	IP6X
Water Resistance (Submersion)	-	IPX8 (2 meters, 4 hours) MIL-STD Delta-T, 512.X Procedure 1

REGULATORY

FCC ID	AZ489FT7119
IC ID	109U-89FT7119
LMR	8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E, 20K0F1E
Bluetooth	1M18G1D, 1M1F1D, 2M1F1D
WiFi	12M9G1D, 16M7D1D, 17M9D1D, 36M2D1D, 17M5D1D, 18M4D1D, 36M8D1D, 76M1D1D
LTE	Band 2 (1850.7 - 1900 MHz), Modulation: *G7D, *D7W Band 4 (1710.7 - 1745 MHz), Modulation: *G7D, *D7W Band 12 (699.7 - 711 MHz), Modulation: *G7D, *D7W Band 14 (788 - 798 MHz), Modulation *G7D, *D7W Band 17 (704 - 716 MHz), Modulation: *G7D, *D7W
All-band Model Number	H55TGT9PW8AN

FOOTNOTES:

1. Please refer to local regulations for available channel bandwidths.
2. Measured conductively in analog mode per TIA / EIA 603 under nominal conditions, and at 1 W Rated Audio for Rx. Selectivity measured using the TIA-603 single-tone method.
3. Measured conductively in digital mode per TIA / EIA IS 102.
4. Listed by UL to non-incendive standards: UL 121201 and CAN/CSA C22.2 No. 213-17 as safe for use in Class I, Division 2, Groups A,B,C,D; Class II, Division 2, Groups F,G; Class III Hazardous Locations.
5. SIM cards for the listed carriers can be pre-installed at the Motorola Solutions factory or supplied by the end user via Bring Your Own SIM (BYOS) for certified carriers.
6. Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength. Specs provided are 95th percentile values.
7. LMR only. Front display, LTE, WiFi, Bluetooth and GPS not available when radio internal temperature is below -20 °C (-4 °F). Hi-capacity battery required for operation between -20 °C (-4 °F) and -30 °C (-22 °F). Batteries should be charged at 0 to +45 °C (+32 to +113 °F) and stored at +20 to +25 °C (+68 to +77 °F) . Reference motorolasolutions.com/batterycare

All specifications are subject to change without notice. For full details consult product service manual, document no. MN005643A01.

CA 26-0710
Exhibit 4B
Page 33 of 298

ACCESSORIES

EXPAND AND CUSTOMIZE YOUR RADIO'S FUNCTIONALITY WITH BEST-IN-CLASS ACCESSORIES.

AUDIO

HEAR AND BE HEARD LIKE NEVER BEFORE

XVP Remote Speaker Microphone

PMMN4135

- Loudest, clearest speaker
- Four digital microphones
- Enhanced windporting
- New adaptive noise suppression
- Dedicated ViQi button

ANTENNAS

DESIGNED FOR WEARABILITY

7/800 MHz Stubby Antenna 65 mm (760-870 MHz)

AN000296A01

Whip All-band Antenna 200 mm (V,U,7/800 MHz)

AN000297A01

Colored antenna ID bands are available for easy customization and come in packs of 10.

- 32012144001 Gray
- 32012144002 Yellow
- 32012144003 Green
- 32012144004 Blue
- 32012144005 Purple

CARRY

SECURE, EASY ACCESS

Classic Holster

PMLN7947

Hybrid Leather Carry Case

PMLN7948
Standard Capacity

PMLN7964
High Capacity

ENERGY

MAXIMIZED POWER, LIFE AND MANAGEMENT

IMPRES 2 Multi-Unit Charger

NNTN9115

IMPRES 2 Single-Unit Charger

NNTN9199

IMPRES 2 Standard Capacity Battery

NNTN9126
4400 mAh

NNTN9127
4400 mAh UL Div 2 (see footnote 4)

IMPRES 2 High Capacity Battery

NNTN9089
5650 mAh

NNTN9090
5650 mAh UL Div 2 (see footnote 4)

For a complete list of accessories, please visit **motorolasolutions.com/apxnext**

MANAGED AND SUPPORT SERVICES

ACHIEVE MISSION CRITICAL PERFORMANCE

Rely on us to help you achieve your performance targets with the right service level you need for systems, devices and applications. Each package provides a higher level of support, transferring the risk and responsibility to Motorola Solutions.

Motorola Solutions provides a range of service capabilities, including:

MYVIEW
A web-based platform that gives you a transparent, single source view of fleet status and service delivery information to help make smarter, faster and more proactive decisions.

TECHNICAL SUPPORT
Industry certified technical engineers can troubleshoot and provide prompt resolution to any technical issues, whether on-site dispatch or remote.

HARDWARE REPAIR AND SOFTWARE MAINTENANCE
Ensure continuous security, performance and enhanced functionality of your two-way radios by getting access to APX NEXT certified and tested release software updates and upgrades and protect your radios from normal wear and tear.

ACCIDENTAL DAMAGE
Radios are protected from accidental breakage or liquid spills and physical damage. With state-of-the-art diagnostic equipment all of your agency's radio components are protected in the event of an unexpected failure and are back in operation as soon as possible.

DEVICE PROGRAMMING
APX NEXT includes Customer Programming Software (CPS) for one-at-a-time programming. We can enable batch programming for radios with centralized management to dramatically reduce the time and resources needed to provision and update your radio fleet.

As an add-on service, our technical teams can help you provision and program your fleet of radios on-site and train your staff on the radio fleet commissioning and management.

PREVENTIVE MAINTENANCE
Our certified technicians conduct annual maintenance checks to help extend the useful life of your radios, reducing repair and replacement costs.

PROTECT YOUR **FOCUS** WHEN IT MATTERS MOST

For more information, please visit
motorolasolutions.com/apxnext

MOTOROLA SOLUTIONS

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Data Sheet

APX N70

Single-band P25 portable two-way radio

Focused. Forward.

Safety and focus on the front line are paramount. Reliable and intuitive communications devices that are rugged and easy to use, are non negotiable for first responders. Clear communications have proven to be lifesaving in critical moments.

Reliable P25 radios must evolve to offer sophisticated features that work within a larger public safety ecosystem. They must deliver actionable intelligence to provide increased situational awareness during an incident.

We designed our APX N70 explicitly for this purpose. It provides public safety personnel the mission-critical communications and real-time information they need to stay connected and respond safely.

Inherently rugged, it offers an intuitive interface to ensure reliable eyes-up operation. Wherever they're working, responders will hear and be heard with the loudest and clearest audio possible.

The APX N70 works reliably across a variety of frequencies, modes and protocols. Communications are secure with hardware encryption algorithms and can be updated quickly with batch radio programming and management tools. Optional next generation features such as LTE and smart apps enhance in-field intelligence for improved situational awareness so first responders can respond with focus and efficiency.

MOTOROLA SOLUTIONS

New antenna technology improves comfort and wearability
Large color top screen for critical information at a glance
Intuitive hard controls, protected against accidental activation
Mission-critical touchscreen: rugged, usable with gloves, readable in all lighting conditions
HDR microphones, for outstanding audio capture
Large, distinctive buttons for PTT, emergency and ViQi, and two additional programmable side buttons
Programmable buttons for one-touch quick access

11.4 in
289 mm
6.3 in
159 mm
5.4 in
136 mm
2.4 in
60 mm
1.7 in
44 mm
3.1 in
78 mm
Samantha Butler
East Zone
Patrol 1
Alma Schwartz
P1
P2
P3
P4
P5
P6

Features

OPERATION MODES
Digital Trunking: 9600 Baud APCO P25 phase 1, FDMA and phase 2 TDMA
Digital Conventional: APCO 25
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink®
Analog Conventional: MDC 1200
ASTRO® 25 Integrated Voice and Data
SmartConnect Multi-net Connectivity[1]
7/800 MHz
UHF
Up to 3000 Channels
Up to 200 Zones[1]
Bluetooth (Version 5.0)
Wi-Fi 802.11 a/b/g/n/ac, 2.4 and 5 GHz Bands
LTE[1]
NFC (Near-Field Communications)[2]
3 W Speaker with Adaptive Equalization
2 Internal HDR Microphone
Adaptive Dual-sided Operation
Adaptive Noise Suppression Intensity[1]
Adaptive Gain Control[1]
Adaptive Windporting[1]
IMPRES™ Audio Accessory Compatibility
Noise Sensing Volume Control[1]
Receive Volume Leveling[1]

MANAGEMENT
RadioCentral™
Radio Management (RM)
CPS (Customer Programming Software)
SmartProgramming[1]

LOCATION-TRACKING
Built-in GNSS (GPS, Galileo and GLONASS)
SmartLocate and Indoor Positioning[1]
SmartMapping[1]

SECURITY
256-bit AES[1]
Single-key ADP Encryption
Software Key
P25 Authentication[1]
Multikey for up to 128 Keys and Multi-algorithm[1]
Touchless Key Provisioning[3]
Over-The-Air Rekeying (OTAR)[1]
Multi System Over The Air Rekeying (MS OTAR)
Class I - Division 1 Groups C, D; Division 2 Groups A, B, C, D
Class II - Division 1 Groups E, F, G; Division 2 Groups F, G
Class III - Hazardous Locations

MESSAGING
Canned Messages
SmartMessaging[1]

VOICE INTERACTION
Customizable Voice Announcements
ViQi Voice Control: Radio Actions with Intuitive Commands[1]
ViQi Virtual Partner Service[1]

ENERGY
Standard 3200 mAh Battery
Optional High-cap 4400 mAh Battery
Optional UL Div 1 3650 mAh Battery
IMPRES 2 Smart Battery Technology

SENSORS
Ambient Light (Intelligent lighting)
Accelerometer x2 (Display Orientation, Man Down)

OTHER FEATURES
Radio Profiles
Enhanced Data[1]
Multicast Voting Scan[1]
Man Down/Fall Alert[1]
DVRS PSU[1]
Digital Tone Signaling[1]
APX Personnel Accountability[1]
Instant Recall

INGRESS PROTECTION
IP6x Dust
IPx8 submersion (2 m, 4 hr)
MIL-STD Delta-T, 512.X Procedure 1

USER INTERFACE
3.0" Mission-critical Touchscreen: 360x600 TFT 24-bit Full Color Transflective Display
Capacitive Touch Technology: Usable with Gloves Up to 4 mm Thick, Resistant to False Actuation from Fresh or Saltwater, Snow, Ice, Dirt or Grease
High Velocity User Interface: Large Touch Targets, Shallow Menu Hierarchy, Home Screen Information at a Glance, Integrated Applications
1.2" Top Display: 200x112 TFT 18-bit Color Transflective Screen, 1 Line of Icons, 2 Lines of Text, 14 Characters per Line, 2 mm Toughened Glass Lens
PTT Button: 1.26 x 0.55 in (32 x 14 mm)
16-position Channel Selector
Angled Power/Volume Knob
Orange Emergency Button
3 Programmable Side Buttons (1-dot, 2-dot, purple)
Concentric 2-position Switch
ABC Zone Switch
ViQi Button (3-dot)
Display On/Off/Home Button
6 Programmable Buttons Under Display

DIMENSIONS
Radio with Standard Battery, no Antenna
Height: 5.4 in (136 mm)
Width: 2.4 in (60 mm)
Depth: 1.7 in (44 mm)
Weight: 17.4 oz (493 g)

[1] Optional Feature
[2] Hardware-ready
[3] Included with use of OTAR combined with RadioCentral
Feature list subject to change without notice

FREQUENCY BANDS

HAZLOC[1]
(WHEN USED WITH DIV1 BATTERY)

ADDITIONAL CONNECTIVITY

AUDIO FEATURES

Performance

TRANSMITTER				
	NOTE	700 MHZ	800 MHZ	UHF
Frequency Range / Bandsplits	-	762-776, 792-806 MHz	806-825, 851-870 MHz	380-520 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power (Adjustable)	1	1-2.5 W	1-3 W	1-5 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	1	±1.0 ppm	±1.0 ppm	±1.0 ppm
Modulation Limiting (12.5 / 20 / 25 kHz Channel)	1	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz
Emissions (Conducted and Radiated)	1	-75 dBc	-75 dBc	75 dBc
Audio Response	1	+1, -3 dB	+1, -3 dB	+1, -3 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-47 / -52 dB	-47 / -52 dB	-50 / -53 dB
Audio Distortion (12.5 / 25 kHz Channel)	1	1.00%	1.00%	1.00%

RECEIVER				
	NOTE	700 MHZ	800 MHZ	UHF
Frequency Range / Bandsplits	-	762-776, 799-806 MHz	851-870 MHz	380-520 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit
Audio Output Power at Rated	-	1 W / 3 W	1 W / 3 W	0.5 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	1	±1.0 ppm	±1.0 ppm	±1.0 ppm
Analog Sensitivity (12 dB SINAD)	2	0.25 µV	0.25 µV	0.18 (-122dBm)
Digital Sensitivity (1% BER)	3	0.375 µV	0.375 µV	0.24 (-119.5dBm)
Digital Sensitivity (5% BER)	3	0.24 µV	0.24 µV	0.14 (-124dBm)
Selectivity (12.5 / 25 kHz Channel)	1	-61.3 / -75.2 dB	-61.3 / -75.2 dB	62.2dB / 76dB
Intermodulation Rejection	-	80/78 dB	80 dB	79.6
Spurious Rejection	-	76.6 dB	76.6 dB	95dB
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-51 / -55 dB	-51 / -55 dB	-57 / -62 dB
Audio Distortion	-	1.00%	1.00%	0.9%

IMPRES™ 2 BATTERIES				
	FOOTNOTE	PART NO	CAPACITY	AVAILABILITY
Standard	-	PMNN4816	3200mAh	Included
HAZLOC	4	PMNN4818	3650mAh	Optional High
Capacity	-	PMNN4817	4400mAh	Optional

ENCRYPTION	
Supported Encryption Algorithms	ADP, AES-256, DES, DES-XL, DES-OFB, DVP-XL, Localized Algorithm
Encryption Algorithm Capacity	8
Encryption Keys per Radio	1024 Keys, Programmable for 64 Common Key References (CKR) , upgradable to 128 CKRs, or 16 Physical Identifiers (PID)
Encryption Keying	Local Key Loader and Over-the-Air Rekeying (OTAR)
Synchronization	XL - Counter Addressing, OFB - Output Feedback
Vector Generator	NIST-Approved Random Number Generator
Encryption Type	Digital and SecureNet, TLS1.2, SRTP
Key Storage	Tamper-protected Volatile or Non-volatile Memory
Key Erasure	Keyboard Command and Tamper Detection
Standards	FIPS 140-3 Level 1 and Level 3, FIPS 197
Device Certificates	x.509v3 ECC-P384, x.509v3 RSA-2048
Cipher Suites FIPS 140-2 Level 1	ECDHE_ECDSA_WITH_AES256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_GCM_ SHA384 TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA TLS_RSA_WITH_AES_256_GCM_SHA384 SRTP_AEAD_AES_256_GCM1

LOCATION TRACKING		
	FOOTNOTE	
Constellations	-	GPS, GLONASS and Galileo
Tracking Sensitivity	-	-159 dBm
Accuracy	5	<5m (95%)
Cold Start	5	<60 Seconds (95%)
Hot Start	5	<5 Seconds (95%)
Mode	-	Autonomous (Assisted Only)

WIRELESS		
LTE	FOOTNOTE	
Bands Supported	-	2, 4, 12, 13, 14, 17
Device Category	-	4
Certifications	6	FirstNet®, Verizon®, Bell Mobility
WIFI		
Standards Supported	-	802.11a/ b/g/n/ac
Frequency Range	-	2400-2472, 5180-5825 MHz
Security	-	Supports WPA-2, WPA, WEP
Capacity	-	Up to 20 SSIDs
BLUETOOTH		
Version	-	5.0
Frequency Range	-	2402 - 2480 MHz
Security	-	128-bit AES-CCM Encryption

AUDIO		
	STANDARD	UPGRADE
Audio Output Power at Rated	1 W	3 W
Audio Output Power at Max	3 W	5 W
Audio Response (EIA)	+1, -3 dB	+1, -3 dB
Speech Loudness at 12 in (300 mm)	102 phon	105 Phon
Audio Features	Adaptive Dual-sided Operation Adaptive Equalization Adaptive Gain Control IMPRES Audio	Adaptive Noise Suppression Intensity Adaptive Windporting Noise Sensing Volume Control Receiving Volume Leveling

Environmental and Regulatory

MIL-STD 810										
	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G/H	
	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/ Hot	501.5	I/A1, II/A1
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/A1, C3	503.3	I/A1, C3	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	I Proc	507.5	II/ Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	I Proc	509.5	I Proc
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.5	I
Blowing Sand	I Proc	I Proc	510.2	II	510.3	II	510.4	II	510.5	II
Submersion	512.1	I	512.2	I	512.3	I	512.4	I	512.5	I
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	516.3	IV	516.4	IV	516.5	IV	516.6	IV

ENVIRONMENTAL		
	FOOTNOTE	
Operating Temperature	7	-30 to +60 °C (-22 to +140 °F)
Storage Temperature	7	-40 to +85 °C (-40 to +185 °F)
Humidity	-	Per MIL-STD 810
ESD	-	IEC 61000-4-2
Dust Resistance	-	IP6X
Water Resistance (Submersion)	-	IPX8 (2 meters, 4 hours) MIL-STD Delta-T, 512.X Procedure 1

REGULATORY			
	MODEL NUMBER	FCC ID	IC ID
7/800 MHZ	H35UCT9PW8AN	AZ489FT7147	109U-89FT7147
UHF	H35XDT9PW8AN	AZ489FT7176	109U-89FT7176
LMR		8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E, 20K0F1E	
Bluetooth		1M18G1D, 1M1F1D, 2M1F1D	
WiFi		12M9G1D, 16M7D1D, 17M9D1D, 36M2D1D, 17M5D1D, 18M4D1D, 36M8D1D, 76M1D1D	
LTE		Band 2 (1850.7 - 1910 MHz), Modulation: *G7D, *D7W Band 4 (1710.7 - 1755 MHz), Modulation: *G7D, *D7W Band 12 (699.7 - 716 MHz), Modulation: *G7D, *D7W Band 13: (777-787 MHz), Modulation *G7D, D7W Band 14 (788 - 798 MHz), Modulation: *G7D, *D7W Band 17 (704 - 716 MHz), Modulation: *G7D, *D7W	

1. Measured in the analog mode per TIA / EIA 603 under nominal conditions. Selectivity reflects newer 2-tone test method as defined in revision D TIA603-D issued in 2010.
2. Measured conductively in analog mode per TIA / EIA 603 under nominal conditions.
3. Measured conductively in digital mode per TIA / EIA IS 102.CAAA under nominal conditions.
4. Listed by UL to the standards ANSI/TIA 4950-A and CAN/CSA C22.2 NO. 157-92 Classification Rating: Class I, Division 1, Groups C, D; Class II, Division 1, Group E, F, G; Class III, Hazardous (Classified) Locations. ANSI/ISA 12.12.01-2015 and CAN/CSA C22.2 No. 213-15; Class I, Division 2, Groups A, B, C, D; T3C
5. Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength. Specs provided are 95th percentile values.
6. LMR only. Front display, Wi-Fi, Bluetooth and GPS not available when radio internal temperature is below -20 °C (-4 °F). Batteries should be charged at 0 to +45 °C (+32 to +113 °F) and stored at +20 to +25 °C (+68 to +77 °F). Reference motorolasolutions.com/batterycare

To learn more, visit: www.motorolasolutions.com/apxn70

MOTOROLA SOLUTIONS

Motorola Solutions, Inc. 500 West Monroe Street, Chicago, IL 60661 U.S.A. motorolasolutions.com

This device in only available in North America.

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Data Sheet

APX N50

Single-band P25 portable two-way radio

Simple. Reliable. Secure.

Staying connected and being able to collaborate, whenever, wherever, is a prerequisite for mobile workers.

Our APX N50 is a slim yet rugged pick-up-and-go radio that's designed to give first responders, public-safety support and administrative staff secure communications that they can rely on in the field to stay organized and effectively respond to whatever the day throws at them.

Remarkably small and sleek and tough enough for all day use in harsh environments. ViQi Basic Voice Control, large controls and display make it simple to use on the go. This is a radio that optimizes speed and space. Whatever the environment, users can hear and be heard with loud and clear audio. Advanced microphones and exclusive speaker design combined with leading APX audio algorithms automatically filter background noise and adjust volume levels to the environment, keeping hands free and focus optimized.

The APX N50 works reliably across a variety of frequencies, modes and protocols. It connects seamlessly with accessories and other devices via Bluetooth® or Wi-Fi, and can even switch between radio coverage and Wi-Fi with SmartConnect. Hardware encryption algorithms, batch radio programming tools, and a portfolio of services and tech support keep communications secure and ensure devices always have the latest features.

MOTOROLA SOLUTIONS

New antenna technology improves comfort and wearability

Intuitive hard controls, protected against accidental activation

2 microphones capture audio from any direction

Distinctive buttons for PTT, emergency and ViQi, and two additional programmable side buttons

Programmable buttons for one-touch quick access

Custom speaker for loud and clear communications

11.2 in
285 mm

6.1 in
156 mm

5.3 in
135 mm

2.2 in
55 mm

1.3 in
33 mm

2.6 in
66 mm

Features

OPERATION MODES
Digital Trunking: 9600 Baud APCO P25 phase 1 FDMA and phase 2 TDMA
Digital Conventional: APCO 25
Analog Digital: 3600 Baud SmartNet®, SmartZone®, Omnilink®
Analog Conventional: MDC 1200
ASTRO® 25 Integrated Voice and Data
SmartConnect via W-iFi[1]*

FREQUENCY BANDS
7/800 MHz
VHF
UHF
Up to 1000 channels
Up to 65 Zones

ADDITIONAL CONNECTIVITY
Bluetooth (Version 4.2)
Wi-Fi 802.11 a/b/g/n/ac, 2.4 and 5 GHz Bands[1]

AUDIO FEATURES[2]
3 W Speaker with Adaptive Equalization
3 Microphones (2 Internal HDR, 1 Wind Mitigation) Adaptive Dual-sided Operation
Adaptive Noise Suppression Intensity[1]
Adaptive Gain Control[1]
Adaptive Windporting[1]
Noise Sensing Volume Control[1]
Receive Volume Leveling[1]
IMPRES Audio Accessory Compatibility

MANAGEMENT
Customer Programming Software (CPS)
Radio Management (RM)

LOCATION-TRACKING
Built-in GNSS (GPS, GLONASS)

SENSORS
Accelerometer (Man Down/Fall Alert)[1]

SECURITY
256-bit AES[1]
Single-key ADP encryption
Software Key
P25 Authentication[1]
Multikey for 48 Keys and Multi-algorithm[1]
Over-The-Air Rekeying (OTAR)[1]
Multi system Over The Air Rekeying (MS OTAR)

HAZLOC (WHEN USED WITH DIV1 BATTERY)
Class I - Division 1 Groups C, D; Division 2 Groups A, B, C, D
Class II - Division 1 Groups E, F, G; Division 2 Groups F, G
Class III - Hazardous Locations

MESSAGING
Canned Messages

VOICE INTERACTION
Customizable Voice Announcements
ViQi Basic Voice Control: Voice Actions with predetermined Commands[1]

ENERGY
Standard 2850 mAh Battery
Optional UL Div 1 3200 mAh Battery
IMPRES 2 Smart Battery Technology

INGRESS PROTECTION
IP6x Dust
IPx8 submersion (2 m, 2 hr)

USER INTERFACE
2.4" Mission-critical Display: 240x320 TFT 65k Color Transflective Display
PTT Button: 1.22 x 0.47 in (31 x 12 mm)
16-position Channel Selector
Power/Volume Knob
Orange Emergency Button
3 Programmable Side Buttons (1-dot, 2-dot, purple/3-dot)
2 Programmable Front Buttons

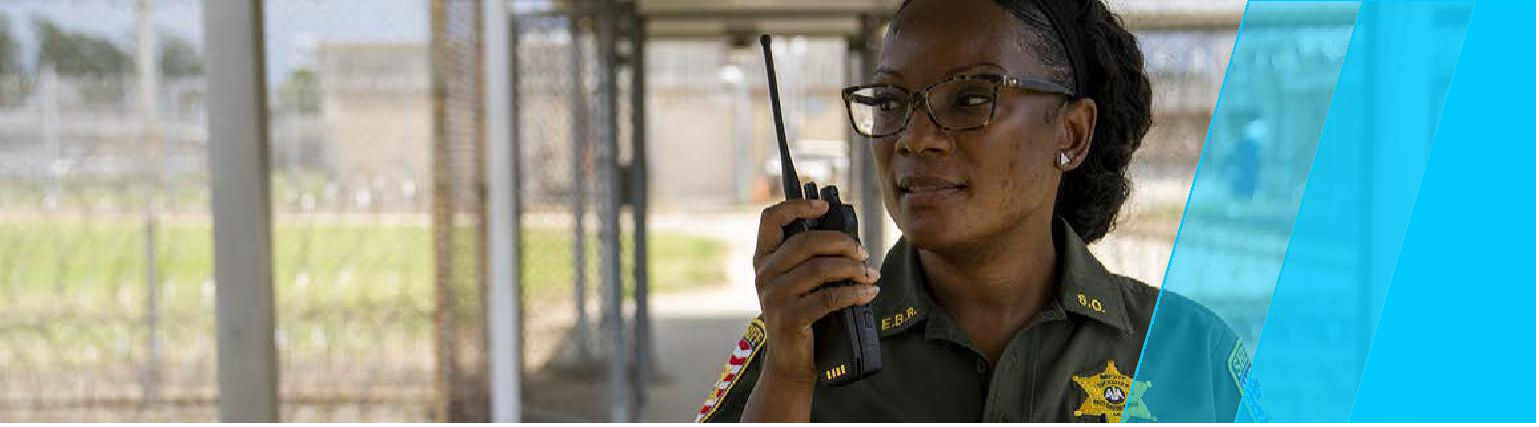
VOICE INTERACTION
RADIO WITH STANDARD BATTERY, NO ANTENNA
Height: 5.3 in (135 mm)
Width: 2.2 in (55 mm)
Depth: 1.3 in (33 mm)
Weight: 13.1 oz (370 g)

OTHER FEATURES
Radio Profiles
Enhanced Data[1]
Multicast Voting Scan[1]
Man Down/Fall Alert[1]
DVRS PSU[1]
Digital Tone Signaling[1]
APX Personnel Accountability[1]
Instant Recall
Geofence[1]
Stun Kill[1]
Data Modem Tethering[1]
Group Services[1]

* Contact sales team for availability in your country/region.

[1] Optional feature (English language only)

[2] If using an audio accessory, a compatible audio accessory must be selected to leverage optional audio features.



Performance

TRANSMITTER					
	NOTE	700 MHZ	800 MHZ	VHF	UHF
Frequency Range / Bandsplits	-	762-776, 792-806 MHz	806-825, 851-870 MHz	136-174 MHz	380-520 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power (Adjustable)	1	1-2.5 W	1-3 W	1-5 W	1-5 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	1	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm
Modulation Limiting (12.5 / 20 / 25 kHz Channel)	1	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz
Emissions (Conducted and Radiated)	1	-75 dBc	-75 dBc	-75 dBc	75 dBc
Audio Response	1	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-45 / -47 dB	-45 / -47 dB	-47 / -47 dB	-49 / -50 dB
Audio Distortion (12.5 / 25 kHz Channel)	1	1.00%	1.00%	1.00%	1.00%

RECEIVER					
	NOTE	700 MHZ	800 MHZ	VHF	UHF
Frequency Range / Bandsplits	-	762-776, 799-806 MHz	851-870 MHz	136-174 MHz	380-520 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Audio Output Power at Rated	1	0.5 W	0.5 W	0.5 W	0.5 W
Analog Sensitivity (12 dB SINAD)	2	0.25 µV	0.25 µV	0.216 µV	0.199 uV
Digital Sensitivity (1% BER)	3	0.4 µV	0.4 µV	0.277 µV	0.265 µV
Digital Sensitivity (5% BER)	3	0.25 µV	0.25 µV	0.188 µV	0.177 uV
Selectivity (12.5 / 25 kHz Channel)	1	-61.3 / -75.2 dB	-61.3 / -75.2 dB	-62.3 / -78.2 dB	-62 / -76 dB
Intermodulation Rejection	-	-75 dB	-75 dB	-79.0 dB	-80 dB
Spurious Rejection	-	-76.6 dB	-76.6 dB	-80.5 dB	-88db
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-47 / -53 dB	-47 / -53 dB	-45 / -51 dB	-50 / -55 dB
Audio Distortion	1	1.00%	1.00%	1.00%	1.00%

IMPRES™ 2 BATTERIES

	NOTE	PART NO	CAPACITY	AVAILABILITY
Standard	-	PMNN4813	2850 mAh	Included
HAZLOC	4	PMNN4815	3200 mAh	Optional

ENCRYPTION

Supported Encryption Algorithms	ADP, AES-256, DES, DES-XL, DES-OFB, DVP-XL, Localized Algorithm
Encryption Algorithm Capacity	8
Encryption Keys per Radio	1024 Keys, Programmable for 48 Common Key References (CKR) upgradable to 64 CKRs, or 16 Physical Identifiers (PID)
Encryption Keying	Local Key Loader and Over-the-Air Rekeying (OTAR)
Synchronization	XL - Counter Addressing OFB - Output Feedback
Vector Generator	NIST-Approved Random Number Generator
Encryption Type	Digital and SecureNet, TLS1.2, SRTP
Key Storage	Tamper-protected Volatile or Non-volatile Memory
Key Erasure	Keyboard Command and Tamper Detection
Standards	FIPS 140-3 Level 1 and Level 3, FIPS 197
Device Certificates	x.509v3 ECC-P384, x.509v3 RSA-2048
Cipher Suites FIPS 140-2 Level 1	TLS_RSA_WITH_AES_256_GCM_SHA384 SRTP_AEAD_AES_256_GCM1

LOCATION TRACKING

	NOTE	
Constellations	-	GPS and GLONASS
Tracking Sensitivity	-	-154 dBm
Accuracy	5	<10m (95%)
Cold Start	5	<60 Seconds (95%)
Hot Start	5	<5 Seconds (95%)
Mode		Autonomous (non-assisted) GPS

WIRELESS

WIFI	FOOTNOTE	
Standards Supported	-	802.11a/ b/g/n/ac
Frequency Range	-	2400-2472, 5180-5825 MHz
Security	-	Supports WPA-2, WPA, WEP
Capacity	-	Up to 20 SSIDs
BLUETOOTH	**FOOTNOTE**	
Version	-	4.2 (LE)
Frequency Range	-	2402 - 2480 MHz
Security	-	SSP Pairing 128-bit AES-CDM Encryption for voice, data and signaling

AUDIO

	STANDARD	UPGRADE
Audio Output Power at Rated	0.5 W	1 W
Audio Output Power at Max	2 W	3 W
Audio Response (EIA)	+1, -3 dB	+1, -3 dB
Speech Loudness at 12 in (300 mm)	98 phon	102 Phon
Audio Features	Adaptive Dual-sided Operation Adaptive Equalization Adaptive Gain Control IMPRES Audio	Adaptive Noise Suppression Intensity Adaptive Windporting Receive Volume Leveling Noise Sensing Volume Control

Environmental and Regulatory

MIL-STD 810

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G/H	
	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/BasicHot	501.5	I/A1, II/A1
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/A1, C3	503.3	I/A1, C3	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	I Proc	507.5	II/Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	I Proc	509.5	I Proc
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.5	I
Blowing Sand	I Proc	I Proc	510.2	II	510.3	II	510.4	II	510.5	II
Submersion	512.1	I	512.2	I	512.3	I	512.4	I	512.5	I
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	516.3	IV	516.4	IV	516.5	IV	516.6	IV

ENVIRONMENTAL

	FOOTNOTE	
Operating Temperature	6	-30 to +60 °C (-22 to +140 °F)
Storage Temperature	6	-40 to +85 °C (-40 to +185 °F)
Humidity	-	Per MIL-STD 810
ESD	-	IEC 61000-4-2
Dust Resistance	-	IP6X
Water Resistance (Submersion)	-	IPX8 (2 meters, 2 hours)

REGULATORY

	NOTE	MODEL NUMBER	FCC ID	IC ID
7/800 MHz		H25UCF9PW6AN	AZ489FT7161	109U-89FT7161
VHF		H25KDF9PW6AN	AZ489FT7162	109U-89FT7162
UHF		H25XDF9PW6AN	AZ489FT7175	109U-89FT7175
LMR		8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E		
Bluetooth		860KF1D, 1M15G1D, 1M19G1D, 1M05F1D		
Wi-Fi (VHF, UHF, 7/800 MHz)	2.4 GHz	13M5G1D, 16M9D1D, 17M8D1D		
	5.0 GHz	16M8D1D, 16M9D1D, 17M0D1D, 17M7D1D, 17M8D1D		

1. Measured in the analog mode per TIA / EIA 603 under nominal conditions. Selectivity reflects newer 2-tone test method as defined in revision D TIA603-D issued in 2010.
2. Measured conductively in analog mode per TIA / EIA 603 under nominal conditions.
3. Measured conductively in digital mode per TIA / EIA IS 102.CAAA under nominal conditions.
4. Listed by UL to the standards ANSI/TIA 4950-A and CAN/CSA C22.2 NO. 157-92 Classification Rating: Class I, Division 1, Groups C, D; Class II, Division 1, Group E, F, G; Class III, Hazardous (Classified) Locations. ANSI/ISA 12.12.01-2015 and CAN/CSA C22.2 No. 213-15; Class I, Division 2, Groups A, B, C, D; T3C. PMNN4815B or later revision required for UHF band
5. Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength. Specs provided are 95th percentile values.
6. Temperatures listed are for radio specifications. For battery, please refer to motorolasolutions.com/batterycare to ensure best or optimum battery operation.

All specifications shown are typical. Specifications are subject to change without notice.

To learn more, visit: www.motorolasolutions.com/apxn50

MOTOROLA SOLUTIONS

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Data Sheet

APX N30

Single-band P25 portable two-way radio

Easy. Efficient. Essential.

Seamless communication from a sleek radio. Easy to use and simple to manage. The APX N30 single-band P25 portable radio connects your teams to reliable P25 radio networks with all the essential features they need and nothing that they don't. The radio solution for mobile workers in public works, government services, education teams and other municipal roles looking for APX performance in a pared down, cost effective package.

Small and sleek, it's a radio that's easy to carry while being tough enough for use in harsh environments. ViQi Basic Voice Control, large controls and display make it simple to use on the go. And with loud and clear audio, crucial messages get through, even in noisy environments.

The APX N30 works reliably and securely across a variety of frequencies, modes and protocols. It connects seamlessly with accessories and other devices via Bluetooth or Wi-Fi. With SmartConnect[1], it can even switch between radio coverage and Wi-Fi connections. Choose whether to program offline or optimize fleet management by programming them in batches to save valuable time and resources. With a portfolio of services and tech support, radios stay safe and reliable throughout their lifetime.

[1] Please check with your local representative for availability in your country.

MOTOROLA SOLUTIONS

New antenna technology improves comfort and wearability

Intuitive hard controls, protected against accidental activation

2 microphones capture audio from any direction

Distinctive buttons for PTT, emergency and ViQi, and two additional programmable side buttons

Programmable buttons for one-touch quick access

Custom speaker for loud and clear communications

11.2 in
285 mm

6.1 in
156 mm

5.3 in
135 mm

2.2 in
55 mm

1.3 in
33 mm

2.6 in
66 mm

Features

OPERATION MODES
Digital Trunking: 9600 Baud APCO P25 phase 1 FDMA and phase 2 TDMA
Digital Conventional: APCO 25
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink®
Analog Conventional: MDC 1200
ASTRO® 25 Integrated Voice and Data
SmartConnect via W-iFi[1,3]
FREQUENCY BANDS
7/800 MHz
VHF
UHF
Up to 512 channels
Up to 50 Zones
ADDITIONAL CONNECTIVITY
Bluetooth (Version 4.2)
Wi-Fi 802.11 a/b/g/n/ac, 2.4 and 5 GHz Bands[1]
AUDIO FEATURES
2 High Dynamic Range (HDR) Microphones
Adaptive Dual-sided Operation
Adaptive Equalization
Adaptive Gain Control
IMPRES Audio Accessory Compatibility
MANAGEMENT
Customer Programming Software (CPS)
Radio Management (RM)
LOCATION-TRACKING
Built-in GNSS (GPS, GLONASS)
SENSORS
Accelerometer (Man Down/Fall Alert)[3]

SECURITY
256-bit AES Software Encryption[3]
Single-key ADP encryption
Software Key
P25 Authentication[3]
Multikey for 48 keys and Multi-algorithm[3]
HAZLOC (WHEN USED WITH DIV1 BATTERY)
Class I - Division 1 Groups C, D; Division 2 Groups A, B, C, D
Class II - Division 1 Groups E, F, G; Division 2 Groups F, G
Class III - Hazardous Locations
MESSAGING
Canned Messages
VOICE INTERACTION
Customizable Voice Announcements
ViQi Basic Voice Control: Actions with Predetermined Commands[2]
ENERGY
Standard 2850 mAh Battery
Optional UL Div 1 3200 mAh Battery
IMPRES 2 Smart Battery Technology
OTHER FEATURES
Radio Profiles
Enhanced Data[3]
Multicast Voting Scan[3]
Man Down/Fall Alert[3]
DVRS PSU[3]
Digital Tone Signaling[3]
APX Personnel Accountability[3]
Instant Recall
Geofence[3]
Data Modem Tethering[3]
Group Services[3]

INGRESS PROTECTION
IP6x Dust
IPx8 submersion (2 m, 2 hr)
USER INTERFACE
2.4" Mission-critical Display: 240x320 TFT 65k Color Transflective Display
PTT Button: 1.22 x 0.47 in (31 x 12 mm)
16-position Channel Selector
Power/Volume Knob
Orange Emergency Button
3 Programmable Side Buttons (1-dot, 2-dot, purple/3-dot)
2 Programmable Front Buttons
DIMENSIONS (RADIO WITH STANDARD BATTERY, NO ANTENNA)
Height: 5.3 in (135 mm)
Width: 2.2 in (55 mm)
Depth: 1.3 in (33 mm)
Weight: 13.1 oz (370 g)

[2] Optional Feature, available in English only
[3] Optional Feature

Performance

TRANSMITTER					
	NOTE	700 MHZ	800 MHZ	VHF	UHF
Frequency Range / Bandsplits	-	762-776, 792-806 MHz	806-825, 851-870 MHz	136-174 MHz	380-520 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power (Adjustable)	1	1-2.5 W	1-3 W	1-5 W	1-5 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	1	±1.0 ppm	±1.0 ppm	±1.0 ppm	±1.0 ppm
Modulation Limiting (12.5 / 20 / 25 kHz Channel)	1	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz
Emissions (Conducted and Radiated)	1	-75 dBc	-75 dBc	-75 dBc	75 dBc
Audio Response	1	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-45 / -47 dB	-45 / -47 dB	-47 / -47 dB	-49 / -50 dB
Audio Distortion (12.5 / 25 kHz Channel)	1	1.00%	1.00%	1.00%	1.00%

RECEIVER					
	NOTE	700 MHZ	800 MHZ	VHF	UHF
Frequency Range / Bandsplits	-	762-776, 799-806 MHz	851-870 MHz	136-174 MHz	380-520 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Audio Output Power at Rated	1	0.5 W	0.5 W	0.5 W	0.5 W
Analog Sensitivity (12 dB SINAD)	2	0.25 µV	0.25 µV	0.216 µV	.199 uV
Digital Sensitivity (1% BER)	3	0.4 µV	0.4 µV	0.277 µV	.265 µV
Digital Sensitivity (5% BER)	3	0.25 µV	0.25 µV	0.188 µV	.177 uV
Selectivity (12.5 / 25 kHz Channel)	1	-61.3 / -75.2 dB	-61.3 / -75.2 dB	-62.3 / -78.2 dB	-62 / -76 dB
Intermodulation Rejection	-	-75 dB	-75 dB	-79.0 dB	-80 dB
Spurious Rejection	-	-76.6 dB	-76.6 dB	-80.5 dB	-88db
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-47 / -53 dB	-47 / -53 dB	-45 / -51 dB	-50 / -55 dB
Audio Distortion	1	1.00%	1.00%	1.00%	1.00%

IMPRES™ 2 BATTERIES				
	FOOTNOTE	PART NO	CAPACITY	AVAILABILITY
Standard	-	PMNN4813	2850mAh	Included
HAZLOC	4	PMNN4815	3200mAh	Optional

ENCRYPTION	
Supported Encryption Algorithms	AES 256-bit Software Encryption (AES-256), DES-OFB
Encryption Keys per Radio	1024 Keys, Programmable for 48 Common Key References (CKR) or 16 Physical Identifiers (PID)
Encryption Keying	Local Key Loader
Vector Generator	NIST-Approved Random Number Generator
Synchronization	OFB - Output Feedback
Encryption Type	Digital, TLS1.2, SRTP
Key Storage	Non-volatile Memory
Key Erasure	Keyboard Command Detection
Standards	FIPS 140-3 Level 1, FIPS 197
Device Certificates	x.509v3 ECC-P384 x.509v3 RSA-2048
Cipher Suites FIPS 140-2	TLS_RSA_WITH_AES_256_GCM_SHA384 SRTP_AEAD_AES_256_GCM1

LOCATION TRACKING		
	FOOTNOTE	
Constellations	-	GPS and GLONASS
Tracking Sensitivity	-	-154 dBm
Accuracy	5	<10m (95%)
Cold Start	5	<60 Seconds (95%)
Hot Start	5	<5 Seconds (95%)
Mode	-	Autonomous (non-assisted) GPS

WIRELESS		
WIFI	FOOTNOTE	
Standards Supported	-	802.11a/ b/g/n/ac
Frequency Range	-	2400-2472, 5180-5825 MHz
Security	-	Supports WPA-2, WPA, WEP
Capacity	-	Up to 20 SSIDs
BLUETOOTH		
Version	-	4.2 (LE)
Frequency Range	-	2402 - 2480 MHz
Security	-	SSP Pairing 128-bit AES-CDM Encryption for voice, data and signaling

AUDIO	
Audio Output Power at Rated	0.5 W
Audio Output Power at Max	2 W
Audio Response (EIA)	+1, -3 dB
Speech Loudness at 12 in (300 mm)	98 phon
Audio Features	Adaptive Equalization Adaptive Dual-sided Operation Adaptive Gain Control IMPRES Audio

Environmental and Regulatory

MIL-STD 810										
	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G/H	
	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/ BasicHot	501.5	I/A1, II/A1
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/A1, C3	503.3	I/A1, C3	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	I Proc	507.5	II/ Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	I Proc	509.5	I Proc
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.5	I
Blowing Sand	I Proc	I Proc	510.2	II	510.3	II	510.4	II	510.5	II
Submersion	512.1	I	512.2	I	512.3	I	512.4	I	512.5	I
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	516.3	IV	516.4	IV	516.5	IV	516.6	IV

ENVIRONMENTAL		
	FOOTNOTE	
Operating Temperature	6	-30 to +60 °C (-22 to +140 °F)
Storage Temperature	6	-40 to +85 °C (-40 to +185 °F)
Humidity	-	Per MIL-STD 810
ESD	-	IEC 61000-4-2
Dust Resistance	-	IP6X
Water Resistance (Submersion)	-	IPX8 (2 meters, 2 hours)

REGULATORY				
	NOTE	MODEL NUMBER	FCC ID	IC ID
7/800 MHz	-	H15UCF9PW6AN	AZ489FT7161	109U-89FT7161
VHF	-	H15KDF9PW6AN	AZ489FT7162	109U-89FT7162
UHF		H15XDF9PW6AN	AZ489FT7175	109U-89FT7175
LMR	-	8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E		
Bluetooth	-	860KF1D, 1M15G1D, 1M19G1D, 1M05F1D		
Wi-Fi (VHF, UHF, 7/800)	2.4 GHz	13M5G1D, 16M9D1D, 17M8D1D		
	5.0 GHz	16M8D1D, 16M9D1D, 17M0D1D, 17M7D1D, 17M8D1D		

1. Measured in the analog mode per TIA / EIA 603 under nominal conditions. Selectivity reflects newer 2-tone test method as defined in revision D TIA603-D issued in 2010.
2. Measured conductively in analog mode per TIA / EIA 603 under nominal conditions.
3. Measured conductively in digital mode per TIA / EIA IS 102.CAAA under nominal conditions.
4. Listed by UL to the standards ANSI/TIA 4950-A and CAN/CSA C22.2 NO. 157-92 Classification Rating: Class I, Division 1, Groups C, D; Class II, Division 1, Group E, F, G; Class III, Hazardous (Classified) Locations. ANSI/ISA 12.12.01-2015 and CAN/CSA C22.2 No. 213-15; Class I, Division 2, Groups A, B, C, D; T3C. PMNN4815B or later revision required for UHF band.
5. Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength. Specs provided are 95th percentile values.
6. Temperatures listed are for radio specifications. For battery, please refer to motorolasolutions.com/batterycare to ensure best or optimum battery operation.

All specifications shown are typical. Specifications are subject to change without notice.

To learn more, visit: www.motorolasolutions.com/apxn30

MOTOROLA SOLUTIONS

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This device is available globally. Check with your local Motorola Solutions representative for availability in your country.

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APX 6500

SINGLE-BAND P25 MOBILE RADIO

STAY INFORMED. STAY SAFE.

You may not know what the next call will entail, but you do know that your team needs communication they can count on. Whether on a motorcycle, in a squad car or a fire truck, the rugged and compact design of the evolved APX™ 6500 mobile radio is designed to maximize the real estate in your vehicle and keep your entire agency safely connected. Now with integrated Wi-Fi, Bluetooth and SmartConnect, the APX 6500 gives you more ways to manage your radio and stay connected. And when your vehicle sustains a high impact, the radio can automatically alert dispatch.

Security is more important than ever. Criminals are testing you on the streets and over the air. Fight back with multiple levels of protection to encrypt and secure your voice and data communication against eavesdropping.

Stay connected, keep safe and secure your communications with the APX 6500 single-band mobile radio.

MOTOROLA SOLUTIONS

SMARTCONNECT

GET CONNECTED AND STAY CONNECTED
When the mission takes you out of range, you risk being left in the dark. The APX 6500, equipped with SmartConnect, can reroute P25 voice and data communication over broadband via built-in Wi-Fi or a tethered LTE/satellite router. Stay connected to your P25 radio system, even when outside of P25 coverage.

BUILT-IN Wi-Fi

VOICE AND DATA, ALL AT ONCE
Packed with all the connections you need, the APX 6500 keeps your team in touch and within reach of over-the-air updates. Receive new codeplugs, firmware updates and software features at the speed of Wi-Fi— without interruptions to voice communications.

DESIGNED TO SECURE AND PROTECT

LIGHTWEIGHT, COMPACT DESIGN

DEVICE MANAGEMENT SERVICES

O2 CONTROL HEAD

EXTREME USABILITY
The O2 control head provides rugged simplicity for efficient and confident communication. Extreme controls with easy to read color display and a built-in 7.5 watt speaker provides clear visual and audible user experiences. Available in high impact green or black.

O3 HANDHELD CONTROL HEAD

HANDHELD FLEXIBILITY
The O3 corded control head fits all your mobile controls in your hand. With the O3 your radio controls are never out of reach.

APX 6500 COMPATIBLE CONTROL HEADS*

E5 CONTROL HEAD

UNMATCHED READABILTY. OPTIMIZED USABILITY.
A bright color display and intelligent lighting makes the E5 easy to read under any condition while the optimized tactility and button placement reduces inadvertent actuations.

O7 CONTROL HEAD

INTEGRATED MULTI-FUNCTIONALITY
The O7 is a sophisticated control head with a color display and built-in keypad. It can integrate your radio vehicle control into a single ergonomic interface and supports dual radio installations.

* Compatible O5 control head is not shown.

FEATURES

GENERAL FEATURES	
Channel Capacity	1,000 channels standard, expandable to 3,000 channels
Encryption Algorithms	256-bit AES, ADP, DES, DES-XL, DES-OFB, DVP-XL

OPERATING MODES
Digital Trunking: 9600 Baud APCO P25 Phase 1 FDMA and Phase 2 TDMA
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink
Digital Conventional: APCO 25
Analog Conventional: Analog MDC 1200, Quik Call II System Configurations
SmartConnect Connectivity

INTEGRATED WI-FI, GPS AND DATA CONNECTIVITY
Wi-Fi 802.11 b/g/n with up to 20 Wi-Fi networks provisioned in the radio[1]
Data Modem Tethering[1]
ASTRO 25 Integrated Voice and Data
Enhanced Data[1]
Integrated GPS/GLONASS for Outdoor Location Tracking
Mission Critical Geofence[1]
Personnel Accountability[1]
SmartConnect[1]
Bluetooth (Version 4.2)

MANAGEMENT
Customer Programming Software (CPS)
Radio Management
Over-the-air Programming (OTAP)[1]

SECURITY
Tactical Inhibit[1]
P25 Authentication[1]
Software Key[1]
Single-key ADP Encryption[1]
Multikey for 128 keys and multi-algorithm[1]
Over-the-air Rekeying (OTAR)[1]

GPS/GNSS SPECIFICATIONS	
Channels	12
Tracking Sensitivity	-164 dBm
Accuracy[2]	<5 meters (95%)
Cold Start[2]	<60 seconds (95%)
Hot Start[2]	<5 seconds (95%)
Mode of Operation	Autonomous (Non-Assisted) GNSS or SBAS

[1] Optional
[2] Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength
* SmartConnect not available in all countries.
Please check with your Motorola Solutions representative for availability in your country.

ENCRYPTION	
Supported Encryption Algorithms	ADP, 256-bit AES, DES, DES-XL, DES-OFB, DVP-XL
Encryption Algorithm Capacity	8
Encryption Keys per Radio	Module capable of storing 1024 keys. Programmable for 128 Common KeY Reference (CKR) or 16 Physicalldentifier (PID)
Encryption Frame Re-sync Interval	P25 CAI 300 mSec
Encryption Keying	Key Loader
Synchronization	XL - Counter Addressing | OFB - Output Feedback
Vector Generator	National Institute of Standards and Technology (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 140-3 Level 3, FIPS 197

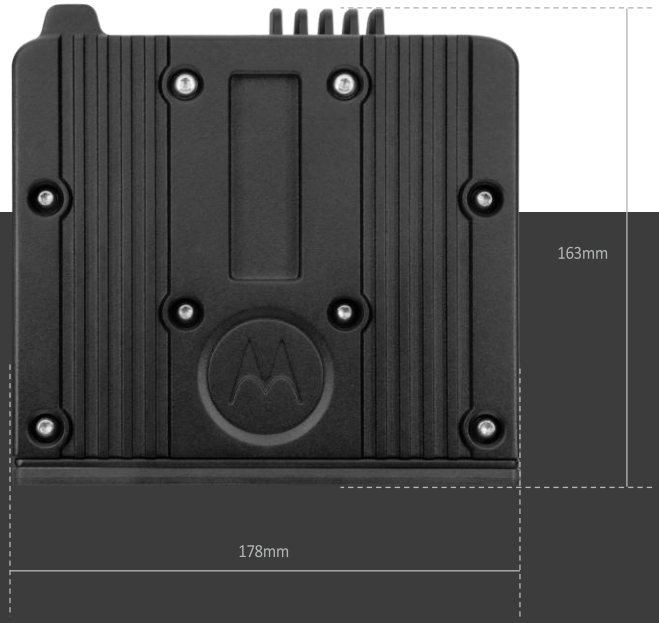
OTHER FEATURES
Text Messaging
Radio Profiles
Dynamic Zone
Intelligent Priority Scan
Unified Call List
Instant Recall
Data Modem Connection (wired or Wi-Fi)[1]
12 Character RFID Asset Tracking[1]
Digital Tone Signaling[1]

INTEGRATED WI-FI, GPS AND DATA CONNECTIVITY		
Frequency Range/Band splits		WLAN (Wi-Fi): 2412 - 2472 MHz; 5180 - 5320 MHz; 5500 - 5825 MHz
WLAN (WiFi) 802.11 b/g/n (2.4GHz) 802.11 a/n/ac (5GHz)	Security protocols	WPA-2, WPA, WEP
	SSIDs	Up to 20 pre-provisioned
Data Modem Tethering[1]		
Bluetooth Version 4.2	2402-2480 MHz Supports MPP Pairing[2] and compatible with HSP, PAN, DUN and SPP Profiles found in Off-the-shelf Bluetooth accessories. Supports up to 6 data connections and 1 audio connection.	

SIGNALING (ASTRO 25 MODE)	
Signalling Rate	9.6 kbps
Digital ID Capacity	10,000,000 Conventional / 48,000 Trunking
Digital Network Access Codes	4,096 network site addresses
ASTRO Digital User Group Addresses	4,096 network site addresses
Project 25 - CAI Digital User Group Addresses	65,000 Conventional / 4,094 Trunking
Error Correction Techniques	Golay, BCH, Reed-Solomon codes
Data Access Control	Slotted CSMA: Utilizes infrastructure-sourced data status bits embedded in both voice and data transmissions

[1] Optional
[2] For E5 Control Head only

DIMENSIONS AND WEIGHT		
Radio Transceiver	51 x 178 x 163 mm (2.0 x 7.0 x 6.4 in)	2.18 kg (4.80 lbs)
Radio Transceiver and O2 Control Head - Dash Mount	69 x 207 x 223 mm (2.7 x 8.1 x 8.8 in)	2.43 kg (5.36 lbs)
Radio Transceiver and O5 Control Head - Dash Mount	51 x 178 x 202 mm (2 x 7 x 8.0 in)	2.24 kg (4.94 lbs)
Radio Transceiver and E5 Control Head - Dash Mount	51 x 178 x 209 mm (2.0 x 7.0 x 8.2 in)	2.24 kg (4.94 lbs)
Radio Transceiver and O7 Control Head - Dash Mount	51x 178 x 208 mm (2 x 7 x 8.2 in)	2.24 kg (4.94 lbs)
Radio Transceiver and Remote Mount	51 x 178 x 193.6 mm (2 x 7 x 7.6 in)	2.18 kg (4.80 lbs)
O2 Control Head Remote Mount	68 x 206 x 53 mm (2.7 x 8.1 x 2.1 in)	-
O5 Control Head Remote Mount	51 x 180.3 x 64 mm (2.0 x 7.0 x 2.5 in)	-
E5 Control Head Remote Mount	51 x 178.5 x 64 mm (2.0 x 7.0 x 2.5 in)	-
O7 Control Head Remote Mount	51 x 178 x 40 mm (2.0 x 7.0 x 1.5 in)	-



PERFORMANCE AND REGULATORY

TRANSMITTER	VHF	UHF R1	UHF R2	700 MHz	800 MHz	900 MHz
Frequency Range/Bandsplits	136-174 MHz	380-470 MHz	450-520 MHz	764-776, 794-806 MHz	806-825, 851-870 MHz	896-902, 935-941 MHz
Rated RF Output Power (Adjustable)	1-50 W 1-25 W[3]	1-40 W 1-25 W[3]	1-45 W 1-25 W[3]	3-30 W	3-35 W	1-30 W
Frequency Stability (-30˚C to +60˚C; +25˚C Ref.)	± 0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM
Emissions	Conducted -85 dBc / Radiated -10 dBm	Conducted -85 dBc / Radiated -20 dBm	Conducted -85 dBc / Radiated -20 dBm	Conducted -75/-85 dBc / Radiated -20/-40 dBm	Conducted -75 dBc / Radiated -20 dBm	Conducted -70 dBc / Radiated -20 dBm
Modulation Limiting (12.5/20/25 kHz)	±5/±2.5 kHz	±5/±2.5 kHz	±5/±2.5 kHz	±5/±2.5 kHz	±5/±2.5 kHz	±2.5 kHz (12.5kHz only)
Modulation Fidelity (C4FM) 12.5 kHz Digital Channel	2.5%	1.50%	1.50%	1.50%	1.50%	1.50%
Audio Response	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)
FM Hum & Noise (12.5 kHz/25 kHz)	-52 dB / -53 dB	-50 dB / -53 dB	-50dB / -53dB	-48 dB / -50 dB	-48 dB / -50 dB	-45 dB (12.5kHz only)
Audio Distortion (12.5 kHz/25 kHz)	0.50%	0.50%	0.50%	0.50%	0.50%	0.80% (12.5kHz only)

RECEIVER	VHF	UHF R1	UHF R2	700 MHz	800 MHz	900 MHz
Frequency Range/Bandsplits	136-174 MHz	380-470 MHz	450-520 MHz	764-776 MHz	851-870 MHz	935-941 MHz
Channel Spacing	12.5/25 kHz	12.5/25 kHz	12.5/25 kHz	12.5/25 kHz	12.5/25 kHz	12.5 kHz
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Audio Output Power at Rated/Max	7.5 / 15 W	7.5 / 15 W	7.5 / 15 W	7.5 / 15 W	7.5 / 15 W	7.5 / 15 W
Frequency Stability (-30 ˚C to +60 ˚C; +25 ˚C Ref.)	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM
Analog Sensitivity (12db SINAD)	Pre-Amp -123 dBm (0.158 µV) / Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV) / Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV) / Standard -119 dBm (0.251 µV)	-121 dB (0.199 µV)	-121 dB (0.199 µV)	-120 dBm (0.224 µV)
5% BER	Pre-Amp -123 dBm (0.158 µV) / Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV) / Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV) / Standard -119 dBm (0.251 µV)	-121.5 dB (0.188 µV)	-121.5 dB (0.188 µV)	-121 dBm (0.199 µV)
Selectivity (12.5 kHz / 25 kHz / 30 kHz)	77 dB / 89 dB / 90 dB	72 dB / 83 dB / -	72 dB / 83 dB / -	75 dB / 85 dB / -	75 dB / 85 dB / -	74 dB (12.5kHz only)
Intermodulation Rejection (12.5 kHz / 25 kHz)	Pre-Amp 84 dB / Standard 86 dB	Pre-Amp 82 dB / Standard 86 dB	Pre-Amp 82 dB / Standard 86 dB	82 dB	82 dB	82 dB
Spurious Rejection	95 dB	93 dB	93 dB	91 dB	91 dB	91 dB
FM Hum & Noise (12.5 kHz / 25 kHz)	-50 dB / -59 dB	-50 dB / -55 dB	-50 dB / -55 dB	-50 dB / -59 dB	-50 dB / -59 dB	-50 dB (12.5kHz only)
Audio Distortion (12.5 kHz / 25 kHz)	1.20%	1.50%	1.50%	1.20%	1.20%	1.20% (12.5kHz only)

POWER AND BATTERY DRAIN	VHF	UHF R1	UHF R2	700 MHz	800 MHz	900 MHz
Frequency Range / Bandsplits	136-174 MHz	380-470 MHz	450-520 MHz	764-775, 794-806 MHz	806-825, 851-870 MHz	896-902, 935-941 MHz
RF Power Output	1-50 W 1-25 W[3]	1-40 W 1-25 W[3]	450-485 MHz: 1-45 W 485-512 MHz: 1-40 W 512-520 MHz: 1-25 W	3-30 W	3-35 W	896-901 MHz: 1-30W 901-902 MHz: 1-3W 935-940 MHz: 1-30W 940-941MHz:1-3W
Operation	13.8 V DC ±20% Negative Ground	13.8 V DC ±20% Negative Ground	13.8 V DC ±20% Negative Ground	13.8 V DC ±20% Negative Ground	13.8 V DC ±20% Negative Ground	13.8 V DC ±20% Negative Ground
Standby at 13.8V	0.85 A	0.85 A	0.85 A	0.85 A	0.85 A	0.85 A
Receive Current at Rated Audio at 13.8V	3.2 A	3.2 A	3.2 A	3.2 A	3.2 A	3.2 A
Transmit Current (A) at Rated Power	8 A @ 15 W 13 A @ 50 W	11 A @ 40 W 8A @ 15 W	11 A @ 40 W 8A @ 15 W	8 A @ 15 W	8 A @ 15 W 12 A @ 35 W	10 A @ 30 W 5 A @ 3 W

[3] 1-25 W applies to countries with a maximum 25W limit.

ENVIRONMENTAL	
Operating Temperature	-30ºC/+60ºC
Storage Temperature	-40ºC/+85ºC
Humidity	Per MIL-STD
ESD	IEC 61000-4-2
Water and Dust Intrusion (w/ O2 control head)	IP56, MIL-STD

RADIO MODEL NUMBER	
VHF	M25KSS9PW1BN
UHF R1	M25QSS9PW1BN
UHF R2	M25SSS9PW1BN
700/800	M25URS9PW1BN
800/900	M25VRS9PW1CN

FCC/IC TYPE ACCEPTANCE ID	
FCC/IC ID	**Band and Power Level**
FCC ID: AZ492FT7141 ISED ID: 109U-92FT7141	896-902MHz (1-30W)
	935-941MHz (1-30W)
FCC ID: AZ492FT7124 IC ID: 109U-92FT7124	764-776 MHz (3-30 W)
	794-806 MHz (3-30 W)
	806-824 MHz (3-35 W)
	851-870 MHz (3-35 W)
FCC ID: AZ492FT7130 IC ID: 109U-92FT7130	136-174 MHz (1-50 W)
FCC ID: AZ492FT7129 IC ID: 109U-92FT7129	380-470 MHz (1-40 W)
FCC ID: AZ492FT4967 ISED ID: 109U-92FT4967	450-520 MHz (1-45 W)
	485-512 MHz (1-40 W)
	512-520 MHz (1-25 W)

RED CERTIFICATION	
Designator	Band and Power Level
MMCR308PE	136-174MHz, (1-50W)
MMCR508PE	380-470MHz, (1-40W)

MOBILE MILITARY STANDARDS 810, C, D, E, F, G & H

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G		MIL-STD 810H	
	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	I/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/C3, II/C1	502.3	I/C3, II/C1	502.4	I/C3, II/C1	502.6	I/C3, II/C1	502.7	I/C3, II/C1
Temperature Shock	503.1	I	503.2	1/A1C3	503.3	1/A1C3	503.4	I	503.6	I/C	503.7	I/C
Solar Radiation	505.1	II	505.2	I	505.3	I	505.4	I	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	-	507.6	II/Aggravated	507.6	II/Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	-	509.6	-	509.7	-
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.6	I	510.7	I
Blowing Sand	-	-	510.2	II	510.3	II		II	510.6	II	510.7	II
Vibration	514.2	VIII, F, W	514.3	I/10, II/3	514.4	I/10, II/3	514.5	I/24	514.7	I/24	514.8	I/24, II/5
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

For more information, please visit
www.motorolasolutions.com/apx

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Data Sheet

APX N70 XE

Single-band P25 portable two-way radio

Keeping firefighters safe, focused and always in touch

When lives are threatened, the APX N70 XE radio is the lifeline that keeps teams safe, focused, and in touch during critical moments. Made for firefighters and EMS personnel, it combines high tier adaptive audio with intuitive operation, advanced connectivity, and streamlined device management. Every element of the rugged, ergonomic design maximizes task performance in unpredictable situations.

Large controls are easily operated with gloves, and the 3" Corning® Gorilla® Glass touch screen provides access to critical information and apps. Adaptive audio and high dynamic range mics ensure clear communication in noisy environments.

The APX N70 XE offers Wi-Fi and optional LTE connectivity, keeping crew members in touch even outside regular P25 radio coverage. Optional smart apps and services enhance situational awareness and collaboration.

A superior ownership experience reduces the burden on radio managers, allowing rapid over-the-air provisioning and updates to their entire fleet of devices. This ensures secure, reliable operation while giving access to new apps and functions, without needing to take radios out of service for manual maintenance.

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Features

OPERATION MODES
Digital Trunking: 9600 Baud APCO P25 phase 1, FDMA and phase 2 TDMA
Digital Conventional: APCO 25
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink®
Analog Conventional: MDC 1200
ASTRO® 25 Integrated Voice and Data
SmartConnect Multi-net Connectivity[1]

FREQUENCY BANDS
7/800 MHz
Up to 3000 Channels
Up to 200 Zones[1]

ADDITIONAL CONNECTIVITY
Bluetooth (Version 5.0)
Wi-Fi 802.11 a/b/g/n/ac, 2.4 and 5 GHz Bands
LTE[1]
NFC (Near-Field Communications)[2]

AUDIO FEATURES
3 W Speaker with Adaptive Equalization
2 Internal HDR Microphone
Adaptive Dual-sided Operation
Adaptive Noise Suppression Intensity[1]
Adaptive Gain Control[1]
Adaptive Windporting[1]
IMPRES™ Audio Accessory Compatibility
Noise Sensing Volume Control[1]
Receive Volume Leveling[1]

MANAGEMENT
RadioCentral™
Radio Management (RM)
CPS (Customer Programming Software)
SmartProgramming[1]

LOCATION-TRACKING
Built-in GNSS (GPS, Galileo and GLONASS)
SmartLocate and Indoor Positioning[1]
SmartMapping[1]

SECURITY
256-bit AES[1]
Single-key ADP Encryption
Software Key
P25 Authentication[1]
Multikey for up to 128 Keys and Multi-algorithm[1]
Touchless Key Provisioning[3]
Over-The-Air Rekeying (OTAR)[1]
Multi System Over The Air Rekeying (MS OTAR)

HAZLOC[1] (WHEN USED WITH DIV1 BATTERY)
Class I - Division 1 Groups C, D; Division 2 Groups A, B, C, D
Class II - Division 1 Groups E, F, G; Division 2 Groups F, G
Class III - Hazardous Locations

MESSAGING
Canned Messages
SmartMessaging[1]

VOICE INTERACTION
Customizable Voice Announcements
ViQi Voice Control: Radio Actions with Intuitive Commands[1]
ViQi Virtual Partner Service[1]

ENERGY
Included HAZLOC rated, UL Div 1 3650 mAh Battery
Optional 3200 mAh Battery
Optional High-cap 4400 mAh Battery
IMPRES 2 Smart Battery Technology

OTHER FEATURES
Radio Profiles
Enhanced Data[1]
Multicast Voting Scan[1]
Man Down/Fall Alert[1]
DVRS PSU[1]
Digital Tone Signaling[1]
APX Personnel Accountability[1]
Instant Recall

SENSORS
Ambient Light (Intelligent lighting)
Accelerometer x2 (Display Orientation, Man Down)

INGRESS PROTECTION
IP6x Dust
IPx8 submersion (2 m, 4 hr)
MIL-STD Delta-T, 512.X Procedure 1

USER INTERFACE
3.0" Corning® Gorilla® Glass touch screen: 360x600 TFT 24-bit Full Color Transflective Display
Capacitive Touch Technology: Usable with Gloves Up to 4 mm Thick, Resistant to False Actuation from Fresh or Saltwater, Snow, Ice, Dirt or Grease
High Velocity User Interface: Large Touch Targets, Shallow Menu Hierarchy, Home Screen Information at a Glance, Integrated Applications
1.2" Top Display: 200x112 TFT 18-bit Color Transflective Screen, 1 Line of Icons, 2 Lines of Text, 14 Characters per Line, 2 mm Toughened Glass Lens
PTT Button: 1.26 x 0.55 in (32 x 14 mm)
16-position Channel Selector
Angled Power/Volume Knob
Orange Emergency Button
3 Programmable Side Buttons (1-dot, 2-dot, purple)
Concentric 2-position Switch
ABC Zone Switch
ViQi Button (3-dot)
Display On/Off/Home Button
6 Programmable Buttons Under Display

DIMENSIONS
Radio with Standard Battery, no Antenna
Height: 6.3 in (159 mm)
Width: 2.4 in (60 mm)
Depth: 1.9 in (50 mm)
Weight: 20.9 oz (593g)

[1] Optional Feature

[2] Hardware-ready

[3] Included with use of OTAR combined with RadioCentral

Feature list subject to change without notice

Also available in black

Antenna technology improves comfort and wearability

Volume knob

3" Corning® Gorilla® Glass touch

Exaggerated PTT

Programmable buttons

Wake button

Programmable buttons for one-touch quick access

ViQi button

HAZLOC rated, UL Div I Battery

Emergency Button

Top display

3.4 in
85.5 mm
12.0 in
306 mm
6.3 in
159 mm
7.4 in
187 mm
2.4 in
60 mm
2.0 in
51 mm
En Route
East Zone
TAC 1
Miller, David
P1
P2
P3
P4
P5
P6

1.9 in
50 mm
East Zone
TAC 1
3.4 in
85.5 mm

59
POSEN

Performance

TRANSMITTER			
	NOTE	700 MHZ	800 MHZ
Frequency Range / Bandsplits	-	762-776, 792-806 MHz	806-825, 851-870 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit
Rated RF Output Power (Adjustable)	1	1-2.5 W	1-3 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	1	±1.0 ppm	±1.0 ppm
Modulation Limiting (12.5 / 20 / 25 kHz Channel)	1	±2.5 / ±4 / ±5 kHz	±2.5 / ±4 / ±5 kHz
Emissions (Conducted and Radiated)	1	-75 dBc	-75 dBc
Audio Response	1	+1, -3 dB	+1, -3 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-47 / -52 dB	-47 / -52 dB
Audio Distortion (12.5 / 25 kHz Channel)	1	1.00%	1.00%

RECEIVER			
	NOTE	700 MHZ	800 MHZ
Frequency Range / Bandsplits	-	762-776, 799-806 MHz	851-870 MHz
Channel Spacing	-	12.5 / 20 / 25 kHz	12.5 / 20 / 25 kHz
Maximum Frequency Separation	-	Full Bandsplit	Full Bandsplit
Audio Output Power at Rated	-	1 W / 3 W	1 W / 3 W
Frequency Stability (-30 °C to +60 °C; +25 °C Ref.)	1	±1.0 ppm	±1.0 ppm
Analog Sensitivity (12 dB SINAD)	2	0.25 µV	0.25 µV
Digital Sensitivity (1% BER)	3	0.375 µV	0.375 µV
Digital Sensitivity (5% BER)	3	0.24 µV	0.24 µV
Selectivity (12.5 / 25 kHz Channel)	1	-61.3 / -75.2 dB	-61.3 / -75.2 dB
Intermodulation Rejection	-	80/78 dB	80 dB
Spurious Rejection	-	76.6 dB	76.6 dB
FM Hum and Noise (12.5 / 25 kHz Channel)	-	-51 / -55 dB	-51 / -55 dB
Audio Distortion	-	1.00%	1.00%

IMPRES™ 2 BATTERIES

	FOOTNOTE	PART NO	CAPACITY	AVAILABILITY
HAZLOC rated, UL Div I (TIA 4950-A)	4	PMNN4818	3650mAh	Included
Standard	-	PMNN4816	3200mAh	Optional
High Capacity	-	PMNN4817	4400mAh	Optional

ENCRYPTION

Supported Encryption Algorithms	ADP, AES-256, DES, DES-XL, DES-OFB, DVP-XL, Localized Algorithm
Encryption Algorithm Capacity	8
Encryption Keys per Radio	1024 Keys, Programmable for 64 Common Key References (CKR) , upgradable to 128 CKRs, or 16 Physical Identifiers (PID)
Encryption Keying	Local Key Loader and Over-the-Air Rekeying (OTAR)
Synchronization	XL - Counter Addressing, OFB - Output Feedback
Vector Generator	NIST-Approved Random Number Generator
Encryption Type	Digital and SecureNet, TLS1.2, SRTP
Key Storage	Tamper-protected Volatile or Non-volatile Memory
Key Erasure	Keyboard Command and Tamper Detection
Standards	FIPS 140-3 Level 1 and Level 3, FIPS 197
Device Certificates	x.509v3 ECC-P384, x.509v3 RSA-2048
Cipher Suites FIPS 140-2 Level 1	ECDHE_ECDSA_WITH_AES256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA TLS_RSA_WITH_AES_256_GCM_SHA384 SRTP_AEAD_AES_256_GCM1

LOCATION TRACKING

	FOOTNOTE	
Constellations	-	GPS, GLONASS and Galileo
Tracking Sensitivity	-	-159 dBm
Accuracy	5	<5m (95%)
Cold Start	5	<60 Seconds (95%)
Hot Start	5	<5 Seconds (95%)
Mode	-	Autonomous (Assisted Only)

WIRELESS

LTE	FOOTNOTE	
Bands Supported	-	2, 4, 12, 13, 14, 17
Device Category	-	4
Certifications	6	FirstNet®, Verizon®, Bell Mobility
WIFI		
Standards Supported	-	802.11a/ b/g/n/ac
Frequency Range	-	2400-2472, 5180-5825 MHz
Security	-	Supports WPA-2, WPA, WEP
Capacity	-	Up to 20 SSIDs
BLUETOOTH		
Version	-	5.0
Frequency Range	-	2402 - 2480 MHz
Security	-	128-bit AES-CCM Encryption

AUDIO

	STANDARD	UPGRADE
Audio Output Power at Rated	1 W	3 W
Audio Output Power at Max	3 W	5 W
Audio Response (EIA)	+1, -3 dB	+1, -3 dB
Speech Loudness at 12 in (300 mm)	102 phon	105 Phon
Audio Features	Adaptive Dual-sided Operation Adaptive Equalization Adaptive Gain Control IMPRES Audio	Adaptive Noise Suppression Intensity Adaptive Windporting Noise Sensing Volume Control Receiving Volume Leveling

Environmental and Regulatory

MIL-STD 810										
	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G/H	
	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/ Hot	501.5	I/A1, II/A1
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/A1, C3	503.3	I/A1, C3	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	I Proc	507.5	II/ Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	I Proc	509.5	I Proc
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.5	I
Blowing Sand	I Proc	I Proc	510.2	II	510.3	II	510.4	II	510.5	II
Submersion	512.1	I	512.2	I	512.3	I	512.4	I	512.5	I
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	516.3	IV	516.4	IV	516.5	IV	516.6	IV

ENVIRONMENTAL		
	FOOTNOTE	
Operating Temperature	6	-30 to +60 °C (-22 to +140 °F)
Storage Temperature	6	-40 to +85 °C (-40 to +185 °F)
Humidity	-	Per MIL-STD 810
ESD	-	IEC 61000-4-2
Dust Resistance	-	IP6X
Water Resistance (Submersion)	-	IPX8 (2 meters, 4 hours) MIL-STD Delta-T, 512.X Procedure 1

REGULATORY			
	MODEL NUMBER	FCC ID	IC ID
7/800 MHZ	H35UCT9PW8AN	AZ489FT7147	109U-89FT7147
LMR		8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E, 20K0F1E	
Bluetooth		1M18G1D, 1M1F1D, 2M1F1D	
WiFi		12M9G1D, 16M7D1D, 17M9D1D, 36M2D1D, 17M5D1D, 18M4D1D, 36M8D1D, 76M1D1D	
LTE		Band 2 (1850.7 - 1910 MHz), Modulation: *G7D, *D7W Band 4 (1710.7 - 1755 MHz), Modulation: *G7D, *D7W Band 12 (699.7 - 716 MHz), Modulation: *G7D, *D7W Band 13: (777-787 MHz), Modulation *G7D, D7W Band 14 (788 - 798 MHz), Modulation: *G7D, *D7W Band 17 (704 - 716 MHz), Modulation: *G7D, *D7W	

1. Measured in the analog mode per TIA / EIA 603 under nominal conditions. Selectivity reflects newer 2-tone test method as defined in revision D TIA603-D issued in 2010.

2. Measured conductively in analog mode per TIA / EIA 603 under nominal conditions.

3. Measured conductively in digital mode per TIA / EIA IS 102.CAAA under nominal conditions.

4. Listed by UL to the standards ANSI/TIA 4950-A and CAN/CSA C22.2 NO. 157-92 Classification Rating: Class I, Division 1, Groups C, D; Class II, Division 1, Group E, F, G; Class III, Hazardous (Classified) Locations. ANSI/ISA 12.12.01-2015 and CAN/CSA C22.2 No. 213-15; Class I, Division 2, Groups A, B, C, D; T3C

5. Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength. Specs provided are 95th percentile values.

6. LMR only. Front display, LTE, WiFi, Bluetooth and GPS not available when radio internal temperature is below -20 °C (-4 °F). HAZLOC rated, UL Div 1, TIA 4950-A or Hi capacity battery required for operation between -20 °C (-4 °F) and -30 °C (-22 °F). Batteries should be charged at 0 to +45 °C (+32 to +113 °F) and stored at +20 to +25 °C (+68 to +77 °F)

All specifications shown are typical. Specifications are subject to change without notice.

To learn more, visit: www.motorolasolutions.com/apxn70xe

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City of Fort Lauderdale

Attachment 45 - End-of-Support/End-of-Life Product List

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.42.2.2 End-of-Support/End-of-Life Product List

Lifecycle Roadmap

Motorola Solutions is committed to supporting the ASTRO 25 platform for an extended period of time. To sustain the platform lifespan, Motorola Solutions makes ongoing investments to refresh the underlying hardware and software components to address technology advancement and apply security safeguards. Certain system components are expected to undergo more regular updates, while others are expected to be available for an extended period from initial availability. A primary goal of technology refresh is to maximize backwards compatibility thereby mitigating the need to replace the entire platform.

Although there is no planned end of life date, the ASTRO 25 platform and subsystem components will need to be maintained at the minimum supported version to ensure extended years of supportability and serviceability.

Motorola Solutions has a regular release cycle for ASTRO A20YY.R platform system release software that is typically released to market once a year. System software releases minimally include Software Protection and Enhancements, and Migration and Upgrade Support. Motorola Solutions has a variable release cadence for Optional Features, Standards and Regulatory, and Continuity of Supply based on market need and technology refresh requirements.

	A2021.1 January 13, 2021	A2022.1 / A2022.HS Q4 2022	A2024.1 / A2024.HS & BEYOND Q1 2024 +
NEW FEATURES AND CAPABILITIES	**MISSION CRITICAL SOLUTIONS** • Optional Features - See Feature Roadmap **FUTURE-READY PLATFORM** • A7.18 Upgrade Path • A2019.2 Upgrade Path • Mandatory Standards and Regulatory • Monthly or Quarterly Patching • Cyber IA BaseLine Assurance • 4 Years Standard Support from Release Date	**MISSION CRITICAL SOLUTIONS*** • Optional Features - See Feature Roadmap **FUTURE-READY PLATFORM*** • A2020.1 / A2020.HS Upgrade Path • A2021.1 Upgrade Path • Mandatory Standards and Regulatory • Monthly or Quarterly Patching • Cyber IA BaseLine Assurance • 4 Years Standard Support from Release Date • CAC/PIV Support (A2022.HS)	**MISSION CRITICAL SOLUTIONS*** • Optional Features **FUTURE-READY PLATFORM*** • A2022.X Upgrade Path • Mandatory Standards and Regulatory • Monthly or Quarterly Patching • Cyber IA BaseLine Assurance • CAC/PIV Support (A2024.HS)
CONTINUITY OF SUPPLY	**CORE PLATFORM** • ESXi 7.0 • SLC 8000 Terminal Server	**CORE PLATFORM** • **RHEL 8.X** • McAfee ENS for Linux 10.7.x • Python 3.x **SITE EQUIPMENT** • MCG 8000 (CCGW Replacement) • Juniper FW Replacement • ETI (IP PBX Server) • VPS (Trunking GCM Replacement)	**CORE PLATFORM*** • Software Refresh • Hardware Refresh • Product Refresh *** Not Delivered in every release, depending on product life cycle support requirements and market needs.** *For Information Only. Subject to change as MSI's discretion.* © 2021 Motorola Solutions, Inc.

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The table below shows the year Motorola Solutions released each item to the market. Currently, we have no known cancellation date or notice of cancellation date for any of these components.

ProductProduct	Introduced	Cancellation
CSA Server DL 380 Gen 10	November 2019	Unknown
Seagate 4005 DAS	November 2019	Unknown
GTR 8000 Base Station	June 2013	Unknown
GCM 8000 Comparator	June 2013	Unknown
GCP 8000 Site Controller	June 2013	Unknown
APX NEXT Portable	October 2019	Unknown
APX NEXT XE Portable	September 2020	Unknown
APX N70 Portable	December 2022	Unknown
APX N50 Portable	October 2022	Unknown
APX N30 Portable	October 2022	Unknown
APX 1500 Mobile	October 2019	Unknown
APX 4500 Mobile	October 2019	Unknown
APX 6500 Mobile	October 2019	Unknown
APX 8500 Mobile	December 2016	Unknown

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Attachment 46 - CAP Certification Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.42.3.1 APCO P25 Related Specifications

CAP Certification documentation is provided on the following pages.

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PRODUCT UNDER TEST

CAP Approval 20240823

Product Info	Details
Model_Name:	**APX 4500BN, APX 4500 CN**
Hardware Capability/Options:	Full Display; VHF (136-174MHz); UHF-R1 (380-470MHz); UHF-R2 (450-520MHz); 700MHz (764-776, 794-806 MHz); 800MHz (806-824, 851-870 MHz); 900MHz (896-902, 935-940 MHz)
Software Options:	P25 Conventional, P25 Trunked, P25 TDMA Trunked, AES-256 Encryption

TEST CASE RESULT NOTATIONS AND DEFINITIONS (Vendors may define additional notations/definitions)

Notation	Test Case Result Definition
P (Pass)	Test was passed and met stated requirements where listed
P1	Functionality requires product with DTMF keypad
P2	Functionality requires product with display capable of ID display
P3	Functionality requires DTMF microphone
P4	Functionality requires AES 256 encryption
P5	Interoperability verified with only one representative base station repeater
P6	Interoperability verified with only two representative base station repeaters
P7	Test was passed based on TIA-102.CABA-A (test cases 2.2.8.4.1 and 2.4.14.4.1) which allows a subscriber to always unmute with $F7E NAC.
U (Unsupported)	Test examines functionality the Product Under Test does not support
U1	37.5 millisecond slot times is not supported
U2	45 millisecond slot times is not supported
U3	Functionality is not supported by subscriber unit
U4	Functionality is not supported by the representative base station repeater tested with the subscriber under test
U5	Functionality is not supported by the representative subscriber unit tested with the subscriber under test
E (Exception)	DHS OIC Approved Test Case Exception
E1	In accordance with the guidance given in TIA 102.CAAB-D §3.2.18, if the transmitter carrier output power rating is 6 watts or less, the mean frequency difference during t1 and t3, may be greater than ±12.5 kHz.
F (Fail)	Test was failed and did not meet stated requirements where listed

Conventional Subscriber Performance (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.1 – Conventional Subscriber Unit Performance
Detailed Test Report Identification
[DTR-P25CAP-3580] DTR-P25CAP-3731, [DTR-P25CAP-3739] [DTR-P25CAP-3771]

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Conventional Subscriber Unit Receiver Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*P*	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*P*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*P*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*P*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*P*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*P*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*P*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*P*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*P*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*P*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*P*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*P*	*P*	*P*	*P*	*P*
3.1.17	Late Entry Unsquelch Delay: No Talk Group or Encryption	≤ 125 ms	*P*	*P*	*P*	*P*	*P*
3.1.18	Receiver Throughput Delay	≤ 125 ms	*P*	*P*	*P*	*P*	*P*

Conventional Subscriber Unit Transmitter Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*P*	*P*	*P*	*P*	*P*
3.2.12	Transmitter Attack Time	≤ 50 ms	*P*	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*P*	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*P*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*P*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*P*	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*P*	*P*	*P*	*P*	*P*
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	$\lvert\Delta f\rvert \leq 12.5$ kHz	[t1=5ms] *P*	[t1=10ms] *P*	[t1=10ms] *P*	[t1=20ms] P	[t1=20ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	$\lvert\Delta f\rvert \leq 6.25$ kHz	[t2=20ms] *P*	[t2=25ms] *P*	[t2=25ms] *P*	[t2=50ms] *P*	[t2=50ms] *P*

3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	[t3=5ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Performance - FDMA (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.2 – Trunked Subscriber Unit Performance - FDMA
Detailed Test Report Identification
[DTR-P25CAP-3580] DTR-P25CAP-3731, [DTR-P25CAP-3739] [DTR-P25CAP-3771]

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Trunked Subscriber Unit Receiver Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	P	P	P	P	P
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	P	P	P	P	P
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	P	P	P	P	P
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	P	P	P	P	P
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	P	P	P	P	P
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	P	P	P	P	P
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	P	P	P	P	P
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	P	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	P	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	P	P	P	P	P
3.1.8	Co-Channel Rejection	≤ 9 dB	P	P	P	P	P
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P	P	P	P	P

Trunked Subscriber Unit Transmitter Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	P	P	P	P	P
3.2.12	Power Attack Time	≤ 50 ms	P	P	P	P	P
3.2.12	Encoder Attack Time	≤ 100 ms	P	P	P	P	P
3.2.14	Transmitter Throughput Delay	≤ 125 ms	P	P	P	P	P
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	P	P	P	P	P
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	P	P	P	P	P
3.2.16	Modulation Fidelity – C4FM	≤ 5%	P	P	P	P	P
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	|Δf| ≤ 12.5 kHz	[t1=5ms] P	[t1=10ms] P	[t1=10ms] P	[t1=20ms] P	[t1=20ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	[t2=20ms] P	[t2=25ms] P	[t2=25ms] P	[t2=50ms] P	[t2=50ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	[t3=5ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Unit Trunked Tests - FDMA (2018 CAB)

Test Case	Test Case Description	Requirement	Result
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 4.15$ ms	P
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 4.15$ ms	P
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Turn Off Time	≤ 1.57 ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 11.65$ ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 11.65$ ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Turn Off Time	≤ 1.57 ms	P
3.3.2	Trunked Request Time - 37.5 ms Slot	≤ 160 ms	P
3.3.2	Trunked Request Time - 45 ms Slot	≤ 167.5 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form RF Transmitter time to Key on a Working Channel	≤ 150.0 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form Encoder Transmit Time	≤ 150.0 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form RF Transmitter Time to Key on a Working Channel	≤ 171.1 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form Encoder Transmit Time	≤ 171.1 ms	P

Trunked Subscriber Performance - TDMA (2018 CAB)
Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.3 - Trunked Subscriber Unit Performance - TDMA
Detailed Test Report Identification
[DTR-P25CAP-3580] DTR-P25CAP-3731, [DTR-P25CAP-3739] [DTR-P25CAP-3771]

(leave test section empty for 2016 CAB)

The 'test case' number refers to the paragraph number for the test procedure found in TIA-102.CCAA-B Two-Slot Time Division Multiple Access Transceiver Measurement Methods for TDMA.

Trunked Subscriber Unit Receiver Tests - TDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity - HDQPSK	≤ -116 dBm	P	P	P	P	P
3.1.5	Faded Reference Sensitivity - HDQPSK	≤ -108 dBm	P	P	P	P	P
3.1.6	Signal Delay Spread Capability - HDQPSK	≥ 65 µs	P	P	P	P	P
3.1.7.1	Adjacent Channel Rejection - HDQPSK	≥ 60 dB	P	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection - HDQPSK	≥ 47 dB	P	P	P	P	P
3.1.8	Co-Channel Rejection	≤ 9 dB	P	P	P	P	P
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P	P	P	P	P

Trunked Subscriber Unit Transmitter Tests - TDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 65 dB (non-700MHz)	P	P	P	P	P
3.2.12	Frequency Deviation H-CPM – High level Signal	$2995 < f_{dev} \leq 3310$ Hz	P	P	P	P	P
3.2.12	Frequency Deviation H-CPM – Low Level Signal	$998 < f_{dev} \leq 1104$ Hz	P	P	P	P	P
3.2.13	Modulation Fidelity	≤ 5%	P	P	P	P	P
3.2.14	Symbol Rate Accuracy	Not to exceed 10 parts per million	P	P	P	P	P
3.2.15	H-CPM Transmitter Logical Channel Peak Adjacent Channel Power Ratio	≥ 35 dB	P	P	P	P	P
3.2.16	H-CPM Transmitter Logical Channel Off Slot Power	≤ -57dBm	P	P	P	P	P
3.2.17	H-CPM Transmitter Logical Channel Power Envelop						
3.2.17	Max - On	4 dBc	P	P	P	P	P
3.2.17	Slot Max	1 dBc	P	P	P	P	P
3.2.17	Slot Min	-3 dBc	P	P	P	P	P
3.2.17	Max - Off	4 dBc	P	P	P	P	P
3.2.18	H-CPM Transmitter Logical Channel Time Alignment	±25 microseconds or less	P	P	P	P	P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Conventional Subscriber Unit Interoperability - Direct Mode (2018 CAB)
Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.3.1 - Conventional Subscriber Unit Interoperability – Direct Mode

Representative Conventional Subscriber Unit Products tested with the Subscriber Unit for Conventional Interoperability - Direct Mode

Subscriber Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	APX8000	1	DTR-P25CAP081011-P1850004-DMO-A
EF Johnson Technologies	Viking VP900	2	DTR-P25CAP081010-18052403
Harris Corporation	XL-200P	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - Direct Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.2.1**	**Matching NAC Operation and SU Unaddressed Voice Call****			
2.2.1.4.1	Test Case 1 – Unaddressed Voice Call	P	P	P
2.2.2**	**Matching NAC Operation and SU Routine Group Voice Call****			
2.2.2.4.1	Test Case 1 – Routine Group Voice Call	P	P	P
2.2.3**	**Monitor Mode – SU Group Voice Call****			
2.2.3.4.1	Test Case 1 – Receiving Group Call	P	P	P
2.2.8**	**Accept Any NAC in Normal & Selective Squelch Mode – SU Group Voice Call****			
2.2.8.4.1	Test Case 1 – Receiving Group Call with Receive NAC $F7E under Normal and Selective Squelch Modes	P7	P7	P7
2.2.4	**Emergency Call**			
2.2.4.4.1	Test Case 1 – Emergency Call	P	P	P
2.2.5	**Unit-to-Unit Voice Call**			
2.2.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	P	P	P
2.2.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	P	P	P
2.2.6	**Unit-to-Unit Voice Call – Receiving Units also in Monitor Mode**			

2.2.6.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.6.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.7	**Encryption**			
2.2.7.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.3.1	**Call Alert**			
2.3.1.4.1	Test Case 1 – Call Alert (SU 1 to SU 5)	*P*	*P*	*U5*
2.3.1.4.2	Test Case 2 – Call Alert (SU 5 to SU 1)	*P*	*P*	*U5*
2.3.2	**Radio Check**			
2.3.2.4.1	Test Case 1 – Radio Check (SU 1 to SU 5)	*U*	*U*	*U*
2.3.2.4.2	Test Case 2 – Radio Check (SU 5 to SU 1)	*U*	*U*	*U*
2.3.3	**Message Update**			
2.3.3.4.1	Test Case 1 – Message Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.3.4.2	Test Case 2 – Message Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.4	**Status Update**			
2.3.4.4.1	Test Case 1 – Status Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.4.4.2	Test Case 2 – Status Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.5	**Status Query**			
2.3.5.4.1	Test Case 1 – Status Query (SU 1 to SU 5)	*U*	*U*	*U*
2.3.5.4.2	Test Case 2 – Status Query (SU 5 to SU 1)	*U*	*U*	*U*
2.3.6	**Radio Unit Monitor**			
2.3.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.3.6.4.2	Test Case 2 – Radio Unit Monitor Initiated by SU 5 – Group Call	*U*	*U*	*U*
2.3.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*
2.3.6.4.4	Test Case 4 – Radio Unit Monitor Initiated by SU 5 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.2 - Conventional Subscriber Unit Interoperability – Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-RMO-G
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests- Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.4.1**	**Matching NAC Operation and SU Unaddressed Voice Call ****			
2.4.1.4.1	Test Case 1 – Matching NAC operation – Unaddressed Voice Call	*P*	*P*	*P*
2.4.2**	**Matching NAC Operation – SU Routine Group Call Mode ****			
2.4.2.4.1	Test Case 1 – Matching NAC – SU Routine Group Call Mode	*P*	*P*	*P*
2.4.3	**Transmit NAC Independent of Receive NAC – SU Unaddressed Voice Call**			
2.4.3.4.1	Test Case 1 – Independent NAC Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.4	**Transmit NAC Independent of Receive NAC – SU Routine Group Call**			
2.4.4.4.1	Test Case 1 – Independent NAC Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.5	**Any NAC ($F7F) Operation – SU Unaddressed Voice Call**			
2.4.5.4.1	Test Case 1 – NAC $F7F Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.6	**Any NAC ($F7F) Operation – SU Routine Group Call**			
2.4.6.4.1	Test Case 1 – NAC $F7F Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.7	**Any NAC ($F7E) Operation with Fixed Transmit NAC – SU Group Call**			
2.4.7.4.1	Test Case 1 – NAC $F7E Operation – SU Group Call	*P*	*P*	*P*
2.4.8	**Emergency Call**			
2.4.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.4.9**	**Monitor Mode – SU Group Call ****			
2.4.9.4.1	Test Case 1 – Monitor Mode – Receiving Group Call	*P*	*P*	*P*
2.4.10	**Unit-to-Unit Voice Call**			
2.4.10.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.10.4.3	Test Case 3 – Initiate Unit-to-Unit Call from SU 1, No Co-Channel Interference Suppression	*P*	*P*	*P*
2.4.11	**Unit-to-Unit Voice Call Co-Channel Interference Suppression by FNE**			
2.4.11.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.12	**Unit-to-Unit Voice Call – Receiving Units Also in Monitor Mode**			
2.4.12.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.13	**Encryption**			
2.4.13.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.4.14	**Accept Any NAC in Normal and Selective Squelch Mode – SU Group Call**			
2.4.14.4.1	Test Case 1 – Receiving group Call with receive NAC $F7F under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.5.1	**Call Alert**			
2.5.1.4.1	Test Case 1 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.5.2	**Radio Check**			
2.5.2.4.1	Test Case 1 – Initiate Radio Check from SU 1	*U*	*U*	*U*

2.5.3	**Message Update**			
2.5.3.4.1	Test Case 1 – Message Update Initiated by SU 1	*U*	*U*	*U*
2.5.3.4.3	Test Case 3 – SU 1 to Group Message Update	*U*	*U*	*U*
2.5.4	**Status Update**			
2.5.4.4.1	Test Case 1 – Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.4.4.3	Test Case 3 – SU to Talk Group Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.5	**Status Query**			
2.5.5.4.1	Test Case 1 – Status Query Initiated by SU 1	*U*	*U*	*U*
2.5.6	**Radio Unit Monitor**			
2.5.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.5.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.3 - Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-DMC-G
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - FNE Dispatch Monitoring Console - Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.6.1	**Unaddressed Voice Call**			
2.6.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.6.2	**Routine Group Call**			
2.6.2.4.1	Test Case 1 – Routine Group Call	*P*	*P*	*P*
2.6.3	**Emergency Call**			
2.6.3.4.1	Test Case 1 – Emergency Call from SU	*P*	*P*	*P*
2.6.3.4.2	Test Case 2 – Emergency Call from DMC	*U4*	*U4*	*P*
2.6.4	**All Call (System-Wide Call)**			
2.6.4.4.1	Initiate System-Wide Call to Collection of Talk Groups	*P*	*P*	*U4*
2.6.5	**Unit-to-Unit Voice Call**			
2.6.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from DMC	*P*	*P*	*P*
2.6.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.6.6	**Encryption**			
2.6.6.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.7.1	**Emergency Alarm to Dispatch and/or other Monitoring Console**			
2.7.1.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*
2.7.2	**Call Alert**			
2.7.2.4.1	Test Case 1 – Initiate Call Alert Request from DMC	*P*	*P*	*U4*
2.7.2.4.2	Test Case 2 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.7.3	**Radio Check**			
2.7.3.4.1	Test Case 1 – Initiate Radio Check from DMC	*P*	*U4*	*U4*
2.7.4	**Radio Unit Inhibit**			
2.7.4.4.1	Test Case 1 – Radio Unit Inhibit from DMC	*P*	*U4*	*U4*
2.7.5	**Radio Unit Uninhibit**			
2.7.5.4.1	Test Case 1 – Radio Unit Uninhibit from DMC	*P*	*U4*	*U4*
2.7.6	**Message Update**			
2.7.6.4.1	Test Case 1 – Message Update from DMC	*U*	*U4*	*U4*
2.7.6.4.2	Test Case 2 – DMC to Group Message Update	*U*	*U*	*U4*
2.7.6.4.3	Test Case 3 – SU 1 to DMC Message Update	*U*	*U*	*U*
2.7.6.4.4	Test Case 4 – SU 1 to Group Message Update	*P*	*U*	*U4*
2.7.7	**Status Update**			
2.7.7.4.1	Test Case 1 – Status Update from SU 1 to DMC	*U*	*U*	*U*
2.7.7.4.2	Test Case 2 – Talk Group Status Update Initiated by SU 1	*P*	*U*	*U4*
2.7.8	**Status Query**			
2.7.8.4.1	Test Case 1 – Status Query Initiated by DMC	*P*	*U*	*U4*
2.7.9	**Radio Unit Monitor**			
2.7.9.4.1	Test Case 1 – Radio Unit Monitor Initiated by DMC – Group Call	*P*	*U*	*U4*
2.7.9.4.2	Test Case 2 – Radio Unit Monitor Initiated by DMC – Unit-to-Unit Call	*U*	*U*	*U4*

Trunked Subscriber Unit Interoperability - FDMA (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.4 - Trunked Subscriber Unit Interoperability – FDMA (Phase 1)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - FDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-FDMA-
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-09111601; DTR-P2
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M; DTR-P

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - FDMA (2016&2017 CAB)

***Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.2	Test Case 2 – Denied or Refused Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.3	Test Case 3 – Unverified Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.2	Test Case 2 – Group Call Denied	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.4	*** Test Case 4 – Group Call Interrupt ***	*P*	*P*	*P*				*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.2	Test Case 2 - Unit-to-Unit Call with Target Availability Check- Denied by Target	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.7	Test Case 7 – Unit-to-Unit Call Denied	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5	**Affiliation**									
2.2.5.4.1	Test Case 1 – Radio Permitted to Affiliate with New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5.4.2	Test Case 2 – Radio Denied Affiliation to New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.7	**Emergency Alarm**									
2.2.7.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.11	**Intra-Location Registration Area Roaming**									
2.2.11.4.1	Test Case 1 – Idle Radio	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.13	**Deregistration *** **									
2.2.13.4.1	Test Case 1 – Deregistration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call *** **									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*
2.2.15	**Call Alert *** **									
2.2.15.4.1	Test Case 1 – Call Alert	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.16	**Short Message *** **									
2.2.16.4.1	Test Case 1 – Short Message	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.17	**Status Query *** **									
2.2.17.4.1	Test Case 1 – Status Query	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.18	**Status Update *** **									
2.2.18.4.1	Test Case 1 – Status Update	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.19	**Radio Unit Monitoring *** **									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.20	**Radio Unit Disable/Re-Enable *** **									
2.2.20.4.1	Test Case 1 – Radio Unit Disable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.20.4.2	Test Case 2 – Radio Unit Re-Enable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.21	**Radio Check *** **									
2.2.21.4.1	Test Case 1 – Radio Check Successful	*P*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*

*** Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Trunked Subscriber Unit Interoperability - TDMA (2017 CAB)	(leave test section empty for 2016 CAB)
CAB Test Section Identification	
P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.5 - Trunked Subscriber Unit Interoperability – TDMA (Phase 2)	

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - TDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #

Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-TDMA-
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18111101
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number inTIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - TDMA (2017 CAB)

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.4	Test Case 4 – Group Call Interrupt	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call**									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19	**Radio Unit Monitoring**									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26	**Transmitting Subscriber Forced Preemption**									
2.2.26.4.1	Test Case 1 – TDMA SU Forced Audio Preemption	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26.4.2	Test Case 2 – TDMA SU Forced Emergency Call Ruthless Preemption	*P*	*P*	*P*	*U4*	*U4*	*U4*	*P*	*P*	*U4*

PRODUCT UNDER TEST

CAP Approval 20240823

Product Info	Details
Model_Name:	**APX 6500Li, APX 6500BN**
Hardware Capability/Options:	Full Display; VHF (136-174MHz); UHF-R1 (380-470MHz); UHF-R2 (450-520MHz); 700MHz (764-776MHz); 800MHz (851-870MHz), 900 MHz.
Software Options:	P25 Conventional, P25 Trunked, P25 TDMA Trunked, AES-256 Encryption

TEST CASE RESULT NOTATIONS AND DEFINITIONS (Vendors may define additional notations/definitions)

Notation	Test Case Result Definition
P (Pass)	Test was passed and met stated requirements where listed
P1	Functionality requires product with DTMF keypad
P2	Functionality requires product with display capable of ID display
P3	Functionality requires DTMF microphone
P4	Functionality requires AES 256 encryption
P5	Interoperability verified with only one representative base station repeater
P6	Interoperability verified with only two representative base station repeaters
P7	Test was passed based on TIA-102.CABA-A (test cases 2.2.8.4.1 and 2.4.14.4.1) which allows a subscriber to always unmute with $F7E NAC.
U (Unsupported)	Test examines functionality the Product Under Test does not support
U1	37.5 millisecond slot times is not supported
U2	45 millisecond slot times is not supported
U3	Functionality is not supported by subscriber unit
U4	Functionality is not supported by the representative base station repeater tested with the subscriber under test
U5	Functionality is not supported by the representative subscriber unit tested with the subscriber under test
E (Exception)	DHS OIC Approved Test Case Exception
E1	In accordance with the guidance given in TIA 102.CAAB-D §3.2.18, if the transmitter carrier output power rating is 6 watts or less, the mean frequency difference during t1 and t3, may be greater than ±12.5 kHz.
F (Fail)	Test was failed and did not meet stated requirements where listed

Conventional Subscriber Performance (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.1 – Conventional Subscriber Unit Performance
Detailed Test Report Identification
[DTR-P25CAP-3591][DTR-P25CAP-3674 (700-800MHz)] [DTR-P25CAP-3771]

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Conventional Subscriber Unit Receiver Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*P*	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*P*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*P*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*P*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*P*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*P*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*P*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*P*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*P*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*P*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*P*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*P*	*P*	*P*	*P*	*P*
3.1.17	Late Entry Unsquelch Delay: No Talk Group or Encryption	≤ 125 ms	*P*	*P*	*P*	*P*	*P*
3.1.18	Receiver Throughput Delay	≤ 125 ms	*P*	*P*	*P*	*P*	*P*

Conventional Subscriber Unit Transmitter Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*P*	*P*	*P*	*P*	*P*
3.2.12	Transmitter Attack Time	≤ 50 ms	*P*	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*P*	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*P*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*P*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*P*	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*P*	*P*	*P*	*P*	*P*
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	$\lvert\Delta f\rvert \leq 12.5$ kHz	[t1=5ms] *P*	[t1=10ms] *P*	[t1=10ms] *P*	[t1=20ms] P	[t1=20ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	$\lvert\Delta f\rvert \leq 6.25$ kHz	[t2=20ms] *P*	[t2=25ms] *P*	[t2=25ms] *P*	[t2=50ms] *P*	[t2=50ms] *P*

3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	[t3=5ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Performance - FDMA (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.2 – Trunked Subscriber Unit Performance - FDMA
Detailed Test Report Identification
[DTR-P25CAP-3591][DTR-P25CAP-3674 (700-800MHz)] [DTR-P25CAP-3771]

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Trunked Subscriber Unit Receiver Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	P	P	P	P	P
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	P	P	P	P	P
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	P	P	P	P	P
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	P	P	P	P	P
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	P	P	P	P	P
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	P	P	P	P	P
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	P	P	P	P	P
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	P	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	P	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	P	P	P	P	P
3.1.8	Co-Channel Rejection	≤ 9 dB	P	P	P	P	P
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P	P	P	P	P

Trunked Subscriber Unit Transmitter Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	P	P	P	P	P
3.2.12	Power Attack Time	≤ 50 ms	P	P	P	P	P
3.2.12	Encoder Attack Time	≤ 100 ms	P	P	P	P	P
3.2.14	Transmitter Throughput Delay	≤ 125 ms	P	P	P	P	P
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	P	P	P	P	P
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	P	P	P	P	P
3.2.16	Modulation Fidelity – C4FM	≤ 5%	P	P	P	P	P
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	|Δf| ≤ 12.5 kHz	[t1=5ms] P	[t1=10ms] P	[t1=10ms] P	[t1=20ms] P	[t1=20ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	[t2=20ms] P	[t2=25ms] P	[t2=25ms] P	[t2=50ms] P	[t2=50ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	[t3=5ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Unit Trunked Tests - FDMA (2018 CAB)

Test Case	Test Case Description	Requirement	Result
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 4.15$ ms	P
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 4.15$ ms	P
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Turn Off Time	≤ 1.57 ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 11.65$ ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 11.65$ ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Turn Off Time	≤ 1.57 ms	P
3.3.2	Trunked Request Time - 37.5 ms Slot	≤ 160 ms	P
3.3.2	Trunked Request Time - 45 ms Slot	≤ 167.5 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form RF Transmitter time to Key on a Working Channel	≤ 150.0 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form Encoder Transmit Time	≤ 150.0 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form RF Transmitter Time to Key on a Working Channel	≤ 171.1 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form Encoder Transmit Time	≤ 171.1 ms	P

Trunked Subscriber Performance - TDMA (2018 CAB)
Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.3 - Trunked Subscriber Unit Performance - TDMA
Detailed Test Report Identification
[DTR-P25CAP-3591][DTR-P25CAP-3674 (700-800MHz)] [DTR-P25CAP-3771]

(leave test section empty for 2016 CAB)

The 'test case' number refers to the paragraph number for the test procedure found in TIA-102.CCAA-B Two-Slot Time Division Multiple Access Transceiver Measurement Methods for TDMA.

Trunked Subscriber Unit Receiver Tests - TDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity - HDQPSK	≤ -116 dBm	P	P	P	P	P
3.1.5	Faded Reference Sensitivity - HDQPSK	≤ -108 dBm	P	P	P	P	P
3.1.6	Signal Delay Spread Capability - HDQPSK	≥ 65 µs	P	P	P	P	P
3.1.7.1	Adjacent Channel Rejection - HDQPSK	≥ 60 dB	P	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection - HDQPSK	≥ 47 dB	P	P	P	P	P
3.1.8	Co-Channel Rejection	≤ 9 dB	P	P	P	P	P
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	P	P	P	P	P
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P	P	P	P	P

Trunked Subscriber Unit Transmitter Tests - TDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 65 dB (non-700MHz)	P	P	P	P	P
3.2.12	Frequency Deviation H-CPM – High level Signal	$2995 < f_{dev} \leq 3310$ Hz	P	P	P	P	P
3.2.12	Frequency Deviation H-CPM – Low Level Signal	$998 < f_{dev} \leq 1104$ Hz	P	P	P	P	P
3.2.13	Modulation Fidelity	≤ 5%	P	P	P	P	P
3.2.14	Symbol Rate Accuracy	Not to exceed 10 parts per million	P	P	P	P	P
3.2.15	H-CPM Transmitter Logical Channel Peak Adjacent Channel Power Ratio	≥ 35 dB	P	P	P	P	P
3.2.16	H-CPM Transmitter Logical Channel Off Slot Power	≤ -57dBm	P	P	P	P	P
3.2.17	H-CPM Transmitter Logical Channel Power Envelop						
3.2.17	Max - On	4 dBc	P	P	P	P	P
3.2.17	Slot Max	1 dBc	P	P	P	P	P
3.2.17	Slot Min	-3 dBc	P	P	P	P	P
3.2.17	Max - Off	4 dBc	P	P	P	P	P
3.2.18	H-CPM Transmitter Logical Channel Time Alignment	±25 microseconds or less	P	P	P	P	P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Conventional Subscriber Unit Interoperability - Direct Mode (2018 CAB)
Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.3.1 - Conventional Subscriber Unit Interoperability – Direct Mode

Representative Conventional Subscriber Unit Products tested with the Subscriber Unit for Conventional Interoperability - Direct Mode

Subscriber Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	APX8000	1	DTR-P25CAP081011-P1850004-DMO-A
EF Johnson Technologies	Viking VP900	2	DTR-P25CAP081010-18052403
Harris Corporation	XL-200P	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - Direct Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.2.1**	**Matching NAC Operation and SU Unaddressed Voice Call****			
2.2.1.4.1	Test Case 1 – Unaddressed Voice Call	P	P	P
2.2.2**	**Matching NAC Operation and SU Routine Group Voice Call****			
2.2.2.4.1	Test Case 1 – Routine Group Voice Call	P	P	P
2.2.3**	**Monitor Mode – SU Group Voice Call****			
2.2.3.4.1	Test Case 1 – Receiving Group Call	P	P	P
2.2.8**	**Accept Any NAC in Normal & Selective Squelch Mode – SU Group Voice Call****			
2.2.8.4.1	Test Case 1 – Receiving Group Call with Receive NAC $F7E under Normal and Selective Squelch Modes	P7	P7	P7
2.2.4	**Emergency Call**			
2.2.4.4.1	Test Case 1 – Emergency Call	P	P	P
2.2.5	**Unit-to-Unit Voice Call**			
2.2.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	P	P	P
2.2.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	P	P	P
2.2.6	**Unit-to-Unit Voice Call – Receiving Units also in Monitor Mode**			

2.2.6.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.6.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.7	**Encryption**			
2.2.7.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.3.1	**Call Alert**			
2.3.1.4.1	Test Case 1 – Call Alert (SU 1 to SU 5)	*P*	*P*	*U5*
2.3.1.4.2	Test Case 2 – Call Alert (SU 5 to SU 1)	*P*	*P*	*U5*
2.3.2	**Radio Check**			
2.3.2.4.1	Test Case 1 – Radio Check (SU 1 to SU 5)	*U*	*U*	*U*
2.3.2.4.2	Test Case 2 – Radio Check (SU 5 to SU 1)	*U*	*U*	*U*
2.3.3	**Message Update**			
2.3.3.4.1	Test Case 1 – Message Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.3.4.2	Test Case 2 – Message Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.4	**Status Update**			
2.3.4.4.1	Test Case 1 – Status Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.4.4.2	Test Case 2 – Status Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.5	**Status Query**			
2.3.5.4.1	Test Case 1 – Status Query (SU 1 to SU 5)	*U*	*U*	*U*
2.3.5.4.2	Test Case 2 – Status Query (SU 5 to SU 1)	*U*	*U*	*U*
2.3.6	**Radio Unit Monitor**			
2.3.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.3.6.4.2	Test Case 2 – Radio Unit Monitor Initiated by SU 5 – Group Call	*U*	*U*	*U*
2.3.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*
2.3.6.4.4	Test Case 4 – Radio Unit Monitor Initiated by SU 5 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.2 - Conventional Subscriber Unit Interoperability – Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-RMO-G
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests- Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.4.1**	**Matching NAC Operation and SU Unaddressed Voice Call ****			
2.4.1.4.1	Test Case 1 – Matching NAC operation – Unaddressed Voice Call	*P*	*P*	*P*
2.4.2**	**Matching NAC Operation – SU Routine Group Call Mode ****			
2.4.2.4.1	Test Case 1 – Matching NAC – SU Routine Group Call Mode	*P*	*P*	*P*
2.4.3	**Transmit NAC Independent of Receive NAC – SU Unaddressed Voice Call**			
2.4.3.4.1	Test Case 1 – Independent NAC Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.4	**Transmit NAC Independent of Receive NAC – SU Routine Group Call**			
2.4.4.4.1	Test Case 1 – Independent NAC Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.5	**Any NAC ($F7F) Operation – SU Unaddressed Voice Call**			
2.4.5.4.1	Test Case 1 – NAC $F7F Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.6	**Any NAC ($F7F) Operation – SU Routine Group Call**			
2.4.6.4.1	Test Case 1 – NAC $F7F Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.7	**Any NAC ($F7E) Operation with Fixed Transmit NAC – SU Group Call**			
2.4.7.4.1	Test Case 1 – NAC $F7E Operation – SU Group Call	*P*	*P*	*P*
2.4.8	**Emergency Call**			
2.4.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.4.9**	**Monitor Mode – SU Group Call ****			
2.4.9.4.1	Test Case 1 – Monitor Mode – Receiving Group Call	*P*	*P*	*P*
2.4.10	**Unit-to-Unit Voice Call**			
2.4.10.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.10.4.3	Test Case 3 – Initiate Unit-to-Unit Call from SU 1, No Co-Channel Interference Suppression	*P*	*P*	*P*
2.4.11	**Unit-to-Unit Voice Call Co-Channel Interference Suppression by FNE**			
2.4.11.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.12	**Unit-to-Unit Voice Call – Receiving Units Also in Monitor Mode**			
2.4.12.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.13	**Encryption**			
2.4.13.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.4.14	**Accept Any NAC in Normal and Selective Squelch Mode – SU Group Call**			
2.4.14.4.1	Test Case 1 – Receiving group Call with receive NAC $F7F under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.5.1	**Call Alert**			
2.5.1.4.1	Test Case 1 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.5.2	**Radio Check**			
2.5.2.4.1	Test Case 1 – Initiate Radio Check from SU 1	*U*	*U*	*U*

2.5.3	**Message Update**			
2.5.3.4.1	Test Case 1 – Message Update Initiated by SU 1	*U*	*U*	*U*
2.5.3.4.3	Test Case 3 – SU 1 to Group Message Update	*U*	*U*	*U*
2.5.4	**Status Update**			
2.5.4.4.1	Test Case 1 – Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.4.4.3	Test Case 3 – SU to Talk Group Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.5	**Status Query**			
2.5.5.4.1	Test Case 1 – Status Query Initiated by SU 1	*U*	*U*	*U*
2.5.6	**Radio Unit Monitor**			
2.5.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.5.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.3 - Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-DMC-G
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - FNE Dispatch Monitoring Console - Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.6.1	**Unaddressed Voice Call**			
2.6.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.6.2	**Routine Group Call**			
2.6.2.4.1	Test Case 1 – Routine Group Call	*P*	*P*	*P*
2.6.3	**Emergency Call**			
2.6.3.4.1	Test Case 1 – Emergency Call from SU	*P*	*P*	*P*
2.6.3.4.2	Test Case 2 – Emergency Call from DMC	*U4*	*U4*	*P*
2.6.4	**All Call (System-Wide Call)**			
2.6.4.4.1	Initiate System-Wide Call to Collection of Talk Groups	*P*	*P*	*U4*
2.6.5	**Unit-to-Unit Voice Call**			
2.6.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from DMC	*P*	*P*	*P*
2.6.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.6.6	**Encryption**			
2.6.6.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.7.1	**Emergency Alarm to Dispatch and/or other Monitoring Console**			
2.7.1.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*
2.7.2	**Call Alert**			
2.7.2.4.1	Test Case 1 – Initiate Call Alert Request from DMC	*P*	*P*	*U4*
2.7.2.4.2	Test Case 2 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.7.3	**Radio Check**			
2.7.3.4.1	Test Case 1 – Initiate Radio Check from DMC	*P*	*U4*	*U4*
2.7.4	**Radio Unit Inhibit**			
2.7.4.4.1	Test Case 1 – Radio Unit Inhibit from DMC	*P*	*U4*	*U4*
2.7.5	**Radio Unit Uninhibit**			
2.7.5.4.1	Test Case 1 – Radio Unit Uninhibit from DMC	*P*	*U4*	*U4*
2.7.6	**Message Update**			
2.7.6.4.1	Test Case 1 – Message Update from DMC	*U*	*U4*	*U4*
2.7.6.4.2	Test Case 2 – DMC to Group Message Update	*U*	*U*	*U4*
2.7.6.4.3	Test Case 3 – SU 1 to DMC Message Update	*U*	*U*	*U*
2.7.6.4.4	Test Case 4 – SU 1 to Group Message Update	*P*	*U*	*U4*
2.7.7	**Status Update**			
2.7.7.4.1	Test Case 1 – Status Update from SU 1 to DMC	*U*	*U*	*U*
2.7.7.4.2	Test Case 2 – Talk Group Status Update Initiated by SU 1	*P*	*U*	*U4*
2.7.8	**Status Query**			
2.7.8.4.1	Test Case 1 – Status Query Initiated by DMC	*P*	*U*	*U4*
2.7.9	**Radio Unit Monitor**			
2.7.9.4.1	Test Case 1 – Radio Unit Monitor Initiated by DMC – Group Call	*P*	*U*	*U4*
2.7.9.4.2	Test Case 2 – Radio Unit Monitor Initiated by DMC – Unit-to-Unit Call	*U*	*U*	*U4*

Trunked Subscriber Unit Interoperability - FDMA (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.4 - Trunked Subscriber Unit Interoperability – FDMA (Phase 1)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - FDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-FDMA-
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-09111601; DTR-P2
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M; DTR-P

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - FDMA (2016&2017 CAB)

***Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.2	Test Case 2 – Denied or Refused Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.3	Test Case 3 – Unverified Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.2	Test Case 2 – Group Call Denied	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.4	*** Test Case 4 – Group Call Interrupt ***	*P*	*P*	*P*				*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.2	Test Case 2 - Unit-to-Unit Call with Target Availability Check- Denied by Target	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.7	Test Case 7 – Unit-to-Unit Call Denied	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5	**Affiliation**									
2.2.5.4.1	Test Case 1 – Radio Permitted to Affiliate with New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5.4.2	Test Case 2 – Radio Denied Affiliation to New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.7	**Emergency Alarm**									
2.2.7.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.11	**Intra-Location Registration Area Roaming**									
2.2.11.4.1	Test Case 1 – Idle Radio	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.13	**Deregistration *** **									
2.2.13.4.1	Test Case 1 – Deregistration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call *** **									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*
2.2.15	**Call Alert *** **									
2.2.15.4.1	Test Case 1 – Call Alert	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.16	**Short Message *** **									
2.2.16.4.1	Test Case 1 – Short Message	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.17	**Status Query *** **									
2.2.17.4.1	Test Case 1 – Status Query	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.18	**Status Update *** **									
2.2.18.4.1	Test Case 1 – Status Update	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.19	**Radio Unit Monitoring *** **									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.20	**Radio Unit Disable/Re-Enable *** **									
2.2.20.4.1	Test Case 1 – Radio Unit Disable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.20.4.2	Test Case 2 – Radio Unit Re-Enable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.21	**Radio Check *** **									
2.2.21.4.1	Test Case 1 – Radio Check Successful	*P*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*

*** Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Trunked Subscriber Unit Interoperability - TDMA (2017 CAB)	(leave test section empty for 2016 CAB)
CAB Test Section Identification	
P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.5 - Trunked Subscriber Unit Interoperability – TDMA (Phase 2)	

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - TDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #

Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-TDMA-
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18111101
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number inTIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - TDMA (2017 CAB)

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.4	Test Case 4 – Group Call Interrupt	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call**									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19	**Radio Unit Monitoring**									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26	**Transmitting Subscriber Forced Preemption**									
2.2.26.4.1	Test Case 1 – TDMA SU Forced Audio Preemption	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26.4.2	Test Case 2 – TDMA SU Forced Emergency Call Ruthless Preemption	*P*	*P*	*P*	*U4*	*U4*	*U4*	*P*	*P*	*U4*

PRODUCT UNDER TEST

CAP Approval 20240823

Product Info	Details
Model_Name:	**APX N50**
Hardware Capability/Options:	700/800 MHz bandsplit (762-776, 792-806, 806-825, 851-870 MHz), UHF-R1 (380-470MHz); UHF-R2 (450-520MHz)
Software Options:	P25 Conventional, P25 Trunked, P25 TDMA Trunked, AES-256 Encryption

TEST CASE RESULT NOTATIONS AND DEFINITIONS (Vendors may define additional notations/definitions)

Notation	Test Case Result Definition
P (Pass)	Test was passed and met stated requirements where listed
P1	Functionality requires product with DTMF keypad
P2	Functionality requires product with display capable of ID display
P3	Functionality requires DTMF microphone
P4	Functionality requires AES 256 encryption
P5	Interoperability verified with only one representative base station repeater
P	Interoperability verified with only two representative base station repeaters
P7	Test was passed based on TIA-102.CABA-A (test cases 2.2.8.4.1 and 2.4.14.4.1) which allows a subscriber to always unmute with $F7E NAC.
U (Unsupported)	Test examines functionality the Product Under Test does not support
U1	37.5 millisecond slot times is not supported
U2	45 millisecond slot times is not supported
U3	Functionality is not supported by subscriber unit
U4	Functionality is not supported by the representative base station repeater tested with the subscriber under test
U5	Functionality is not supported by the representative subscriber unit tested with the subscriber under test
E (Exception)	DHS OIC Approved Test Case Exception
E1	In accordance with the guidance given in TIA 102.CAAB-D §3.2.18, if the transmitter carrier output power rating is 6 watts or less, the mean frequency difference during t1 and t3, may be greater than ±12.5 kHz.
F (Fail)	Test was failed and did not meet stated requirements where listed

Conventional Subscriber Performance (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.1 – Conventional Subscriber Unit Performance
Detailed Test Report Identification
DTR-P25CAP-3770, DTR-P25CAP-3848

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Conventional Subscriber Unit Receiver Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*N/A*	*P*	*P*	*P*	*P*
3.1.17	Late Entry Unsquelch Delay: No Talk Group or Encryption	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*
3.1.18	Receiver Throughput Delay	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*

Conventional Subscriber Unit Transmitter Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Transmitter Attack Time	≤ 50 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*N/A*	*P*	*P*	*P*	*P*
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	$\lvert\Delta f\rvert \leq 12.5$ kHz	*N/A*	[t1=10ms] *P*	[t1=10ms] *P*	[t1=20ms] *P*	[t1=20ms] *P*

3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	*N/A*	[t2=25ms] *P*	[t2=25ms] *P*	[t2=50ms] *P*	[t2=50ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	*N/A*	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Performance - FDMA (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.2 – Trunked Subscriber Unit Performance - FDMA
Detailed Test Report Identification
DTR-P25CAP-3770, DTR-P25CAP-3848

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Trunked Subscriber Unit Receiver Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*N/A*	*P*	*P*	*P*	*P*

Trunked Subscriber Unit Transmitter Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Power Attack Time	≤ 50 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*N/A*	*P*	*P*	*P*	*P*
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	|Δf| ≤ 12.5 kHz	N/A	[t1=10ms] *P*	[t1=10ms] *P*	[t1=20ms] *P*	[t1=20ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	N/A	[t2=25ms] *P*	[t2=25ms] *P*	[t2=50ms] *P*	[t2=50ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	N/A	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Unit Trunked Tests - FDMA (2018 CAB)

Test Case	Test Case Description	Requirement	Result
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 4.15$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 4.15$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Turn Off Time	≤ 1.57 ms	*P*
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 11.65$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 11.65$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Turn Off Time	≤ 1.57 ms	*P*
3.3.2	Trunked Request Time - 37.5 ms Slot	≤ 160 ms	*P*
3.3.2	Trunked Request Time - 45 ms Slot	≤ 167.5 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form RF Transmitter time to Key on a Working Channel	≤ 150.0 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form Encoder Transmit Time	≤ 150.0 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form RF Transmitter Time to Key on a Working Channel	≤ 171.1 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form Encoder Transmit Time	≤ 171.1 ms	*P*

Trunked Subscriber Performance - TDMA (2018 CAB)	(leave test section empty for 2016 CAB)
Test Identification	
P25-CAB-CAI_TEST_REQ –October 2018, Section 2.1.1.3 - Trunked Subscriber Unit Performance - TDMA	
Detailed Test Report Identification	
DTR-P25CAP-3770, DTR-P25CAP-3848	

The 'test case' number refers to the paragraph number for the test procedure found in TIA-102.CCAA-B Two-Slot Time Division Multiple Access Transceiver Measurement Methods for TDMA.

Trunked Subscriber Unit Receiver Tests - TDMA (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity - HDQPSK	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity - HDQPSK	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability - HDQPSK	≥ 65 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection - HDQPSK	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection - HDQPSK	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*N/A*	*P*	*P*	*P*	*P*

Trunked Subscriber Unit Transmitter Tests - TDMA (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 65 dB (non-700MHz)	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Frequency Deviation H-CPM – High level Signal	$2995 < f_{dev} \leq 3310$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Frequency Deviation H-CPM – Low Level Signal	$998 < f_{dev} \leq 1104$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.13	Modulation Fidelity	≤ 5%	*N/A*	*P*	*P*	*P*	*P*
3.2.14	Symbol Rate Accuracy	Not to exceed 10 parts per million	*N/A*	*P*	*P*	*P*	*P*
3.2.15	H-CPM Transmitter Logical Channel Peak Adjacent Channel Power Ratio	≥ 35 dB	*N/A*	*P*	*P*	*P*	*P*
3.2.16	H-CPM Transmitter Logical Channel Off Slot Power	≤ -57dBm	*N/A*	*P*	*P*	*P*	*P*
3.2.17	H-CPM Transmitter Logical Channel Power Envelop						
3.2.17	Max - On	4 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.17	Slot Max	1 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.17	Slot Min	-3 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.17	Max - Off	4 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.18	H-CPM Transmitter Logical Channel Time Alignment	±25 microseconds or less	*N/A*	*P*	*P*	*P*	*P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Conventional Subscriber Unit Interoperability - Direct Mode (2018 CAB)
Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.3.1 - Conventional Subscriber Unit Interoperability – Direct Mode

Representative Conventional Subscriber Unit Products tested with the Subscriber Unit for Conventional Interoperability - Direct Mode

Subscriber Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	APX8000	1	DTR-P25CAP081011-P1850004-DMO-J
EF Johnson Technologies	Viking VP900	2	DTR-P25CAP081010-18052403
Harris Corporation	XL-200P	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - Direct Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.2.1**	**Matching NAC Operation and SU Unaddressed Voice Call****			
2.2.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.2.2**	**Matching NAC Operation and SU Routine Group Voice Call****			
2.2.2.4.1	Test Case 1 – Routine Group Voice Call	*P*	*P*	*P*
2.2.3**	**Monitor Mode – SU Group Voice Call****			
2.2.3.4.1	Test Case 1 – Receiving Group Call	*P*	*P*	*P*
2.2.8**	**Accept Any NAC in Normal & Selective Squelch Mode – SU Group Voice Call****			
2.2.8.4.1	Test Case 1 – Receiving Group Call with Receive NAC $F7E under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.2.4	**Emergency Call**			
2.2.4.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.2.5	**Unit-to-Unit Voice Call**			

2.2.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.6	**Unit-to-Unit Voice Call – Receiving Units also in Monitor Mode**			
2.2.6.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.6.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.7	**Encryption**			
2.2.7.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.3.1	**Call Alert**			
2.3.1.4.1	Test Case 1 – Call Alert (SU 1 to SU 5)	*P*	*P*	*U5*
2.3.1.4.2	Test Case 2 – Call Alert (SU 5 to SU 1)	*P*	*P*	*U5*
2.3.2	**Radio Check**			
2.3.2.4.1	Test Case 1 – Radio Check (SU 1 to SU 5)	*U*	*U*	*U*
2.3.2.4.2	Test Case 2 – Radio Check (SU 5 to SU 1)	*U*	*U*	*U*
2.3.3	**Message Update**			
2.3.3.4.1	Test Case 1 – Message Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.3.4.2	Test Case 2 – Message Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.4	**Status Update**			
2.3.4.4.1	Test Case 1 – Status Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.4.4.2	Test Case 2 – Status Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.5	**Status Query**			
2.3.5.4.1	Test Case 1 – Status Query (SU 1 to SU 5)	*U*	*U*	*U*
2.3.5.4.2	Test Case 2 – Status Query (SU 5 to SU 1)	*U*	*U*	*U*
2.3.6	**Radio Unit Monitor**			
2.3.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.3.6.4.2	Test Case 2 – Radio Unit Monitor Initiated by SU 5 – Group Call	*U*	*U*	*U*
2.3.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*
2.3.6.4.4	Test Case 4 – Radio Unit Monitor Initiated by SU 5 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.2 - Conventional Subscriber Unit Interoperability – Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-RMO-(
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests- Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.4.1**	**Matching NAC Operation and SU Unaddressed Voice Call ****			
2.4.1.4.1	Test Case 1 – Matching NAC operation – Unaddressed Voice Call	*P*	*P*	*P*
2.4.2**	**Matching NAC Operation – SU Routine Group Call Mode ****			
2.4.2.4.1	Test Case 1 – Matching NAC – SU Routine Group Call Mode	*P*	*P*	*P*
2.4.3	**Transmit NAC Independent of Receive NAC – SU Unaddressed Voice Call**			
2.4.3.4.1	Test Case 1 – Independent NAC Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.4	**Transmit NAC Independent of Receive NAC – SU Routine Group Call**			
2.4.4.4.1	Test Case 1 – Independent NAC Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.5	**Any NAC ($F7F) Operation – SU Unaddressed Voice Call**			
2.4.5.4.1	Test Case 1 – NAC $F7F Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.6	**Any NAC ($F7F) Operation – SU Routine Group Call**			
2.4.6.4.1	Test Case 1 – NAC $F7F Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.7	**Any NAC ($F7E) Operation with Fixed Transmit NAC – SU Group Call**			
2.4.7.4.1	Test Case 1 – NAC $F7E Operation – SU Group Call	*P*	*P*	*P*
2.4.8	**Emergency Call**			
2.4.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.4.9**	**Monitor Mode – SU Group Call ****			
2.4.9.4.1	Test Case 1 – Monitor Mode – Receiving Group Call	*P*	*P*	*P*
2.4.10	**Unit-to-Unit Voice Call**			
2.4.10.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.10.4.3	Test Case 3 – Initiate Unit-to-Unit Call from SU 1, No Co-Channel Interference Suppression	*P*	*P*	*P*
2.4.11	**Unit-to-Unit Voice Call Co-Channel Interference Suppression by FNE**			
2.4.11.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.12	**Unit-to-Unit Voice Call – Receiving Units Also in Monitor Mode**			
2.4.12.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.13	**Encryption**			
2.4.13.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.4.14	**Accept Any NAC in Normal and Selective Squelch Mode – SU Group Call**			
2.4.14.4.1	Test Case 1 – Receiving group Call with receive NAC $F7F under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.5.1	**Call Alert**			

2.5.1.4.1	Test Case 1 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.5.2	**Radio Check**			
2.5.2.4.1	Test Case 1 – Initiate Radio Check from SU 1	*U*	*U*	*U*
2.5.3	**Message Update**			
2.5.3.4.1	Test Case 1 – Message Update Initiated by SU 1	*U*	*U*	*U*
2.5.3.4.3	Test Case 3 – SU 1 to Group Message Update	*U*	*U*	*U*
2.5.4	**Status Update**			
2.5.4.4.1	Test Case 1 – Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.4.4.3	Test Case 3 – SU to Talk Group Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.5	**Status Query**			
2.5.5.4.1	Test Case 1 – Status Query Initiated by SU 1	*U*	*U*	*U*
2.5.6	**Radio Unit Monitor**			
2.5.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.5.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.3 - Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-DMC-(
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - FNE Dispatch Monitoring Console - Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.6.1	**Unaddressed Voice Call**			
2.6.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.6.2	**Routine Group Call**			
2.6.2.4.1	Test Case 1 – Routine Group Call	*P*	*P*	*P*
2.6.3	**Emergency Call**			
2.6.3.4.1	Test Case 1 – Emergency Call from SU	*P*	*P*	*P*
2.6.3.4.2	Test Case 2 – Emergency Call from DMC	*U4*	*U4*	*P*
2.6.4	**All Call (System-Wide Call)**			
2.6.4.4.1	Initiate System-Wide Call to Collection of Talk Groups	*P*	*P*	*U4*
2.6.5	**Unit-to-Unit Voice Call**			
2.6.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from DMC	*P*	*P*	*P*
2.6.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.6.6	**Encryption**			
2.6.6.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.7.1	**Emergency Alarm to Dispatch and/or other Monitoring Console**			
2.7.1.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*
2.7.2	**Call Alert**			
2.7.2.4.1	Test Case 1 – Initiate Call Alert Request from DMC	*P*	*P*	*U4*
2.7.2.4.2	Test Case 2 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.7.3	**Radio Check**			
2.7.3.4.1	Test Case 1 – Initiate Radio Check from DMC	*P*	*U4*	*U4*
2.7.4	**Radio Unit Inhibit**			
2.7.4.4.1	Test Case 1 – Radio Unit Inhibit from DMC	*P*	*U4*	*U4*
2.7.5	**Radio Unit Uninhibit**			
2.7.5.4.1	Test Case 1 – Radio Unit Uninhibit from DMC	*P*	*U4*	*U4*
2.7.6	**Message Update**			
2.7.6.4.1	Test Case 1 – Message Update from DMC	*U*	*U4*	*U4*
2.7.6.4.2	Test Case 2 – DMC to Group Message Update	*U*	*U*	*U4*
2.7.6.4.3	Test Case 3 – SU 1 to DMC Message Update	*U*	*U*	*U*
2.7.6.4.4	Test Case 4 – SU 1 to Group Message Update	*P*	*U*	*U4*
2.7.7	**Status Update**			
2.7.7.4.1	Test Case 1 – Status Update from SU 1 to DMC	*U*	*U*	*U*
2.7.7.4.2	Test Case 2 – Talk Group Status Update Initiated by SU 1	*P*	*U*	*U4*
2.7.8	**Status Query**			
2.7.8.4.1	Test Case 1 – Status Query Initiated by DMC	*P*	*U*	*U4*
2.7.9	**Radio Unit Monitor**			
2.7.9.4.1	Test Case 1 – Radio Unit Monitor Initiated by DMC – Group Call	*P*	*U*	*U4*
2.7.9.4.2	Test Case 2 – Radio Unit Monitor Initiated by DMC – Unit-to-Unit Call	*U*	*U*	*U4*

Trunked Subscriber Unit Interoperability - FDMA (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.4 - Trunked Subscriber Unit Interoperability – FDMA (Phase 1)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - FDMA			
Base Station Repeater Vendor	**Model Name**	**Product No.**	**Detailed Test Report #**
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-FDMA
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-09111601; DTR-P
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M; DTR-

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - FDMA (2016&2017 CAB)

***Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.2	Test Case 2 – Denied or Refused Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.3	Test Case 3 – Unverified Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.2	Test Case 2 – Group Call Denied	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.4	*** Test Case 4 – Group Call Interrupt ***	*P*	*P*	*P*				*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.2	Test Case 2 - Unit-to-Unit Call with Target Availability Check- Denied by Target	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.7	Test Case 7 – Unit-to-Unit Call Denied	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5	**Affiliation**									
2.2.5.4.1	Test Case 1 – Radio Permitted to Affiliate with New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5.4.2	Test Case 2 – Radio Denied Affiliation to New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.7	**Emergency Alarm**									
2.2.7.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.11	**Intra-Location Registration Area Roaming**									
2.2.11.4.1	Test Case 1 – Idle Radio	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.13	**Deregistration *** **									
2.2.13.4.1	Test Case 1 – Deregistration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call *** **									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*
2.2.15	**Call Alert *** **									
2.2.15.4.1	Test Case 1 – Call Alert	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.16	**Short Message *** **									
2.2.16.4.1	Test Case 1 – Short Message	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.17	**Status Query *** **									
2.2.17.4.1	Test Case 1 – Status Query	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.18	**Status Update *** **									
2.2.18.4.1	Test Case 1 – Status Update	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.19	**Radio Unit Monitoring *** **									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.20	**Radio Unit Disable/Re-Enable *** **									
2.2.20.4.1	Test Case 1 – Radio Unit Disable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.20.4.2	Test Case 2 – Radio Unit Re-Enable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.21	**Radio Check *** **									
2.2.21.4.1	Test Case 1 – Radio Check Successful	*P*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*

*** Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Trunked Subscriber Unit Interoperability - TDMA (2017 CAB)	(leave test section empty for 2016 CAB)
CAB Test Section Identification	
P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.5 - Trunked Subscriber Unit Interoperability – TDMA (Phase 2)	

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - TDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-TDMA
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18111101
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number inTIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - TDMA (2017 CAB)

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.4	Test Case 4 – Group Call Interrupt	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call**									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19	**Radio Unit Monitoring**									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26	**Transmitting Subscriber Forced Preemption**									
2.2.26.4.1	Test Case 1 – TDMA SU Forced Audio Preemption	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26.4.2	Test Case 2 – TDMA SU Forced Emergency Call Ruthless Preemption	*P*	*P*	*P*	*U4*	*U4*	*U4*	*P*	*P*	*U4*

PRODUCT UNDER TEST

CAP Approval 20240823

Product Info	Details
Model_Name:	**APX N70**
Hardware Capability/Options:	700/800 MHz bandsplit (762-776, 792-806, 806-825, 851-870 MHz) UHF-R1 (380-470MHz); UHF-R2 (450-520MHz)
Software Options:	P25 Conventional, P25 Trunked, P25 TDMA Trunked, AES-256 Encryption

TEST CASE RESULT NOTATIONS AND DEFINITIONS (Vendors may define additional notations/definitions)

Notation	Test Case Result Definition
P (Pass)	Test was passed and met stated requirements where listed
P1	Functionality requires product with DTMF keypad
P2	Functionality requires product with display capable of ID display
P3	Functionality requires DTMF microphone
P4	Functionality requires AES 256 encryption
P5	Interoperability verified with only one representative base station repeater
P	Interoperability verified with only two representative base station repeaters
P7	Test was passed based on TIA-102.CABA-A (test cases 2.2.8.4.1 and 2.4.14.4.1) which allows a subscriber to always unmute with $F7E NAC.
U (Unsupported)	Test examines functionality the Product Under Test does not support
U1	37.5 millisecond slot times is not supported
U2	45 millisecond slot times is not supported
U3	Functionality is not supported by subscriber unit
U4	Functionality is not supported by the representative base station repeater tested with the subscriber under test
U5	Functionality is not supported by the representative subscriber unit tested with the subscriber under test
E (Exception)	DHS OIC Approved Test Case Exception
E1	In accordance with the guidance given in TIA 102.CAAB-D §3.2.18, if the transmitter carrier output power rating is 6 watts or less, the mean frequency difference during t1 and t3, may be greater than ±12.5 kHz.
F (Fail)	Test was failed and did not meet stated requirements where listed

Conventional Subscriber Performance (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.1 – Conventional Subscriber Unit Performance
Detailed Test Report Identification
[DTR-P25CAP-3772], (DTR-P25CAP-3851), (DTR-P25CAP-3871)

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Conventional Subscriber Unit Receiver Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*N/A*	*P*	*P*	*P*	*P*
3.1.17	Late Entry Unsquelch Delay: No Talk Group or Encryption	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*
3.1.18	Receiver Throughput Delay	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*

Conventional Subscriber Unit Transmitter Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Transmitter Attack Time	≤ 50 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*N/A*	*P*	*P*	*P*	*P*
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	|Δf| ≤ 12.5 kHz	N/A	[t1=10ms] *P*	[t1=10ms] *P*	[t1=20ms] *P*	[t1=20ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	N/A	[t2=25ms] *P*	[t2=25ms] *P*	[t2=50ms] *P*	[t2=50ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	N/A	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Performance - FDMA (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.2 – Trunked Subscriber Unit Performance - FDMA
Detailed Test Report Identification
[DTR-P25CAP-3772], (DTR-P25CAP-3851), (DTR-P25CAP-3871)

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Trunked Subscriber Unit Receiver Tests - FDMA (2018 CAB)

Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*N/A*	*P*	*P*	*P*	*P*

Trunked Subscriber Unit Transmitter Tests - FDMA (2018 CAB)

Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Power Attack Time	≤ 50 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*N/A*	*P*	*P*	*P*	*P*
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	$\lvert\Delta f\rvert \leq 12.5$ kHz	N/A	[t1=10ms] *P*	[t1=10ms] *P*	[t1=20ms] *P*	[t1=20ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	$\lvert\Delta f\rvert \leq 6.25$ kHz	N/A	[t2=25ms] *P*	[t2=25ms] *P*	[t2=50ms] *P*	[t2=50ms] *P*
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	$\lvert\Delta f\rvert \leq 12.5$ kHz	N/A	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*	[t3=10ms] *P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Unit Trunked Tests - FDMA (2018 CAB)

Test Case	Test Case Description	Requirement	Result
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 4.15$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 4.15$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Turn Off Time	≤ 1.57 ms	*P*
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 11.65$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 11.65$ ms	*P*
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Turn Off Time	≤ 1.57 ms	*P*
3.3.2	Trunked Request Time - 37.5 ms Slot	≤ 160 ms	*P*
3.3.2	Trunked Request Time - 45 ms Slot	≤ 167.5 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form RF Transmitter time to Key on a Working Channel	≤ 150.0 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form Encoder Transmit Time	≤ 150.0 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form RF Transmitter Time to Key on a Working Channel	≤ 171.1 ms	*P*
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form Encoder Transmit Time	≤ 171.1 ms	*P*

Trunked Subscriber Performance - TDMA (2018 CAB)
Test Identification
P25-CAB-CAI_TEST_REQ –Oct9ber 2018, Section 2.1.1.3 - Trunked Subscriber Unit Performance - TDMA
Detailed Test Report Identification
[DTR-P25CAP-3772], (DTR-P25CAP-3851), (DTR-P25CAP-3871)

(leave test section empty for 2016 CAB)

The 'test case' number refers to the paragraph number for the test procedure found in TIA-102.CCAA-B Two-Slot Time Division Multiple Access Transceiver Measurement Methods for TDMA.

Trunked Subscriber Unit Receiver Tests - TDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.1.4	Reference Sensitivity - HDQPSK	≤ -116 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity - HDQPSK	≤ -108 dBm	*N/A*	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability - HDQPSK	≥ 65 µs	*N/A*	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection - HDQPSK	≥ 60 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection - HDQPSK	≥ 47 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*N/A*	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*N/A*	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*N/A*	*P*	*P*	*P*	*P*

Trunked Subscriber Unit Transmitter Tests - TDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	700 Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 65 dB (non-700MHz)	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Frequency Deviation H-CPM – High level Signal	$2995 < f_{dev} \leq 3310$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.12	Frequency Deviation H-CPM – Low Level Signal	$998 < f_{dev} \leq 1104$ Hz	*N/A*	*P*	*P*	*P*	*P*
3.2.13	Modulation Fidelity	≤ 5%	*N/A*	*P*	*P*	*P*	*P*
3.2.14	Symbol Rate Accuracy	Not to exceed 10 parts per million	*N/A*	*P*	*P*	*P*	*P*
3.2.15	H-CPM Transmitter Logical Channel Peak Adjacent Channel Power Ratio	≥ 35 dB	*N/A*	*P*	*P*	*P*	*P*
3.2.16	H-CPM Transmitter Logical Channel Off Slot Power	≤ -57dBm	*N/A*	*P*	*P*	*P*	*P*
3.2.17	H-CPM Transmitter Logical Channel Power Envelop						
3.2.17	Max - On	4 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.17	Slot Max	1 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.17	Slot Min	-3 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.17	Max - Off	4 dBc	*N/A*	*P*	*P*	*P*	*P*
3.2.18	H-CPM Transmitter Logical Channel Time Alignment	±25 microseconds or less	*N/A*	*P*	*P*	*P*	*P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Conventional Subscriber Unit Interoperability - Direct Mode (2018 CAB)

Test Identification

P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.3.1 - Conventional Subscriber Unit Interoperability – Direct Mode

Representative Conventional Subscriber Unit Products tested with the Subscriber Unit for Conventional Interoperability - Direct Mode

Subscriber Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	APX8000	1	DTR-P25CAP081011-P1850004-DMO-
EF Johnson Technologies	Viking VP900	2	DTR-P25CAP081010-18052403
Harris Corporation	XL-200P	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - Direct Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.2.1**	**Matching NAC Operation and SU Unaddressed Voice Call****			
2.2.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.2.2**	**Matching NAC Operation and SU Routine Group Voice Call****			
2.2.2.4.1	Test Case 1 – Routine Group Voice Call	*P*	*P*	*P*
2.2.3**	**Monitor Mode – SU Group Voice Call****			
2.2.3.4.1	Test Case 1 – Receiving Group Call	*P*	*P*	*P*
2.2.8**	**Accept Any NAC in Normal & Selective Squelch Mode – SU Group Voice Call****			
2.2.8.4.1	Test Case 1 – Receiving Group Call with Receive NAC $F7E under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.2.4	**Emergency Call**			
2.2.4.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.2.5	**Unit-to-Unit Voice Call**			
2.2.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.6	**Unit-to-Unit Voice Call – Receiving Units also in Monitor Mode**			
2.2.6.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.6.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.7	**Encryption**			
2.2.7.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.3.1	**Call Alert**			
2.3.1.4.1	Test Case 1 – Call Alert (SU 1 to SU 5)	*P*	*P*	*U5*
2.3.1.4.2	Test Case 2 – Call Alert (SU 5 to SU 1)	*P*	*P*	*U5*
2.3.2	**Radio Check**			
2.3.2.4.1	Test Case 1 – Radio Check (SU 1 to SU 5)	*U*	*U*	*U*
2.3.2.4.2	Test Case 2 – Radio Check (SU 5 to SU 1)	*U*	*U*	*U*
2.3.3	**Message Update**			
2.3.3.4.1	Test Case 1 – Message Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.3.4.2	Test Case 2 – Message Update (SU 5 to SU 1)	*U*	*U*	*U*

2.3.4	**Status Update**			
2.3.4.4.1	Test Case 1 – Status Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.4.4.2	Test Case 2 – Status Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.5	**Status Query**			
2.3.5.4.1	Test Case 1 – Status Query (SU 1 to SU 5)	*U*	*U*	*U*
2.3.5.4.2	Test Case 2 – Status Query (SU 5 to SU 1)	*U*	*U*	*U*
2.3.6	**Radio Unit Monitor**			
2.3.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.3.6.4.2	Test Case 2 – Radio Unit Monitor Initiated by SU 5 – Group Call	*U*	*U*	*U*
2.3.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*
2.3.6.4.4	Test Case 4 – Radio Unit Monitor Initiated by SU 5 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.2 - Conventional Subscriber Unit Interoperability – Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-RMO-
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests- Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.4.1**	**Matching NAC Operation and SU Unaddressed Voice Call ****			
2.4.1.4.1	Test Case 1 – Matching NAC operation – Unaddressed Voice Call	*P*	*P*	*P*
2.4.2**	**Matching NAC Operation – SU Routine Group Call Mode ****			
2.4.2.4.1	Test Case 1 – Matching NAC – SU Routine Group Call Mode	*P*	*P*	*P*
2.4.3	**Transmit NAC Independent of Receive NAC – SU Unaddressed Voice Call**			
2.4.3.4.1	Test Case 1 – Independent NAC Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.4	**Transmit NAC Independent of Receive NAC – SU Routine Group Call**			
2.4.4.4.1	Test Case 1 – Independent NAC Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.5	**Any NAC ($F7F) Operation – SU Unaddressed Voice Call**			
2.4.5.4.1	Test Case 1 – NAC $F7F Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.6	**Any NAC ($F7F) Operation – SU Routine Group Call**			
2.4.6.4.1	Test Case 1 – NAC $F7F Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.7	**Any NAC ($F7E) Operation with Fixed Transmit NAC – SU Group Call**			
2.4.7.4.1	Test Case 1 – NAC $F7E Operation – SU Group Call	*P*	*P*	*P*
2.4.8	**Emergency Call**			
2.4.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.4.9**	**Monitor Mode – SU Group Call ****			
2.4.9.4.1	Test Case 1 – Monitor Mode – Receiving Group Call	*P*	*P*	*P*
2.4.10	**Unit-to-Unit Voice Call**			
2.4.10.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.10.4.3	Test Case 3 – Initiate Unit-to-Unit Call from SU 1, No Co-Channel Interference Suppression	*P*	*P*	*P*
2.4.11	**Unit-to-Unit Voice Call Co-Channel Interference Suppression by FNE**			
2.4.11.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.12	**Unit-to-Unit Voice Call – Receiving Units Also in Monitor Mode**			
2.4.12.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.13	**Encryption**			
2.4.13.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.4.14	**Accept Any NAC in Normal and Selective Squelch Mode – SU Group Call**			
2.4.14.4.1	Test Case 1 – Receiving group Call with receive NAC $F7F under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.5.1	**Call Alert**			
2.5.1.4.1	Test Case 1 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.5.2	**Radio Check**			
2.5.2.4.1	Test Case 1 – Initiate Radio Check from SU 1	*U*	*U*	*U*
2.5.3	**Message Update**			
2.5.3.4.1	Test Case 1 – Message Update Initiated by SU 1	*U*	*U*	*U*
2.5.3.4.3	Test Case 3 – SU 1 to Group Message Update	*U*	*U*	*U*
2.5.4	**Status Update**			
2.5.4.4.1	Test Case 1 – Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.4.4.3	Test Case 3 – SU to Talk Group Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.5	**Status Query**			
2.5.5.4.1	Test Case 1 – Status Query Initiated by SU 1	*U*	*U*	*U*
2.5.6	**Radio Unit Monitor**			
2.5.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.5.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.3 - Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-DMC-
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - FNE Dispatch Monitoring Console - Repeat Mode (2016&2017 CAB)

Test Case	Description	Product 1 Result	Product 2 Result	Product 3 Result
2.6.1	**Unaddressed Voice Call**			
2.6.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.6.2	**Routine Group Call**			
2.6.2.4.1	Test Case 1 – Routine Group Call	*P*	*P*	*P*
2.6.3	**Emergency Call**			
2.6.3.4.1	Test Case 1 – Emergency Call from SU	*P*	*P*	*P*
2.6.3.4.2	Test Case 2 – Emergency Call from DMC	*U4*	*U4*	*P*
2.6.4	**All Call (System-Wide Call)**			
2.6.4.4.1	Initiate System-Wide Call to Collection of Talk Groups	*P*	*P*	*U4*
2.6.5	**Unit-to-Unit Voice Call**			
2.6.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from DMC	*P*	*P*	*P*
2.6.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.6.6	**Encryption**			
2.6.6.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.7.1	**Emergency Alarm to Dispatch and/or other Monitoring Console**			
2.7.1.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*
2.7.2	**Call Alert**			
2.7.2.4.1	Test Case 1 – Initiate Call Alert Request from DMC	*P*	*P*	*U4*
2.7.2.4.2	Test Case 2 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.7.3	**Radio Check**			
2.7.3.4.1	Test Case 1 – Initiate Radio Check from DMC	*P*	*U4*	*U4*
2.7.4	**Radio Unit Inhibit**			
2.7.4.4.1	Test Case 1 – Radio Unit Inhibit from DMC	*P*	*U4*	*U4*
2.7.5	**Radio Unit Uninhibit**			
2.7.5.4.1	Test Case 1 – Radio Unit Uninhibit from DMC	*P*	*U4*	*U4*
2.7.6	**Message Update**			
2.7.6.4.1	Test Case 1 – Message Update from DMC	*U*	*U4*	*U4*
2.7.6.4.2	Test Case 2 – DMC to Group Message Update	*U*	*U*	*U4*
2.7.6.4.3	Test Case 3 – SU 1 to DMC Message Update	*U*	*U*	*U*
2.7.6.4.4	Test Case 4 – SU 1 to Group Message Update	*P*	*U*	*U4*
2.7.7	**Status Update**			
2.7.7.4.1	Test Case 1 – Status Update from SU 1 to DMC	*U*	*U*	*U*
2.7.7.4.2	Test Case 2 – Talk Group Status Update Initiated by SU 1	*P*	*U*	*U4*
2.7.8	**Status Query**			
2.7.8.4.1	Test Case 1 – Status Query Initiated by DMC	*P*	*U*	*U4*
2.7.9	**Radio Unit Monitor**			
2.7.9.4.1	Test Case 1 – Radio Unit Monitor Initiated by DMC – Group Call	*P*	*U*	*U4*
2.7.9.4.2	Test Case 2 – Radio Unit Monitor Initiated by DMC – Unit-to-Unit Call	*U*	*U*	*U4*

Trunked Subscriber Unit Interoperability - FDMA (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.4 - Trunked Subscriber Unit Interoperability – FDMA (Phase 1)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - FDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-FDMA
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-09111601; DTR-
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M; DTR-

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - FDMA (2016&2017 CAB)

***Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.2	Test Case 2 – Denied or Refused Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.1.4.3	Test Case 3 – Unverified Registration	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.2	Test Case 2 – Group Call Denied	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.2.4.4	*** Test Case 4 – Group Call Interrupt ***	*P*	*P*	*P*				*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									

2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.2	Test Case 2 - Unit-to-Unit Call with Target Availability Check- Denied by Target	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.7	Test Case 7 – Unit-to-Unit Call Denied	*P*	*U4*	*U4*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5	**Affiliation**									
2.2.5.4.1	Test Case 1 – Radio Permitted to Affiliate with New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.5.4.2	Test Case 2 – Radio Denied Affiliation to New Group	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.7	**Emergency Alarm**									
2.2.7.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.11	**Intra-Location Registration Area Roaming**									
2.2.11.4.1	Test Case 1 – Idle Radio	*P*	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*
2.2.13	**Deregistration *****									
2.2.13.4.1	Test Case 1 – Deregistration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call *****									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*
2.2.15	**Call Alert *****									
2.2.15.4.1	Test Case 1 – Call Alert	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.16	**Short Message *****									
2.2.16.4.1	Test Case 1 – Short Message	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.17	**Status Query *****									
2.2.17.4.1	Test Case 1 – Status Query	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.18	**Status Update *****									
2.2.18.4.1	Test Case 1 – Status Update	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.19	**Radio Unit Monitoring *****									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.20	**Radio Unit Disable/Re-Enable *****									
2.2.20.4.1	Test Case 1 – Radio Unit Disable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.20.4.2	Test Case 2 – Radio Unit Re-Enable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.21	**Radio Check *****									
2.2.21.4.1	Test Case 1 – Radio Check Successful	*P*	*U4*	*U4*	*P*	*P*	*P*	*U4*	*U4*	*U4*

*** Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Trunked Subscriber Unit Interoperability - TDMA (2017 CAB)

(leave test section empty for 2016 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.5 - Trunked Subscriber Unit Interoperability – TDMA (Phase 2)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - TDMA

Base Station Repeater Vendor	Model Name	Product No.	Detailed Test Report #
Motorola Solutions	GTR 8000	1	DTR-P25CAP081011-P1850004-TDMA
EF Johnson Technologies	4500 Repeater	2	DTR-P25CAP081010-18111101
Harris Corporation	MASTR V	3	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number inTIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - TDMA (2017 CAB)

Test Case	Description	Product 1 Result Home	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	Product 2 Result Home	Product 2 Result Inter-SYS Roaming	Product 2 Result Inter-WACN Roaming	Product 3 Result Home	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**									
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**									
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.4	Test Case 4 – Group Call Interrupt	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**									
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.4	**Broadcast Voice Call**									
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**									
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**									

2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.10	**Encryption**									
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call**									
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19	**Radio Unit Monitoring**									
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26	**Transmitting Subscriber Forced Preemption**									
2.2.26.4.1	Test Case 1 – TDMA SU Forced Audio Preemption	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26.4.2	Test Case 2 – TDMA SU Forced Emergency Call Ruthless Preemption	*P*	*P*	*P*	*U4*	*U4*	*U4*	*P*	*P*	*U4*

PRODUCT UNDER TEST

CAP Approval 20240823

Product Info	Details
Model_Name:	**APX NEXT, APX NEXT XE, APX NEXTi (International), APX NEXT XN**
Hardware Capability/Options:	Full Touch Display; Full Touch Display Keypad; VHF (136-174MHz); UHF-R1 (380-470MHz); UHF-R2 (450-520MHz); 700MHz (762-776, 792-806 MHz); 800MHz (806-825, 851-870 MHz)
Software Options:	P25 Conventional, P25 Trunked, P25 TDMA Trunked, AES-256 Encryption

TEST CASE RESULT NOTATIONS AND DEFINITIONS (Vendors may define additional notations/definitions)

Notation	Test Case Result Definition
P (Pass)	Test was passed and met stated requirements where listed
P1	Functionality requires product with DTMF keypad
P2	Functionality requires product with display capable of ID display
P3	Functionality requires DTMF microphone
P4	Functionality requires AES 256 encryption
P5	Interoperability verified with only one representative base station repeater
P6	Interoperability verified with only two representative base station repeaters
P7	Test was passed based on TIA-102.CABA-A (test cases 2.2.8.4.1 and 2.4.14.4.1) which allows a subscriber to always unmute with $F7E NAC.
U (Unsupported)	Test examines functionality the Product Under Test does not support
U1	37.5 millisecond slot times is not supported
U2	45 millisecond slot times is not supported
U3	Functionality is not supported by subscriber unit
U4	Functionality is not supported by the representative base station repeater tested with the subscriber under test
U5	Functionality is not supported by the representative subscriber unit tested with the subscriber under test
E (Exception)	DHS OIC Approved Test Case Exception
E1	In accordance with the guidance given in TIA 102.CAAB-D §3.2.18, if the transmitter carrier output power rating is 6 watts or less, the mean frequency difference during t1 and t3, may be greater than ±12.5 kHz.
F (Fail)	Test was failed and did not meet stated requirements where listed

Conventional Subscriber Performance (2018 CAB)
P25 CAP Test Identification
P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.1 – Conventional Subscriber Unit Performance
Detailed Test Report Identification
[DTR-P25CAP-3590, DTR-P25CAP-3850 (VHF, UHF, 700-800MHz)]

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Conventional Subscriber Unit Receiver Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	*P*	*P*	*P*	*P*
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*P*	*P*	*P*	*P*
3.1.17	Late Entry Unsquelch Delay: No Talk Group or Encryption	≤ 125 ms	*P*	*P*	*P*	*P*
3.1.18	Receiver Throughput Delay	≤ 125 ms	*P*	*P*	*P*	*P*

Conventional Subscriber Unit Transmitter Tests (2018 CAB) — Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	*P*	*P*	*P*	*P*
3.2.12	Transmitter Attack Time	≤ 50 ms	*P*	*P*	*P*	*P*
3.2.12	Encoder Attack Time	≤ 100 ms	*P*	*P*	*P*	*P*
3.2.14	Transmitter Throughput Delay	≤ 125 ms	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	*P*	*P*	*P*	*P*
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	*P*	*P*	*P*	*P*
3.2.16	Modulation Fidelity – C4FM	≤ 5%	*P*	*P*	*P*	*P*

3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	|Δf| ≤ 12.5 kHz	[t1=5ms] P	[t1=10ms] P	[t1=10ms] P	[t1=20ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	[t2=20ms] P	[t2=25ms] P	[t2=25ms] P	[t2=50ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	[t3=5ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Performance - FDMA (2018 CAB)

P25 CAP Test Identification

P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.1.2 – Trunked Subscriber Unit Performance - FDMA

Detailed Test Report Identification

[DTR-P25CAP-3590, DTR-P25CAP-3850 (VHF, UHF, 700-800MHz)]

The 'test case' number refers to the paragraph number for the test procedure found in the TIA-102.CAAA-E Digital C4FM/CQPSK Transceiver Measurement Methods for FDMA .

Trunked Subscriber Unit Receiver Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	800 Result
3.1.4	Reference Sensitivity – C4FM	≤ -116 dBm	P	P	P	P
3.1.4	Reference Sensitivity – Standard Simulcast	≤ -116 dBm	P	P	P	P
3.1.5	Faded Reference Sensitivity – C4FM	≤ -108 dBm	P	P	P	P
3.1.5	Faded Reference Sensitivity – Standard Simulcast	≤ -108 dBm	P	P	P	P
3.1.6	Signal Delay Spread Capability – C4FM	≥ 50 µs	P	P	P	P
3.1.6	Signal Delay Spread Capability – Standard Simulcast	≥ 80 µs	P	P	P	P
3.1.7.1	Adjacent Channel Rejection – C4FM	≥ 60 dB	P	P	P	P
3.1.7.1	Adjacent Channel Rejection – Standard Simulcast	≥ 60 dB	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection – C4FM	≥ 47 dB	P	P	P	P
3.1.7.2	Offset Adjacent Channel Rejection – Standard Simulcast	≥ 47 dB	P	P	P	P
3.1.8	Co-Channel Rejection	≤ 9 dB	P	P	P	P
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	P	P	P	P
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	P	P	P	P
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P	P	P	P

Trunked Subscriber Unit Transmitter Tests - FDMA (2018 CAB) Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 67 dB (non-700MHz)	P	P	P	P
3.2.12	Power Attack Time	≤ 50 ms	P	P	P	P
3.2.12	Encoder Attack Time	≤ 100 ms	P	P	P	P
3.2.14	Transmitter Throughput Delay	≤ 125 ms	P	P	P	P
3.2.15	Frequency Deviation for C4FM: High-Level Signal Deviation	$2544 < f_{dev} \leq 3111$ Hz	P	P	P	P
3.2.15	Frequency Deviation for C4FM: Low-Level Signal Deviation	$848 < f_{dev} \leq 1037$ Hz	P	P	P	P
3.2.16	Modulation Fidelity – C4FM	≤ 5%	P	P	P	P
3.2.18	Transient Frequency Behavior: Time Interval [see t1 value in cell]	|Δf| ≤ 12.5 kHz	[t1=5ms] P	[t1=10ms] P	[t1=10ms] P	[t1=20ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t2 value in cell]	|Δf| ≤ 6.25 kHz	[t2=20ms] P	[t2=25ms] P	[t2=25ms] P	[t2=50ms] P
3.2.18	Transient Frequency Behavior: Time Interval [see t3 value in cell]	|Δf| ≤ 12.5 kHz	[t3=5ms] P	[t3=10ms] P	[t3=10ms] P	[t3=10ms] P

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Trunked Subscriber Unit Trunked Tests - FDMA (2018 CAB)

Test Case	Test Case Description	Requirement	Result
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 4.15$ ms	P
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 4.15$ ms	P
3.3.1	Trunked Control Channel Slot Times - 37.5 ms Slot RF Power Turn Off Time	≤ 1.57 ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot Encode Attack Time	$2.00 \leq t_{slot} \leq 11.65$ ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Attack Time	$0.00 \leq t_{slot} \leq 11.65$ ms	P
3.3.1	Trunked Control Channel Slot Times - 45 ms Slot RF Power Turn Off Time	≤ 1.57 ms	P
3.3.2	Trunked Request Time - 37.5 ms Slot	≤ 160 ms	P
3.3.2	Trunked Request Time - 45 ms Slot	≤ 167.5 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form RF Transmitter time to Key on a Working Channel	≤ 150.0 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form Encoder Transmit Time	≤ 150.0 ms	P
3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form RF Transmitter Time to Key on a Working Channel	≤ 171.1 ms	P

3.3.5	Transmitter Time to Key on a Traffic Channel Explicit Channel Form Encoder Transmit Time	≤ 171.1 ms	*P*

Trunked Subscriber Performance - TDMA (2018 CAB)

(leave test section empty for 2016 CAB)

Test Identification

P25-CAB-CAI_TEST_REQ –October 2018, Section 2.1.1.3 - Trunked Subscriber Unit Performance - TDMA

Detailed Test Report Identification

[DTR-P25CAP-3590, DTR-P25CAP-3850 (VHF, UHF, 700-800MHz)]

The 'test case' number refers to the paragraph number for the test procedure found in TIA-102.CCAA-B Two-Slot Time Division Multiple Access Transceiver Measurement Methods for TDMA.

Trunked Subscriber Unit Receiver Tests - TDMA (2018 CAB)

Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	800 Result
3.1.4	Reference Sensitivity - HDQPSK	≤ -116 dBm	*P*	*P*	*P*	*P*
3.1.5	Faded Reference Sensitivity - HDQPSK	≤ -108 dBm	*P*	*P*	*P*	*P*
3.1.6	Signal Delay Spread Capability - HDQPSK	≥ 65 µs	*P*	*P*	*P*	*P*
3.1.7.1	Adjacent Channel Rejection - HDQPSK	≥ 60 dB	*P*	*P*	*P*	*P*
3.1.7.2	Offset Adjacent Channel Rejection - HDQPSK	≥ 47 dB	*P*	*P*	*P*	*P*
3.1.8	Co-Channel Rejection	≤ 9 dB	*P*	*P*	*P*	*P*
3.1.9	Spurious Response Rejection	≥ 80 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*
3.1.10	Intermodulation Rejection	≥ 75 dB Mobile ≥ 70 dB Portable	*P*	*P*	*P*	*P*
3.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	*P*	*P*	*P*	*P*

Trunked Subscriber Unit Transmitter Tests - TDMA (2018 CAB)

Only display results for tested frequency band(s)

Test Case	Test Case Description	Requirement	VHF Result	UHF-L Result	UHF-H Result	800 Result
3.2.8	Unwanted Emissions: Adjacent Channel Power Ratio*	≥ 65 dB (non-700MHz)	*P*	*P*	*P*	*P*
3.2.12	Frequency Deviation H-CPM – High level Signal	$2995 < f_{dev} \leq 3310$ Hz	*P*	*P*	*P*	*P*
3.2.12	Frequency Deviation H-CPM – Low Level Signal	$998 < f_{dev} \leq 1104$ Hz	*P*	*P*	*P*	*P*
3.2.13	Modulation Fidelity	≤ 5%	*P*	*P*	*P*	*P*
3.2.14	Symbol Rate Accuracy	Not to exceed 10 parts per million	*P*	*P*	*P*	*P*
3.2.15	H-CPM Transmitter Logical Channel Peak Adjacent Channel Power Ratio	≥ 35 dB	*P*	*P*	*P*	*P*
3.2.16	H-CPM Transmitter Logical Channel Off Slot Power	≤ -57dBm	*P*	*P*	*P*	*P*
3.2.17	H-CPM Transmitter Logical Channel Power Envelop					
3.2.17	Max - On	4 dBc	*P*	*P*	*P*	*P*
3.2.17	Slot Max	1 dBc	*P*	*P*	*P*	*P*
3.2.17	Slot Min	-3 dBc	*P*	*P*	*P*	*P*
3.2.17	Max - Off	4 dBc	*P*	*P*	*P*	*P*
3.2.18	H-CPM Transmitter Logical Channel Time Alignment	±25 microseconds or less	*P*	*P*	*P*	*P*

*700MHz Adjacent Channel Power Ratio test is passed based on test results submitted for FCC equipment authorization.

Conventional Subscriber Unit Interoperability - Direct Mode (2018 CAB)

Test Identification

P25-CAB-CAI_TEST_REQ – October 2018, Section 2.1.3.1 - Conventional Subscriber Unit Interoperability – Direct Mode

Representative Conventional Subscriber Unit Products tested with the Subscriber Unit for Conventional Interoperability - Direct Mode

Subscriber Vendor	Model Name	Abbrev.	Detailed Test Report #
Motorola Solutions	APX8000	MSI APX8000	DTR-P25CAP081011-P1850004-DMO-APX8K
EF Johnson Technologies	Viking VP900	EFJ VP900	DTR-P25CAP081010-18052403
L3Harris Corporation	XL-200P	L3Harris	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - Direct Mode (2016&2017 CAB)

Test Case	Description	MSI APX8000	EFJ VP900	L3Harris XL-200P
2.2.1**	**Matching NAC Operation and SU Unaddressed Voice Call****			
2.2.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.2.2**	**Matching NAC Operation and SU Routine Group Voice Call****			
2.2.2.4.1	Test Case 1 – Routine Group Voice Call	*P*	*P*	*P*
2.2.3**	**Monitor Mode – SU Group Voice Call****			
2.2.3.4.1	Test Case 1 – Receiving Group Call	*P*	*P*	*P*

2.2.8**	**Accept Any NAC in Normal & Selective Squelch Mode – SU Group Voice Call****			
2.2.8.4.1	Test Case 1 – Receiving Group Call with Receive NAC $F7E under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.2.4	**Emergency Call**			
2.2.4.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.2.5	**Unit-to-Unit Voice Call**			
2.2.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.6	**Unit-to-Unit Voice Call – Receiving Units also in Monitor Mode**			
2.2.6.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.2.6.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 5	*P*	*P*	*P*
2.2.7	**Encryption**			
2.2.7.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.3.1	**Call Alert**			
2.3.1.4.1	Test Case 1 – Call Alert (SU 1 to SU 5)	*P*	*P*	*U5*
2.3.1.4.2	Test Case 2 – Call Alert (SU 5 to SU 1)	*P*	*P*	*U5*
2.3.2	**Radio Check**			
2.3.2.4.1	Test Case 1 – Radio Check (SU 1 to SU 5)	*U*	*U*	*U*
2.3.2.4.2	Test Case 2 – Radio Check (SU 5 to SU 1)	*U*	*U*	*U*
2.3.3	**Message Update**			
2.3.3.4.1	Test Case 1 – Message Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.3.4.2	Test Case 2 – Message Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.4	**Status Update**			
2.3.4.4.1	Test Case 1 – Status Update (SU 1 to SU 5)	*U*	*U*	*U*
2.3.4.4.2	Test Case 2 – Status Update (SU 5 to SU 1)	*U*	*U*	*U*
2.3.5	**Status Query**			
2.3.5.4.1	Test Case 1 – Status Query (SU 1 to SU 5)	*U*	*U*	*U*
2.3.5.4.2	Test Case 2 – Status Query (SU 5 to SU 1)	*U*	*U*	*U*
2.3.6	**Radio Unit Monitor**			
2.3.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.3.6.4.2	Test Case 2 – Radio Unit Monitor Initiated by SU 5 – Group Call	*U*	*U*	*U*
2.3.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*
2.3.6.4.4	Test Case 4 – Radio Unit Monitor Initiated by SU 5 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - Repeat Mode (2017 CAB)
CAB Test Section Identification
P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.2 - Conventional Subscriber Unit Interoperability – Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - Repeat Mode

Base Station Repeater Vendor	Model Name	Abbrev.	Detailed Test Report #
Motorola Solutions	GTR 8000	MSI GTR 8000	DTR-P25CAP081011-P1850004-RMO-GTR8K
EF Johnson Technologies	4500 Repeater	EFJ 4500	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	L3Harris MASTR V	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests- Repeat Mode (2016&2017 CAB)

Test Case	Description	MSI GTR 8000	EFJ 4500	L3Harris MASTR V
2.4.1**	**Matching NAC Operation and SU Unaddressed Voice Call ****			
2.4.1.4.1	Test Case 1 – Matching NAC operation – Unaddressed Voice Call	*P*	*P*	*P*
2.4.2**	**Matching NAC Operation – SU Routine Group Call Mode ****			
2.4.2.4.1	Test Case 1 – Matching NAC – SU Routine Group Call Mode	*P*	*P*	*P*
2.4.3	**Transmit NAC Independent of Receive NAC – SU Unaddressed Voice Call**			
2.4.3.4.1	Test Case 1 – Independent NAC Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.4	**Transmit NAC Independent of Receive NAC – SU Routine Group Call**			
2.4.4.4.1	Test Case 1 – Independent NAC Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.5	**Any NAC ($F7F) Operation – SU Unaddressed Voice Call**			
2.4.5.4.1	Test Case 1 – NAC $F7F Operation – SU Unaddressed Voice Call	*P*	*P*	*P*
2.4.6	**Any NAC ($F7F) Operation – SU Routine Group Call**			
2.4.6.4.1	Test Case 1 – NAC $F7F Operation – SU Routine Group Call	*P*	*P*	*P*
2.4.7	**Any NAC ($F7E) Operation with Fixed Transmit NAC – SU Group Call**			
2.4.7.4.1	Test Case 1 – NAC $F7E Operation – SU Group Call	*P*	*P*	*P*
2.4.8	**Emergency Call**			
2.4.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*
2.4.9**	**Monitor Mode – SU Group Call ****			
2.4.9.4.1	Test Case 1 – Monitor Mode – Receiving Group Call	*P*	*P*	*P*
2.4.10	**Unit-to-Unit Voice Call**			
2.4.10.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.10.4.3	Test Case 3 – Initiate Unit-to-Unit Call from SU 1, No Co-Channel Interference Suppression	*P*	*P*	*P*

2.4.11	**Unit-to-Unit Voice Call Co-Channel Interference Suppression by FNE**			
2.4.11.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.12	**Unit-to-Unit Voice Call – Receiving Units Also in Monitor Mode**			
2.4.12.4.1	Test Case 1 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.4.13	**Encryption**			
2.4.13.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.4.14	**Accept Any NAC in Normal and Selective Squelch Mode – SU Group Call**			
2.4.14.4.1	Test Case 1 – Receiving group Call with receive NAC $F7F under Normal and Selective Squelch Modes	*P7*	*P7*	*P7*
2.5.1	**Call Alert**			
2.5.1.4.1	Test Case 1 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.5.2	**Radio Check**			
2.5.2.4.1	Test Case 1 – Initiate Radio Check from SU 1	*U*	*U*	*U*
2.5.3	**Message Update**			
2.5.3.4.1	Test Case 1 – Message Update Initiated by SU 1	*U*	*U*	*U*
2.5.3.4.3	Test Case 3 – SU 1 to Group Message Update	*U*	*U*	*U*
2.5.4	**Status Update**			
2.5.4.4.1	Test Case 1 – Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.4.4.3	Test Case 3 – SU to Talk Group Status Update Initiated by SU 1	*U*	*U*	*U*
2.5.5	**Status Query**			
2.5.5.4.1	Test Case 1 – Status Query Initiated by SU 1	*U*	*U*	*U*
2.5.6	**Radio Unit Monitor**			
2.5.6.4.1	Test Case 1 – Radio Unit Monitor Initiated by SU 1 – Group Call	*U*	*U*	*U*
2.5.6.4.3	Test Case 3 – Radio Unit Monitor Initiated by SU 1 – Unit-to-Unit Call	*U*	*U*	*U*

**** P25 CAP Minimum Feature Requirement - Test Case Result must be a Pass (P)**

For further information: https://www.dhs.gov/sites/default/files/publications/P25-CAB-MIN-FEATURE_REQ_171113-508.pdf

Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.3 - Conventional Subscriber Unit Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Representative Conventional Base Station Repeater Products tested with the Subscriber Unit for Conventional Interoperability - FNE Dispatch Monitoring Console - Repeat Mode

Base Station Repeater Vendor	Model Name	Abbrev	Detailed Test Report #
Motorola Solutions	GTR 8000	MSI GTR 8000	DTR-P25CAP081011-P1850004-DMC-GTR8K
EF Johnson Technologies	4500 Repeater	EFJ 4500	DTR-P25CAP081010-18052402
Harris Corporation	MASTR V	L3Harris MASTR V	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABA Interoperability Testing for Voice Operation in Conventional Systems.

Conventional Subscriber Unit Interoperability Tests - FNE Dispatch Monitoring Console - Repeat Mode (2016&2017 CAB)

Test Case	Description	MSI GTR 8000	EFJ 4500	L3Harris MASTR V
2.6.1	**Unaddressed Voice Call**			
2.6.1.4.1	Test Case 1 – Unaddressed Voice Call	*P*	*P*	*P*
2.6.2	**Routine Group Call**			
2.6.2.4.1	Test Case 1 – Routine Group Call	*P*	*P*	*P*
2.6.3	**Emergency Call**			
2.6.3.4.1	Test Case 1 – Emergency Call from SU	*P*	*P*	*P*
2.6.3.4.2	Test Case 2 – Emergency Call from DMC	*U4*	*U4*	*P*
2.6.4	**All Call (System-Wide Call)**			
2.6.4.4.1	Initiate System-Wide Call to Collection of Talk Groups	*P*	*P*	*U4*
2.6.5	**Unit-to-Unit Voice Call**			
2.6.5.4.1	Test Case 1 – Initiate Unit-to-Unit Call from DMC	*P*	*P*	*P*
2.6.5.4.2	Test Case 2 – Initiate Unit-to-Unit Call from SU 1	*P*	*P*	*P*
2.6.6	**Encryption**			
2.6.6.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*
2.7.1	**Emergency Alarm to Dispatch and/or other Monitoring Console**			
2.7.1.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*
2.7.2	**Call Alert**			
2.7.2.4.1	Test Case 1 – Initiate Call Alert Request from DMC	*P*	*P*	*U4*
2.7.2.4.2	Test Case 2 – Initiate Call Alert Request from SU 1	*P*	*P*	*U4*
2.7.3	**Radio Check**			
2.7.3.4.1	Test Case 1 – Initiate Radio Check from DMC	*P*	*U4*	*U4*
2.7.4	**Radio Unit Inhibit**			
2.7.4.4.1	Test Case 1 – Radio Unit Inhibit from DMC	*P*	*U4*	*U4*
2.7.5	**Radio Unit Uninhibit**			
2.7.5.4.1	Test Case 1 – Radio Unit Uninhibit from DMC	*P*	*U4*	*U4*
2.7.6	**Message Update**			
2.7.6.4.1	Test Case 1 – Message Update from DMC	*U*	*U4*	*U4*
2.7.6.4.2	Test Case 2 – DMC to Group Message Update	*U*	*U*	*U4*
2.7.6.4.3	Test Case 3 – SU 1 to DMC Message Update	*U*	*U*	*U*
2.7.6.4.4	Test Case 4 – SU 1 to Group Message Update	*P*	*U*	*U4*
2.7.7	**Status Update**			
2.7.7.4.1	Test Case 1 – Status Update from SU 1 to DMC	*U*	*U*	*U*
2.7.7.4.2	Test Case 2 – Talk Group Status Update Initiated by SU 1	*P*	*U*	*U4*
2.7.8	**Status Query**			

2.7.8.4.1	Test Case 1 – Status Query Initiated by DMC	*P*	*U*	*U4*
2.7.9	**Radio Unit Monitor**			
2.7.9.4.1	Test Case 1 – Radio Unit Monitor Initiated by DMC – Group Call	*P*	*U*	*U4*
2.7.9.4.2	Test Case 2 – Radio Unit Monitor Initiated by DMC – Unit-to-Unit Call	*U*	*U*	*U4*

Trunked Subscriber Unit Interoperability - FDMA (2017 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.4 - Trunked Subscriber Unit Interoperability – FDMA (Phase 1)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - FDMA

Base Station Repeater Vendor	Model Name	Abbrev.	Detailed Test Report #
Motorola Solutions	GTR 8000	MSI GTR 8000	DTR-P25CAP081011-P1850004-FDMA-ASTRO25; DTR-P25CAP081011-APX8000
EF Johnson Technologies	4500 Repeater	EFJ 4500	DTR-P25CAP081010-09111601; DTR-P25CAP081010-09111601
Harris Corporation	MASTR V	L3Harris MASTR V	DTR-P25CAP081017-1180424M; DTR-P25CAP081017-1110120M02

The 'test case' number refers to the test suite paragraph number and test case number in TIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - FDMA (2016&2017 CAB)

***Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Test Case	Description	MSI GTR 8000	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	EFJ 4500	Product 2 Result Inter-SYS Roaming	L3Harris MASTR V	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**								
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.1.4.2	Test Case 2 – Denied or Refused Registration	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.1.4.3	Test Case 3 – Unverified Registration	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**								
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.2.4.2	Test Case 2 – Group Call Denied	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.2.4.4	*** Test Case 4 – Group Call Interrupt ***	*P*	*P*	*P*			*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**								
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*P*	*P*	*U4*
2.2.3.4.2	Test Case 2 - Unit-to-Unit Call with Target Availability Check- Denied by Target	*P*	*U4*	*U4*	*P*	*U4*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*U4*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*P*	*P*	*U4*
2.2.3.4.7	Test Case 7 – Unit-to-Unit Call Denied	*P*	*U4*	*U4*	*P*	*U4*	*P*	*P*	*U4*
2.2.4	**Broadcast Voice Call**								
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.5	**Affiliation**								
2.2.5.4.1	Test Case 1 – Radio Permitted to Affiliate with New Group	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.5.4.2	Test Case 2 – Radio Denied Affiliation to New Group	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**								
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.7	**Emergency Alarm**								
2.2.7.4.1	Test Case 1 – Emergency Alarm	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**								
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.10	**Encryption**								
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.11	**Intra-Location Registration Area Roaming**								
2.2.11.4.1	Test Case 1 – Idle Radio	*P*	*P*	*P*	*P*	*U4*	*P*	*P*	*U4*
2.2.13	**Deregistration *** **								
2.2.13.4.1	Test Case 1 – Deregistration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call *** **								
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*P*	*U4*	*U4*	*U4*
2.2.15	**Call Alert *** **								
2.2.15.4.1	Test Case 1 – Call Alert	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*U4*
2.2.16	**Short Message *** **								
2.2.16.4.1	Test Case 1 – Short Message	*U*	*U*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.17	**Status Query *** **								
2.2.17.4.1	Test Case 1 – Status Query	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.18	**Status Update *** **								
2.2.18.4.1	Test Case 1 – Status Update	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*U4*
2.2.19	**Radio Unit Monitoring *** **								
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.20	**Radio Unit Disable/Re-Enable *** **								

2.2.20.4.1	Test Case 1 – Radio Unit Disable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*U4*
2.2.20.4.2	Test Case 2 – Radio Unit Re-Enable	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*U4*
2.2.21	**Radio Check *****								
2.2.21.4.1	Test Case 1 – Radio Check Successful	*P*	*U4*	*U4*	*P*	*P*	*U4*	*U4*	*U4*

*** Test case included in the 2017 Test Requirements CAB. Leave test case result empty if submitting under the 2016 Test Requirements CAB.

Trunked Subscriber Unit Interoperability - TDMA (2017 CAB)

(leave test section empty for 2016 CAB)

CAB Test Section Identification

P25-CAB-CAI_TEST_REQ – July 2017, Section 2.1.3.5 - Trunked Subscriber Unit Interoperability – TDMA (Phase 2)

Representative Trunked Base Station Repeater Products tested with the Subscriber Unit for Trunked Interoperability - TDMA

Base Station Repeater Vendor	Model Name	Abbrev.	Detailed Test Report #
Motorola Solutions	GTR 8000	MSI GTR 8000	DTR-P25CAP081011-P1850004-TDMA-ASTRO25
EF Johnson Technologies	4500 Repeater	EFJ 4500	DTR-P25CAP081010-18111101
Harris Corporation	MASTR V	L3Harris MASTR V	DTR-P25CAP081017-1180424M

The 'test case' number refers to the test suite paragraph number and test case number inTIA-102.CABC-C Interoperability Testing for Voice Operation in Trunked Systems

Trunked Subscriber Unit Interoperability Tests - TDMA (2017 CAB)

Test Case	Description	MSI GTR 8000	Product 1 Result Inter-SYS Roaming	Product 1 Result Inter-WACN Roaming	EFJ 4500	Product 2 Result Inter-SYS Roaming	L3Harris MASTR V	Product 3 Result Inter-SYS Roaming	Product 3 Result Inter-WACN Roaming
2.2.1	**Full Registration**								
2.2.1.4.1	Test Case 1 – Valid Registration	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2	**Group Voice Call**								
2.2.2.4.1	Test Case 1 – Group Call Granted	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.3	Test Case 3 – Group Call Request Queued	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.2.4.4	Test Case 4 – Group Call Interrupt	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3	**Unit-to-Unit Voice Call**								
2.2.3.4.1	Test Case 1 – Unit-to-Unit Call with Target Availability Check	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.3	Test Case 3 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment After Target Availability Check	*P*	*U4*	*U4*	*P*	*P*	*P*	*P*	*U4*
2.2.3.4.4	Test Case 4 – Unit-to-Unit Call Queued with Target Availability Check – Traffic Channel Assignment Before Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check	*U4*	*U4*	*U4*	*U4*	*U4*	*U*	*U*	*U4*
2.2.4	**Broadcast Voice Call**								
2.2.4.4.1	Test Case 1 – Broadcast Voice Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.6	**Announcement Group Call**								
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.8	**Emergency Group Call**								
2.2.8.4.1	Test Case 1 – Emergency Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.10	**Encryption**								
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*U4*
2.2.14	**System Call**								
2.2.14.4.1	Test Case 1 – System Call	*U4*	*U4*	*U4*	*P*	*U4*	*U4*	*U4*	*U4*
2.2.19	**Radio Unit Monitoring**								
2.2.19.4.1	Test Case 1 – Individual Non-Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.2	Test Case 2 – Individual Silent	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.3	Test Case 3 – Group Non-Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.19.4.4	Test Case 4 – Group Silent	*P*	*P*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26	**Transmitting Subscriber Forced Preemption**								
2.2.26.4.1	Test Case 1 – TDMA SU Forced Audio Preemption	*U*	*U*	*U*	*U4*	*U4*	*U4*	*U4*	*U4*
2.2.26.4.2	Test Case 2 – TDMA SU Forced Emergency Call Ruthless Preemption	*P*	*P*	*P*	*U4*	*U4*	*P*	*P*	*U4*

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 50 - Programming Documentation

RFP # 549

December 18, 2025

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Motorola Solutions

Section 1

RFP Section 3.42.4.1 Programming Documentation

Programming Documentation has been provided on the following pages.

Use or disclosure of this proposal is subject to the restrictions on the cover page.
Motorola Solutions

KVL5000

QUICK REFERENCE GUIDE

MARCH 2025

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MN005847A01-G

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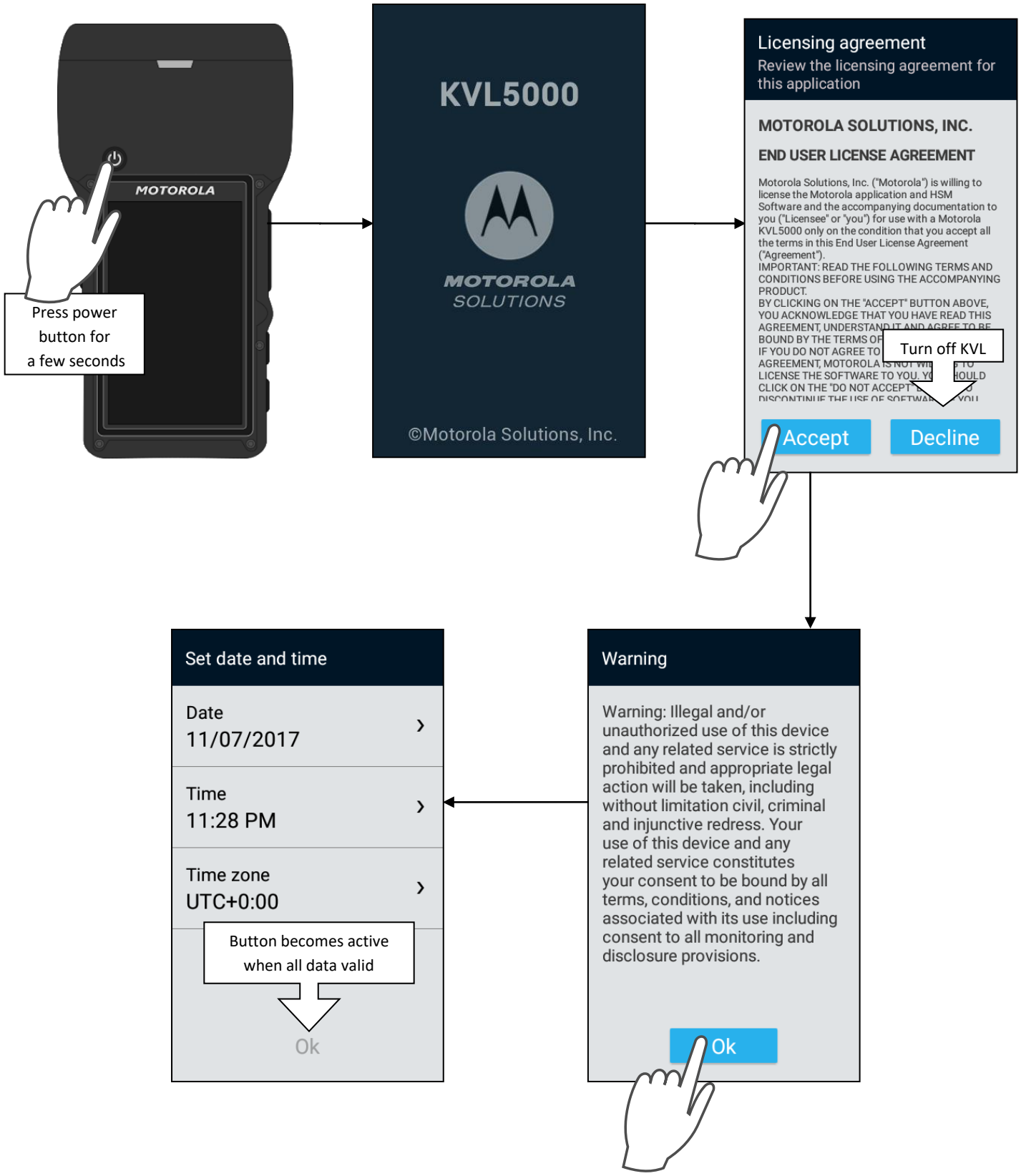
Appendix: KVL Role based Action List 138

First Launch

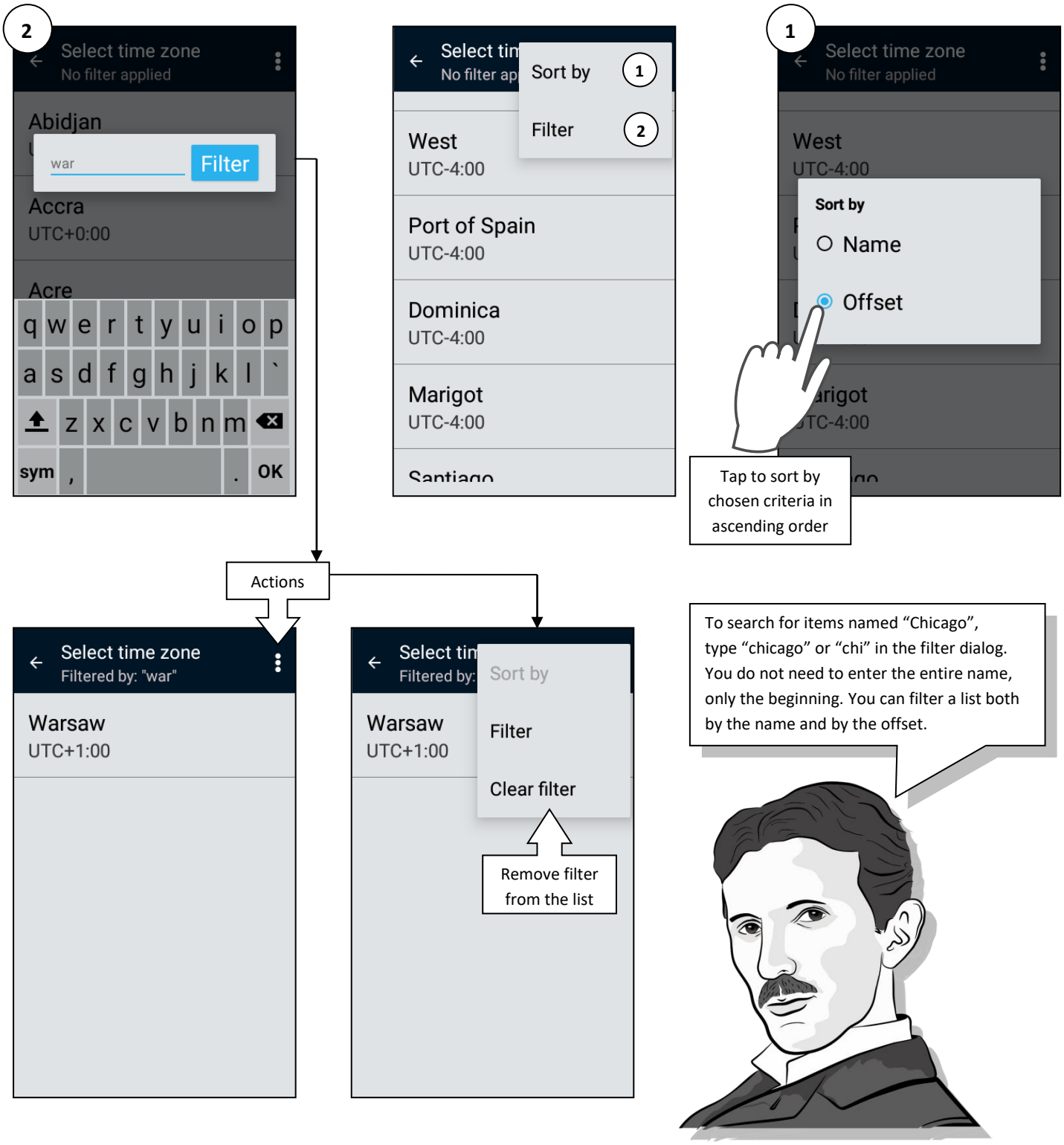
When you launch the Key Variable Loader (KVL) for the first time, you need to configure passwords and set time and date.



Date & Time

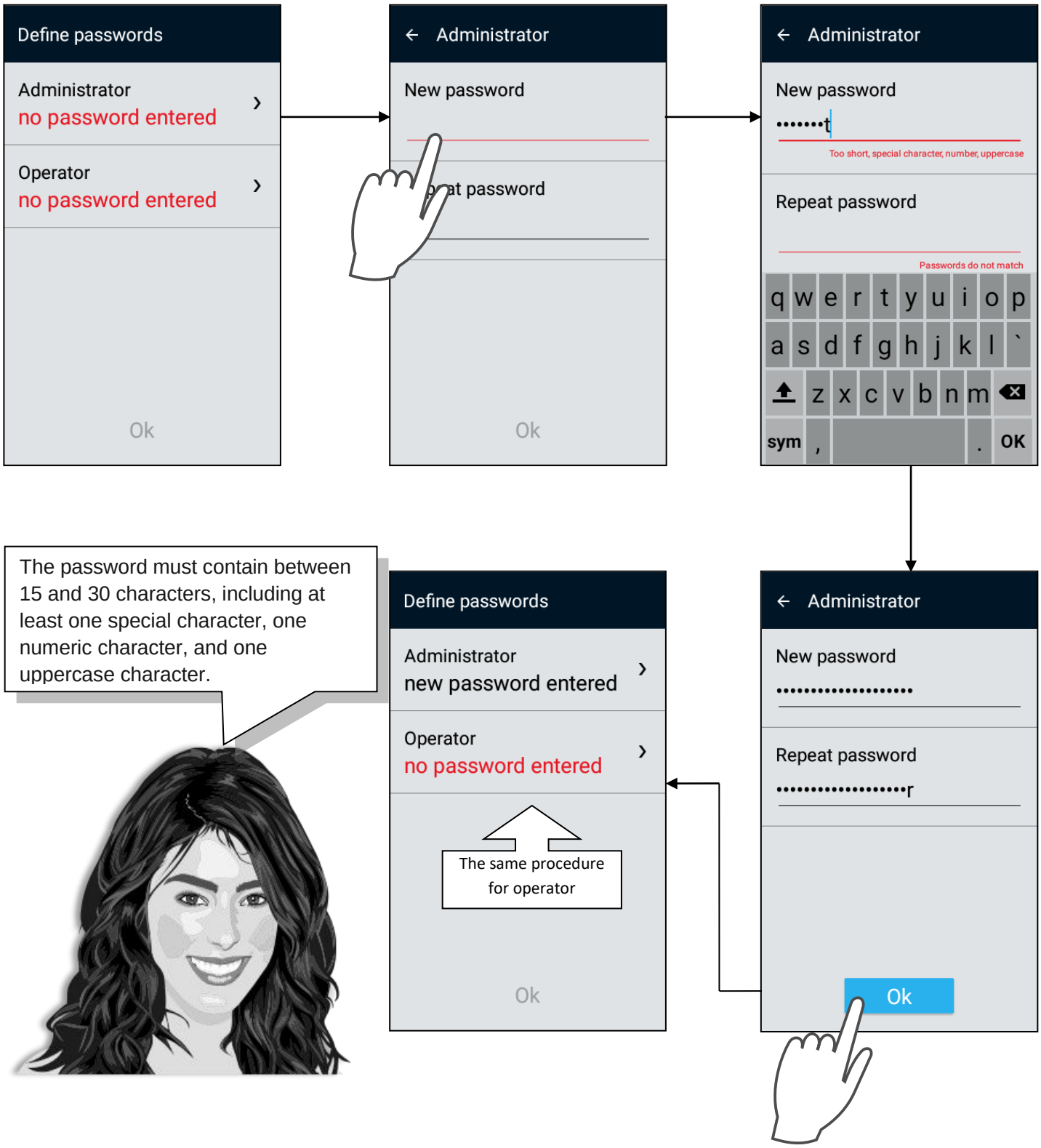
Choose date, time and time zone. You can change these settings later.

Time Zone filtering/sorting options



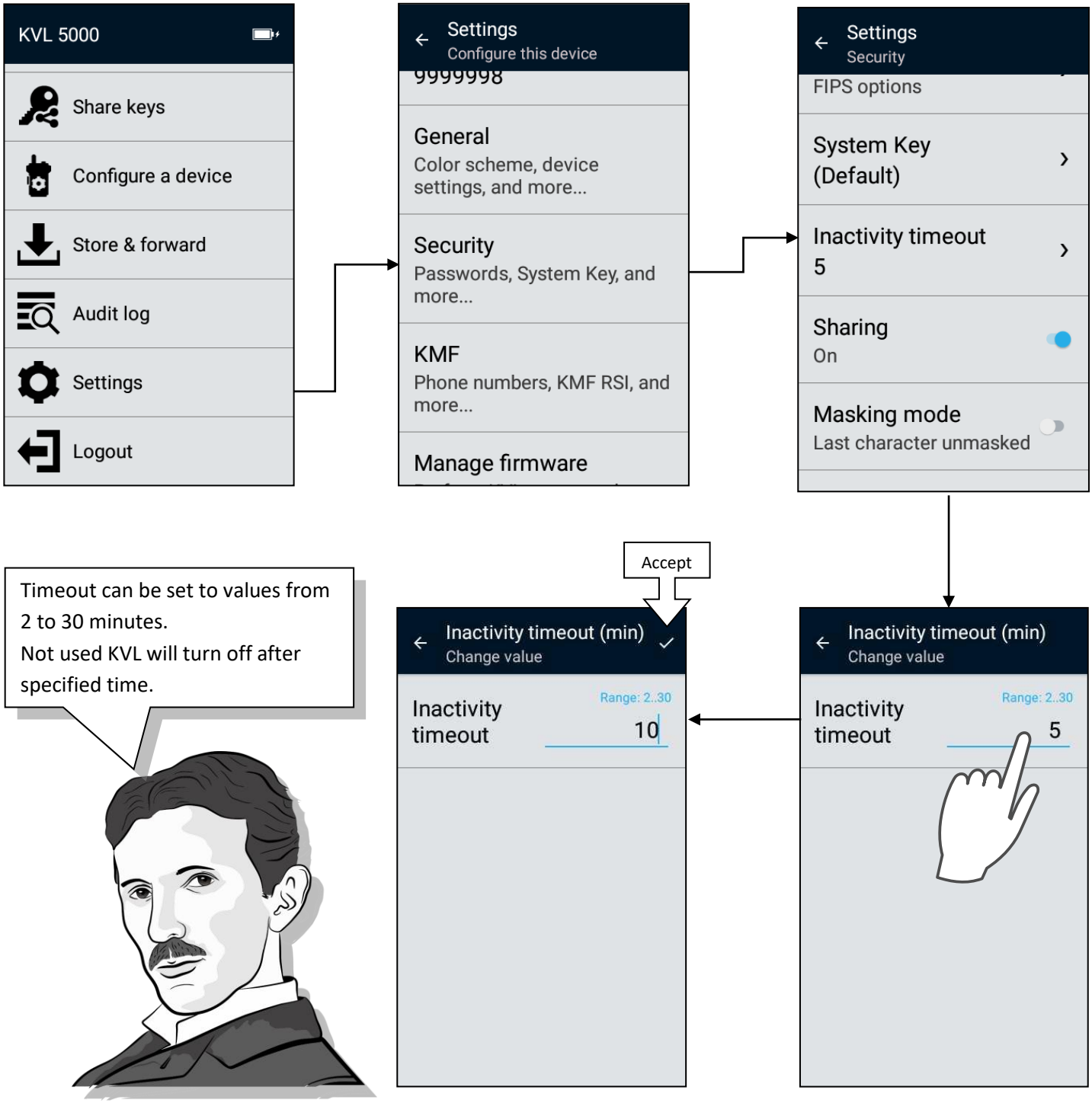
Define passwords

Setup passwords for both Operator and Administrator



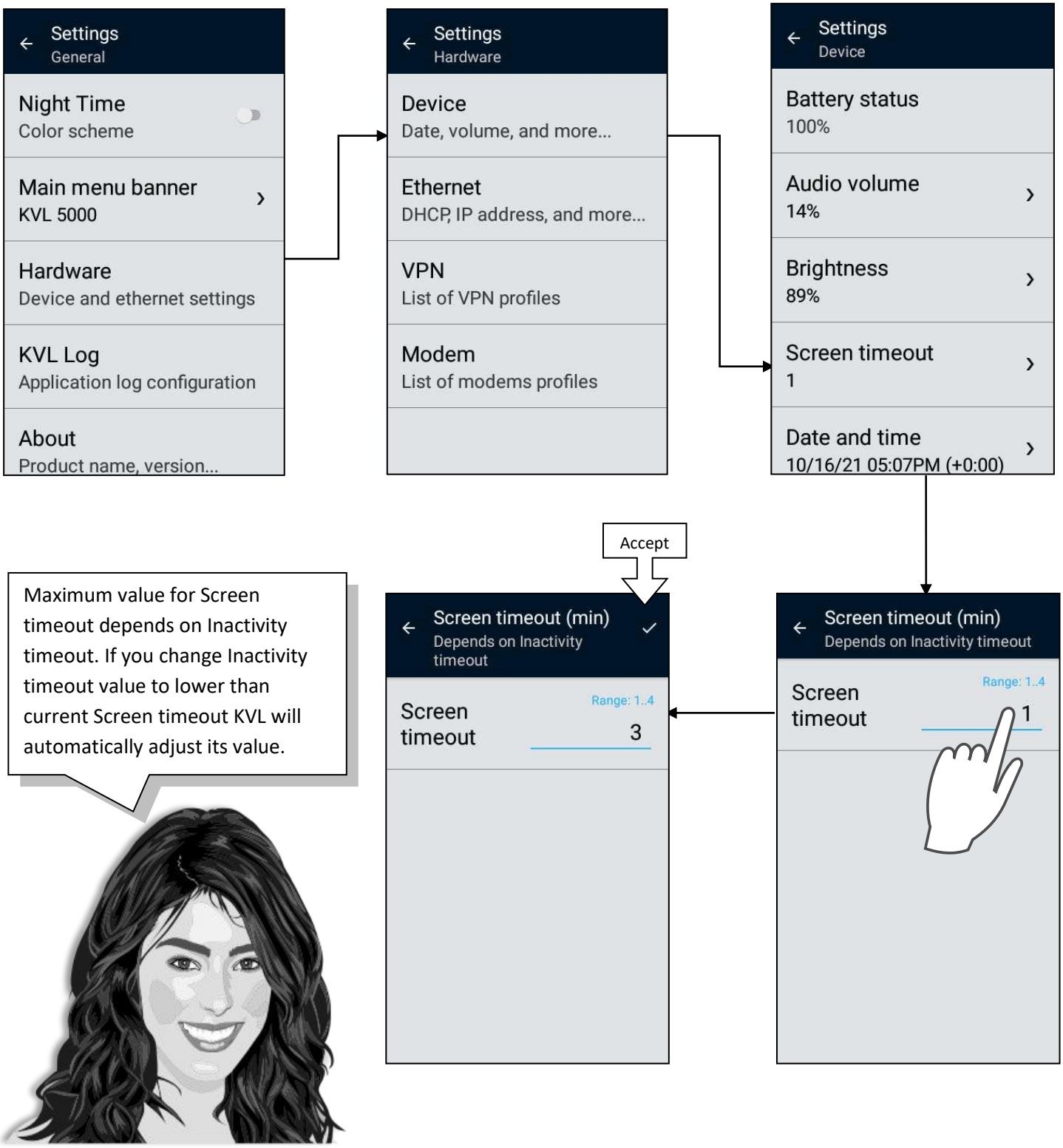
Inactivity timeout

Reduces unnecessary battery drain | Default set to 5 minutes | Only Administrator can change this



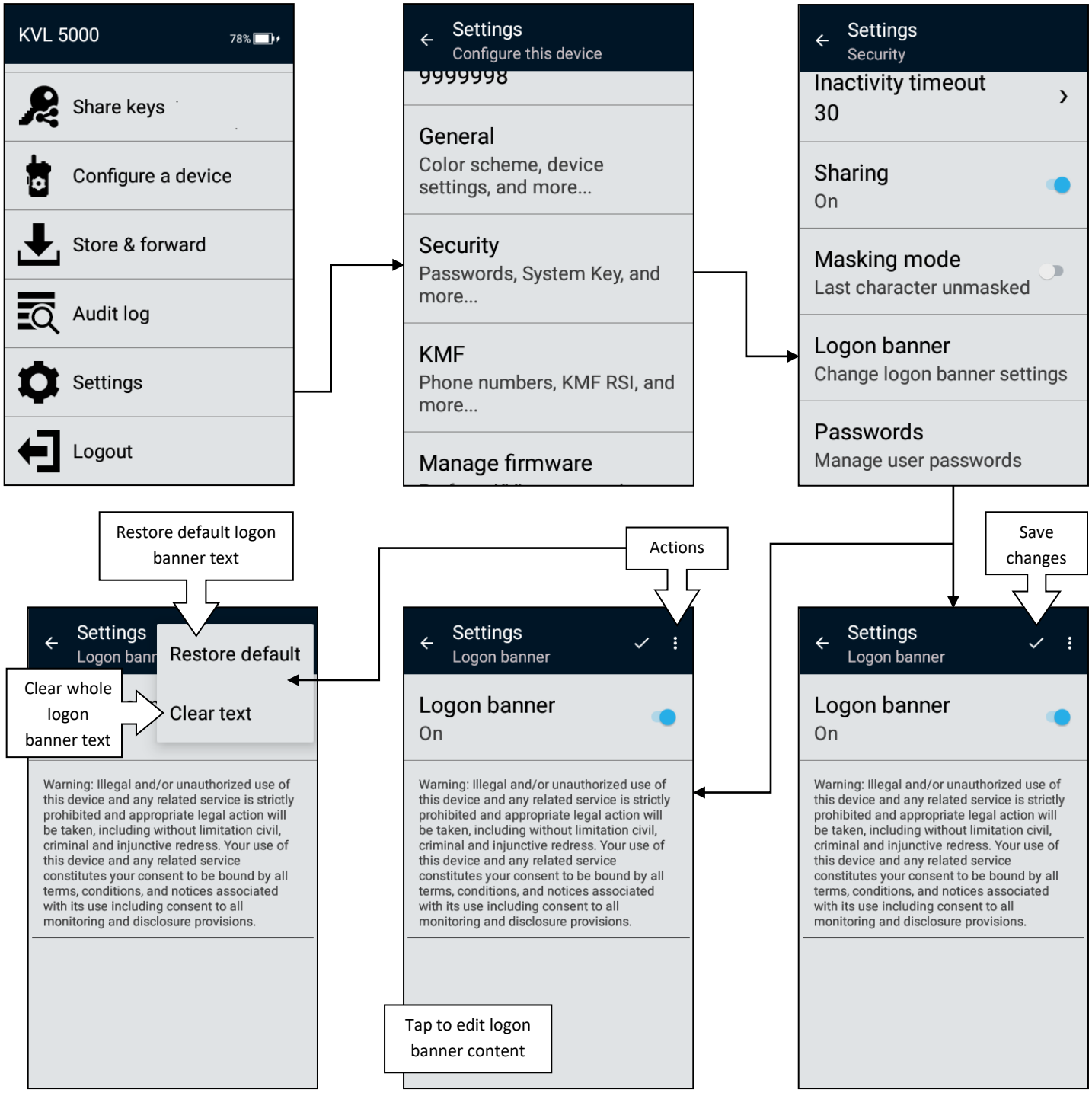
Screen timeout

Allows to set time before KVL's screen turns off | Default set to 1 minute | Depends on Inactivity timeout



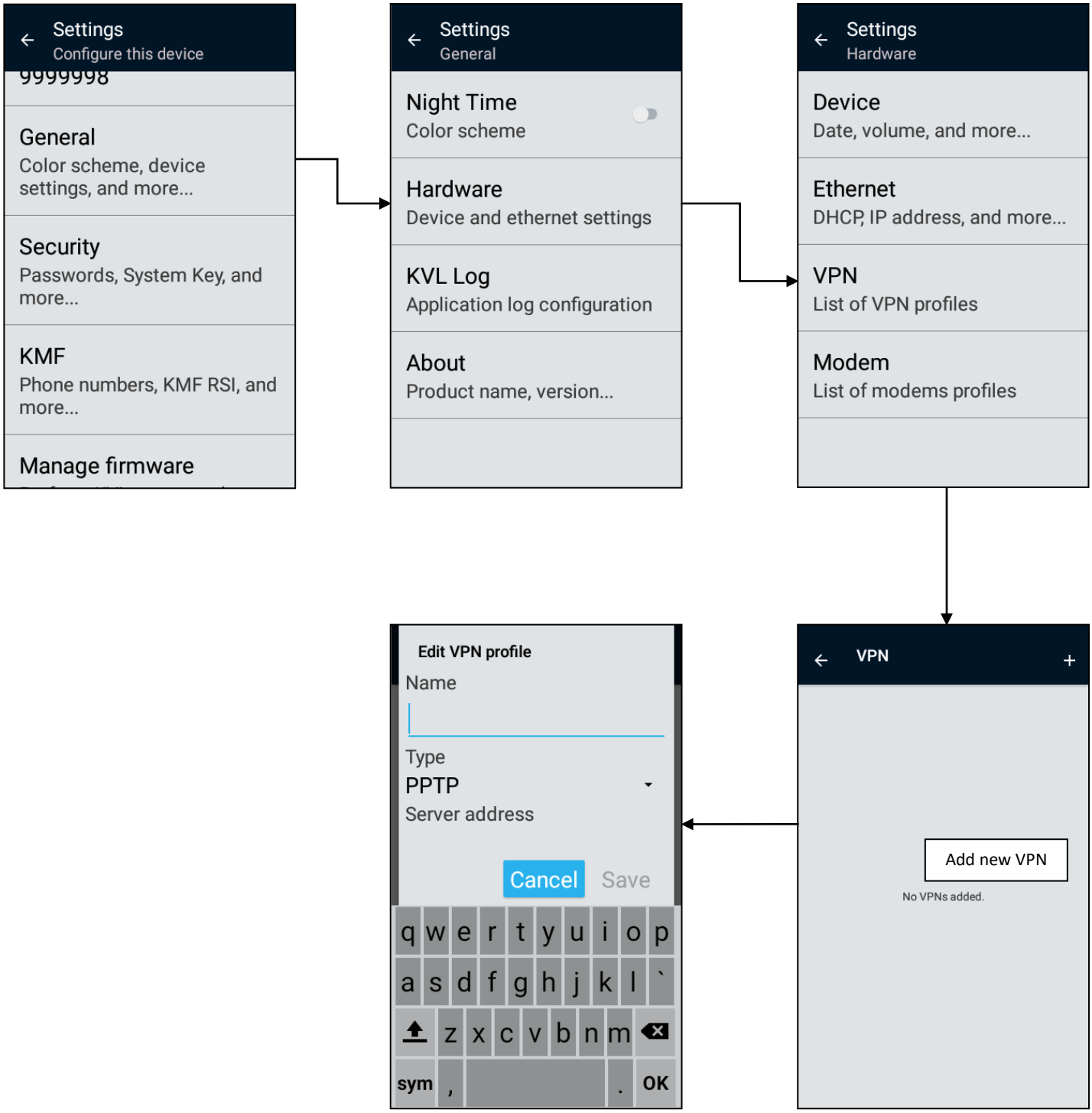
Logon banner

Information displayed when KVL starts | Only administrator can change this



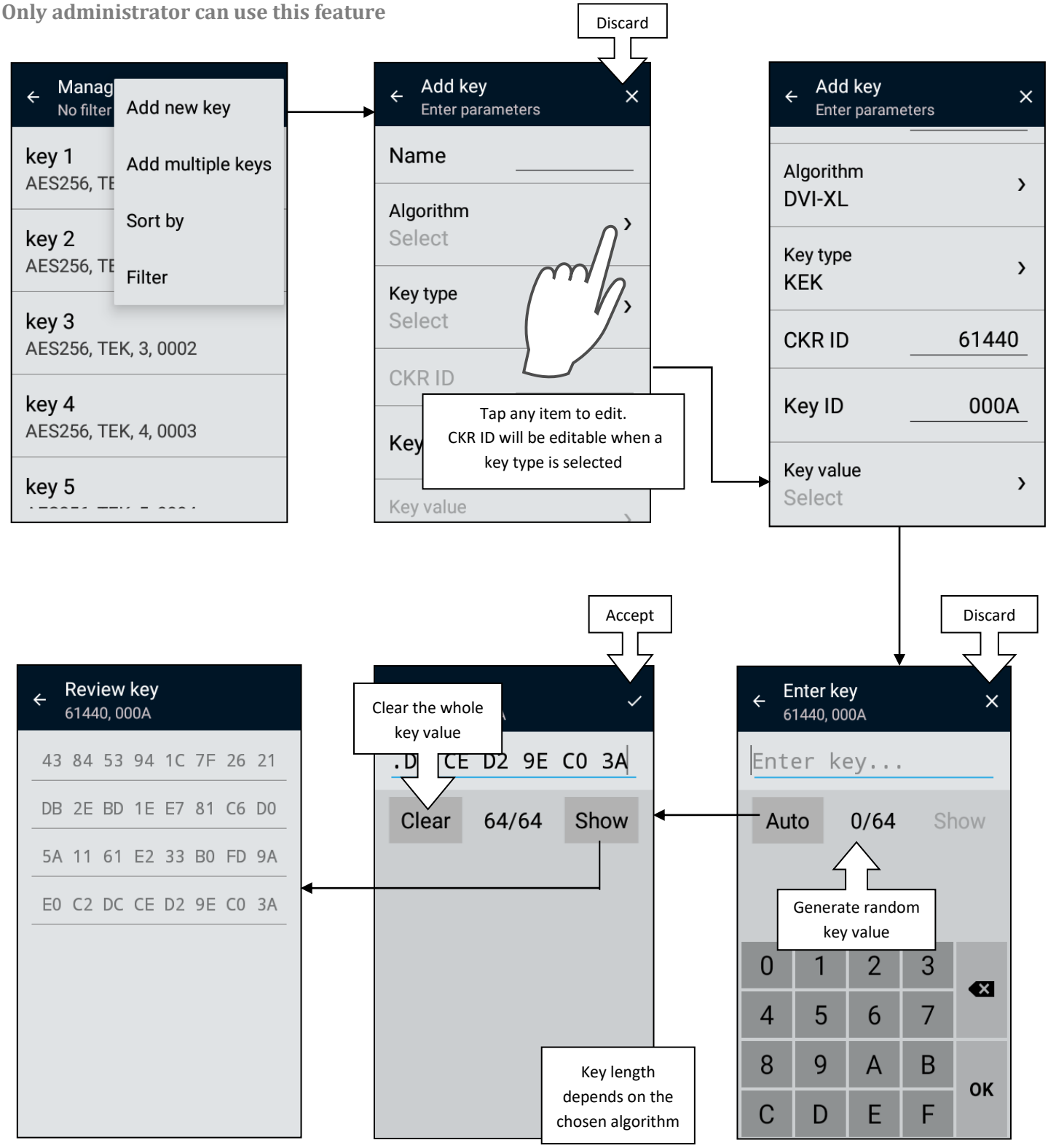
VPN

Setup Virtual Private Networks | Only Administrator can manage this



Add single key

Only administrator can use this feature

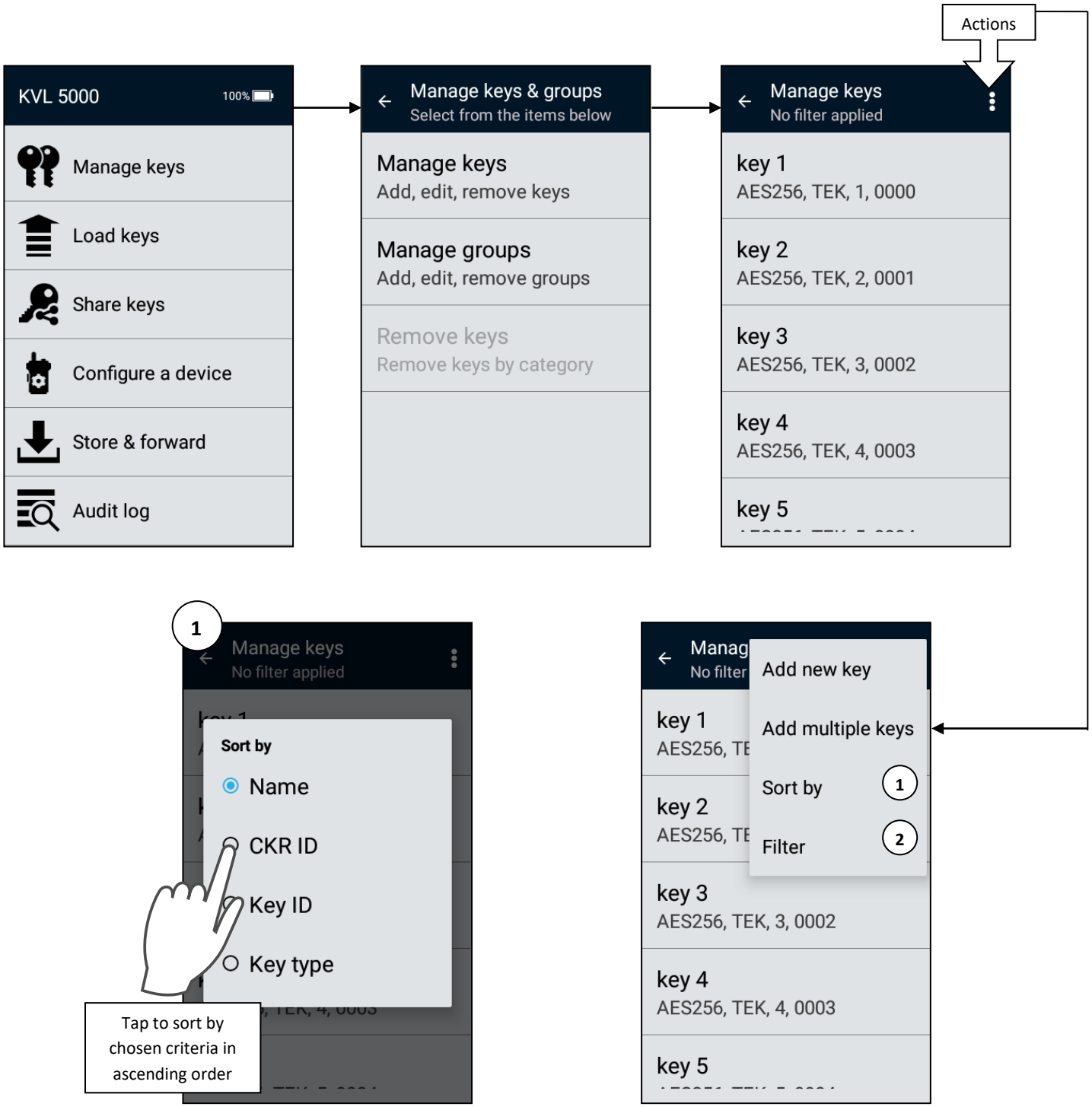


Add multiple keys

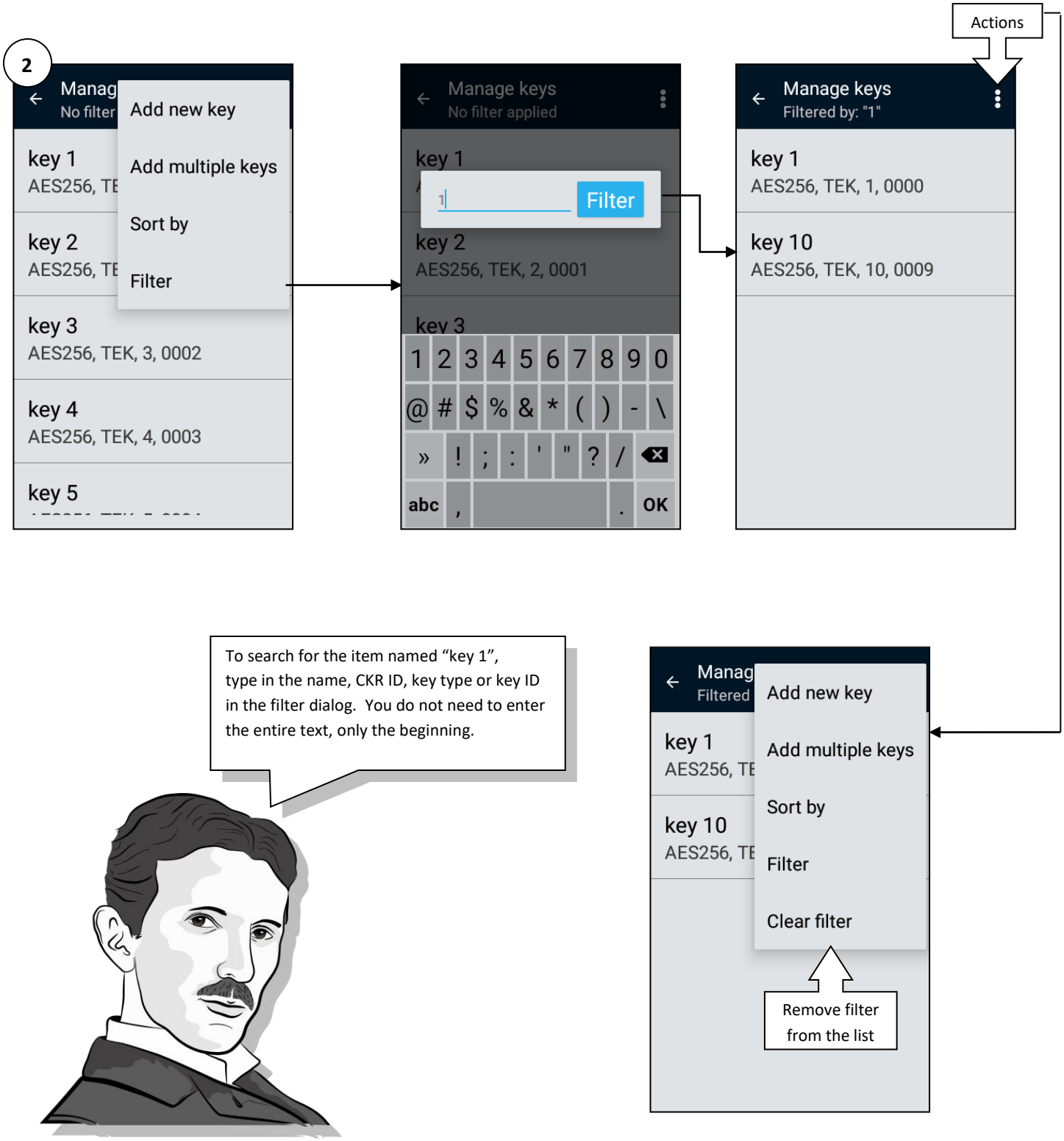
Add sequence of keys with autogenerated value | Only Administrator can manage this

View and sort keys' list

The KVL supports up to 1024 keys at a time



Filter keys' list

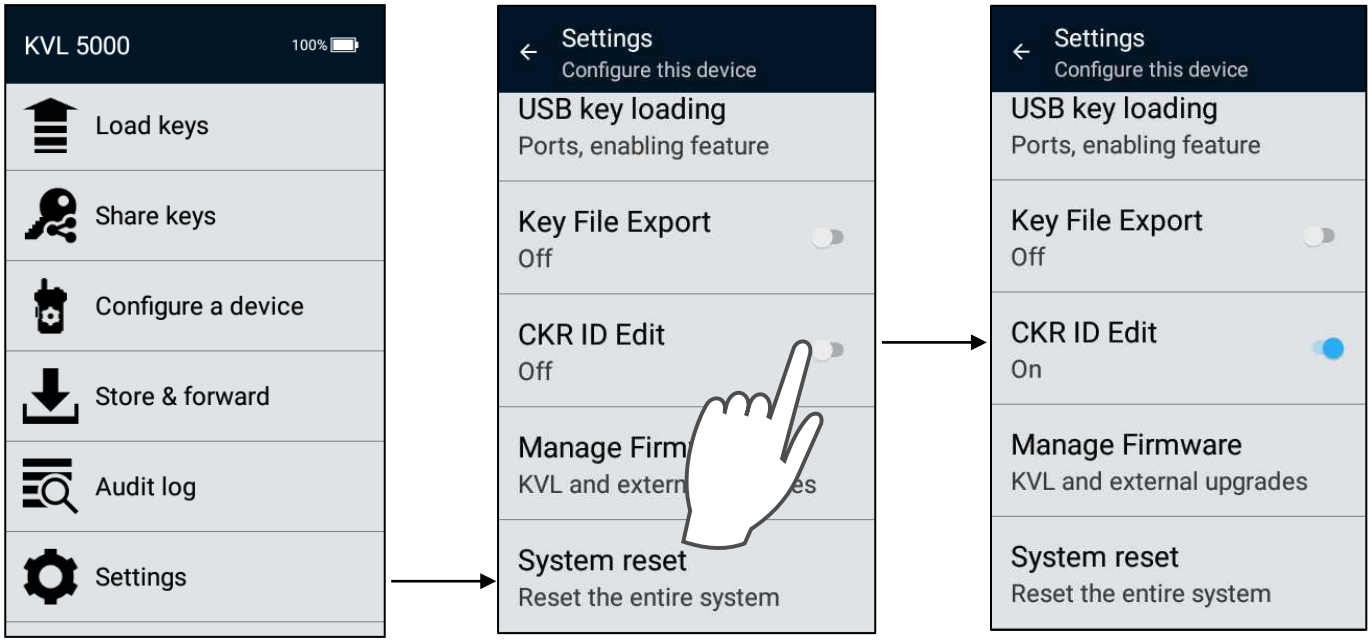


Edit key

Edit name, key ID or key value | Delete the key | Only Administrator can manage this

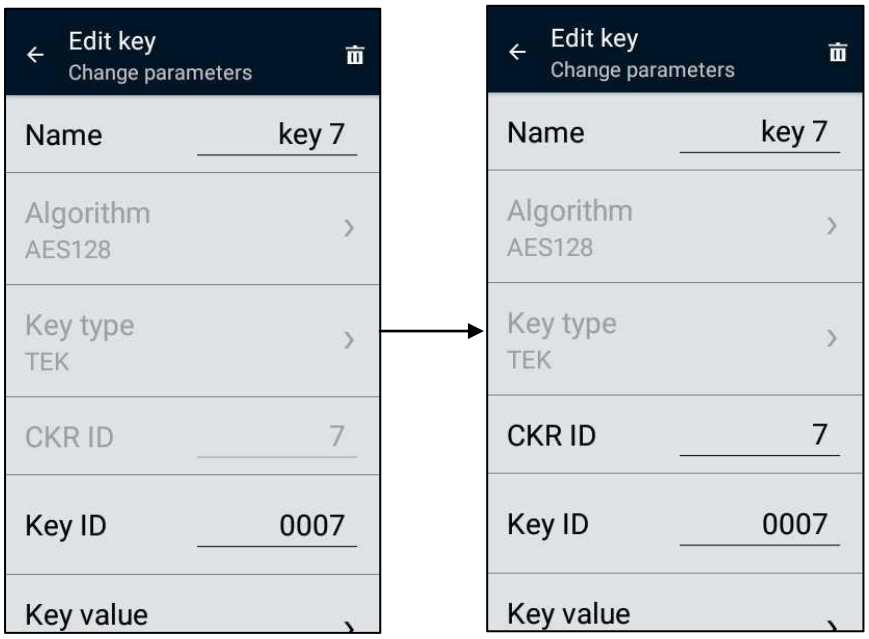
Edit key

Edit CKR ID | Only Administrator can manage this



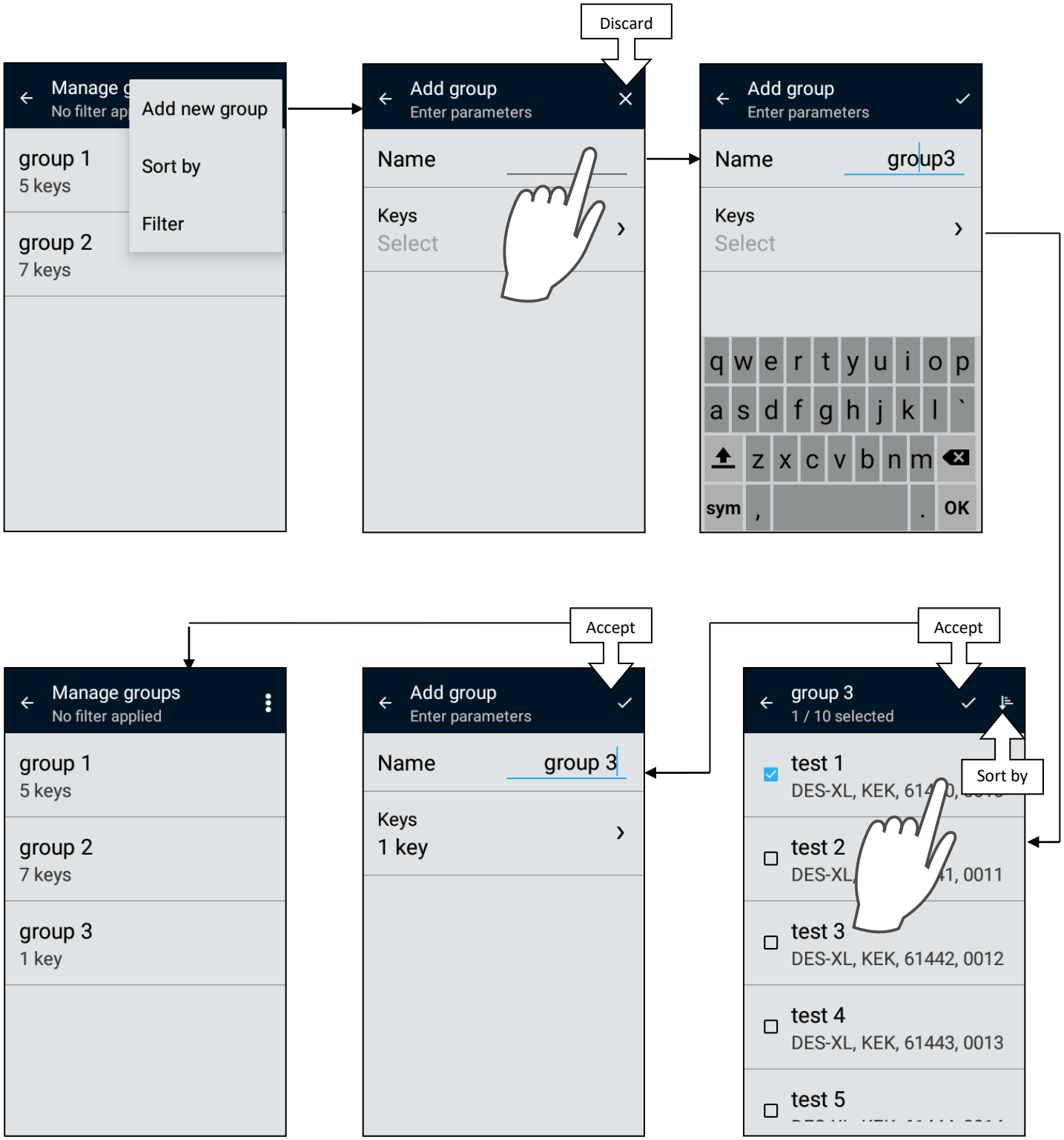
KVL Administrator can enable CKR ID Edit in KVL Settings.

KVL Operator with Manage Keys permission can edit CKR ID when the setting is switched on.



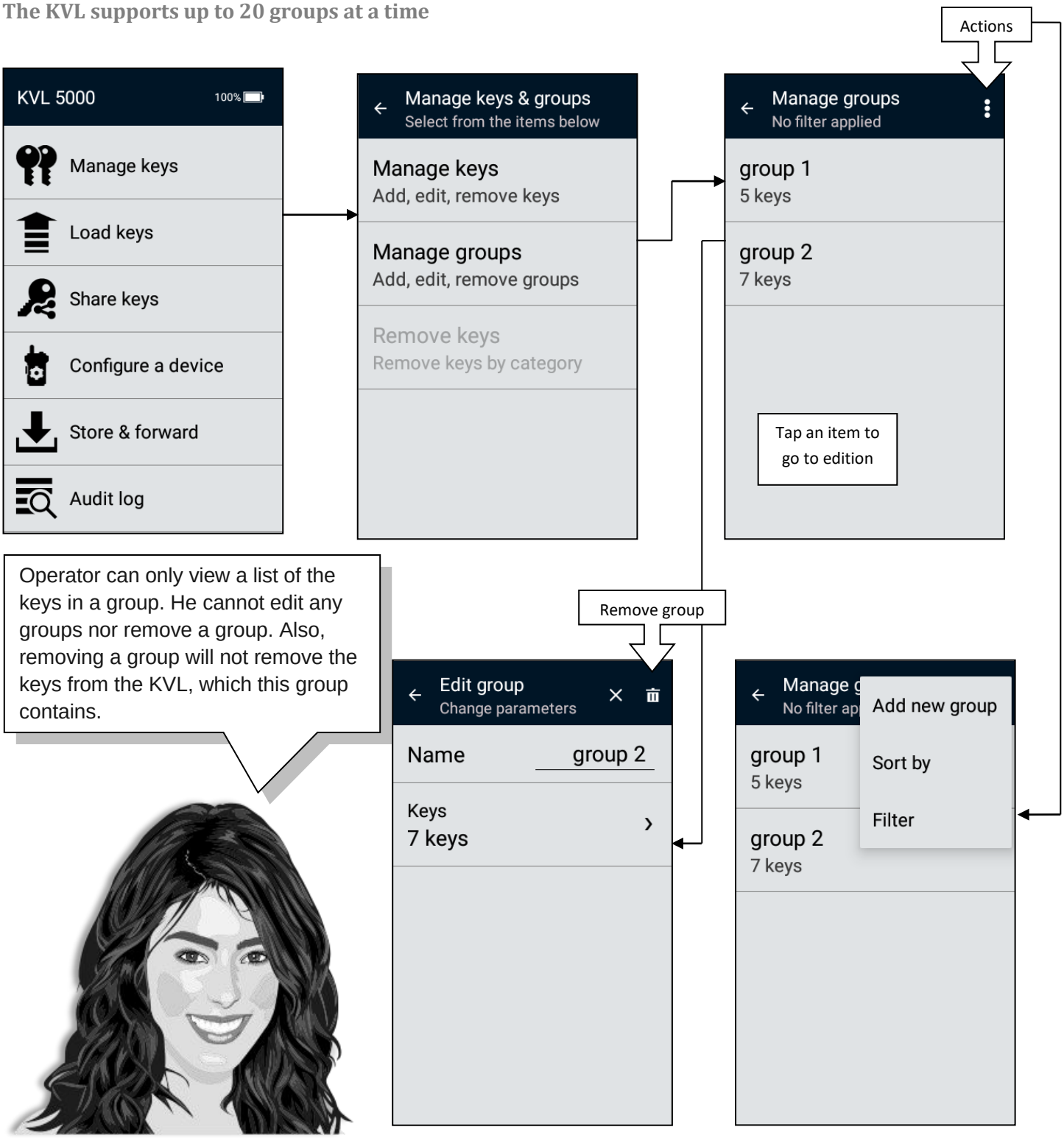
Add new group of keys

Only administrator can use this feature



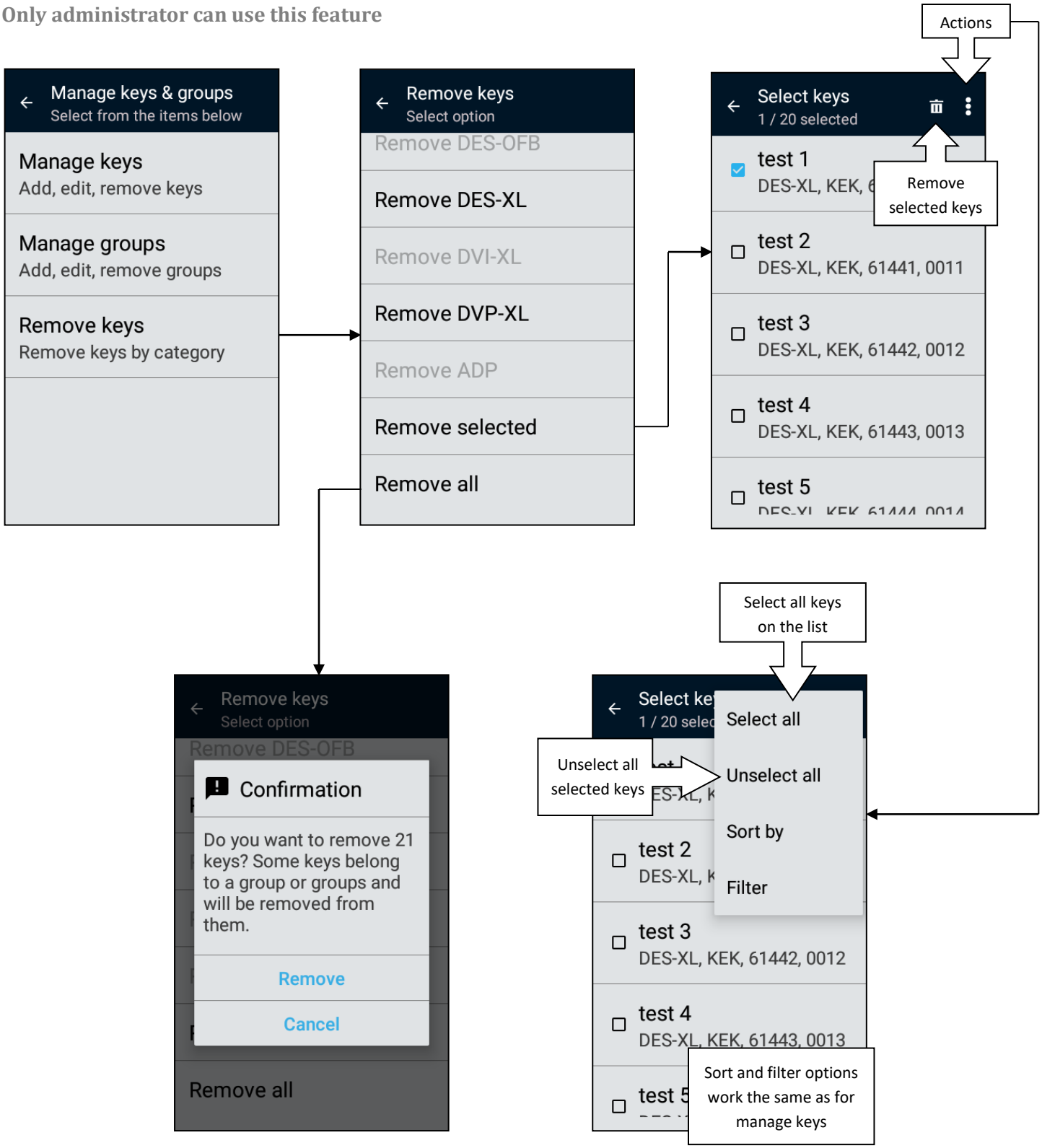
Manage group of keys

The KVL supports up to 20 groups at a time



Remove keys

Only administrator can use this feature



Key Profiles

Key profiles allow the user to manage keys, key groups and Tactical OTAR groups in separate logical storages. This allows much easier interoperability as you can store keys with the same CKR ID or the same key ID and algorithm combination on separate key profiles on one device.

Key Profile Configuration and Customization

The application includes one main Key Profile, which can support up to 1024 keys, and 50 secondary profiles, each capable of holding up to 100 keys. Additionally, each Key Profile has an independent limit for the number of groups and Tactical OTAR groups, with a maximum of 20 allowed for each.

To further aid in organization and identification, KVL Administrator can edit and personalize the name of each Key Profile, ensuring that each can be clearly labeled and easily recognized. The name of the active Key Profile is displayed on all screens that support Key Profile functions, keeping users informed. A quick tap on the hardware button allows users to swiftly navigate to the Key Profile management settings for easy adjustments.

Key Profile Clear

KVL Administrator can also clear given key profile when it is no longer needed or repurposed. Clearing key profile will remove all general keys, key groups and Tactical OTAR groups on given profile.

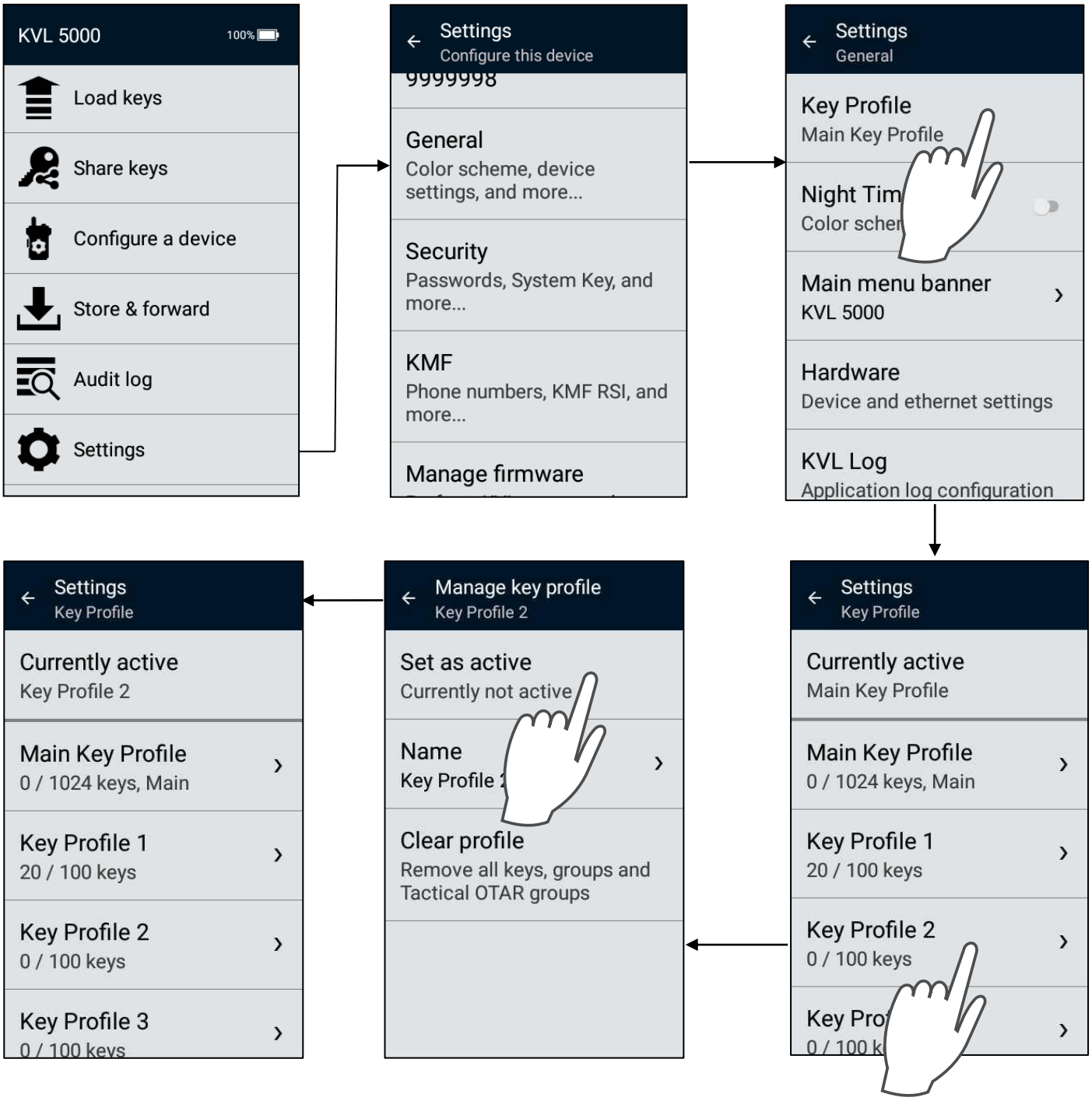
Store & Forward and Radio Authentication

Store & Forward, Radio Authentication and settings for mentioned operations are possible only within the Main Key Profile.

Transferring Keys Between Key Profiles

The application also offers the flexibility to move or copy multiple keys to another Key Profile, provided there are no conflicts, such as duplicate CKR IDs or algorithm and key ID pairs that already exist in the target profile. If any conflicts occur, users will be informed of them via a dedicated screen.

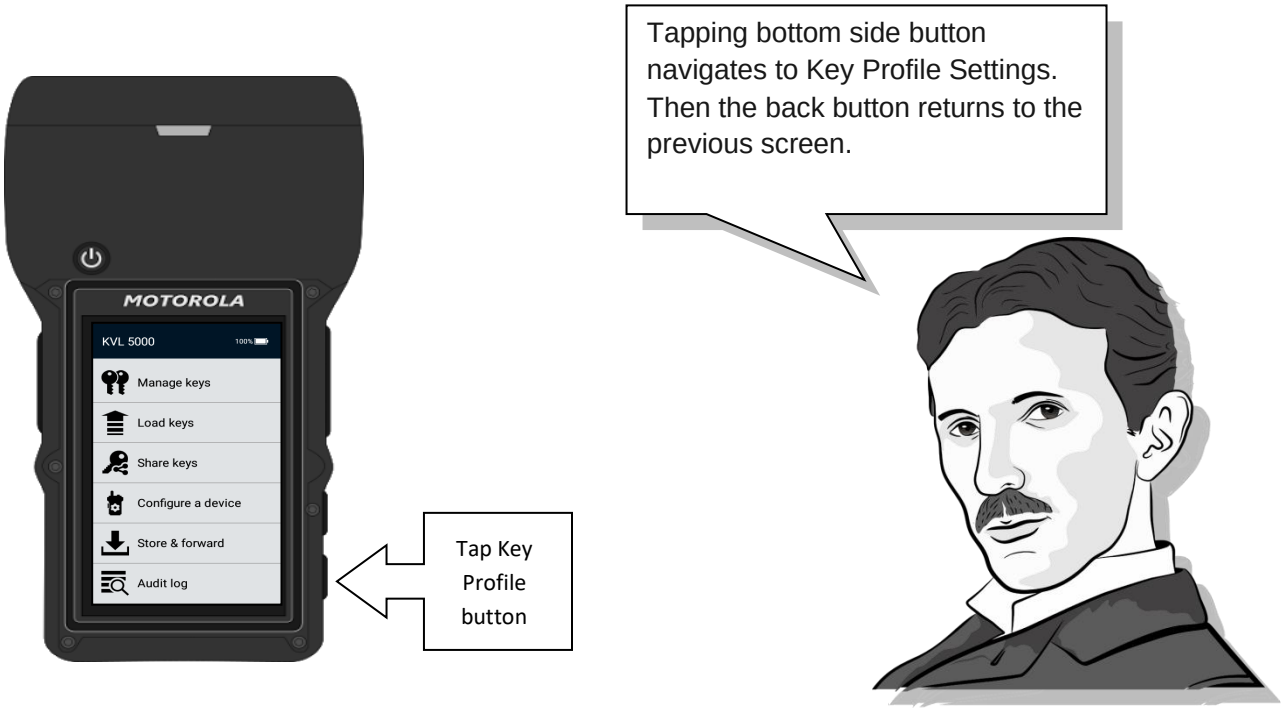
Setting active key profile



Setting active key profile

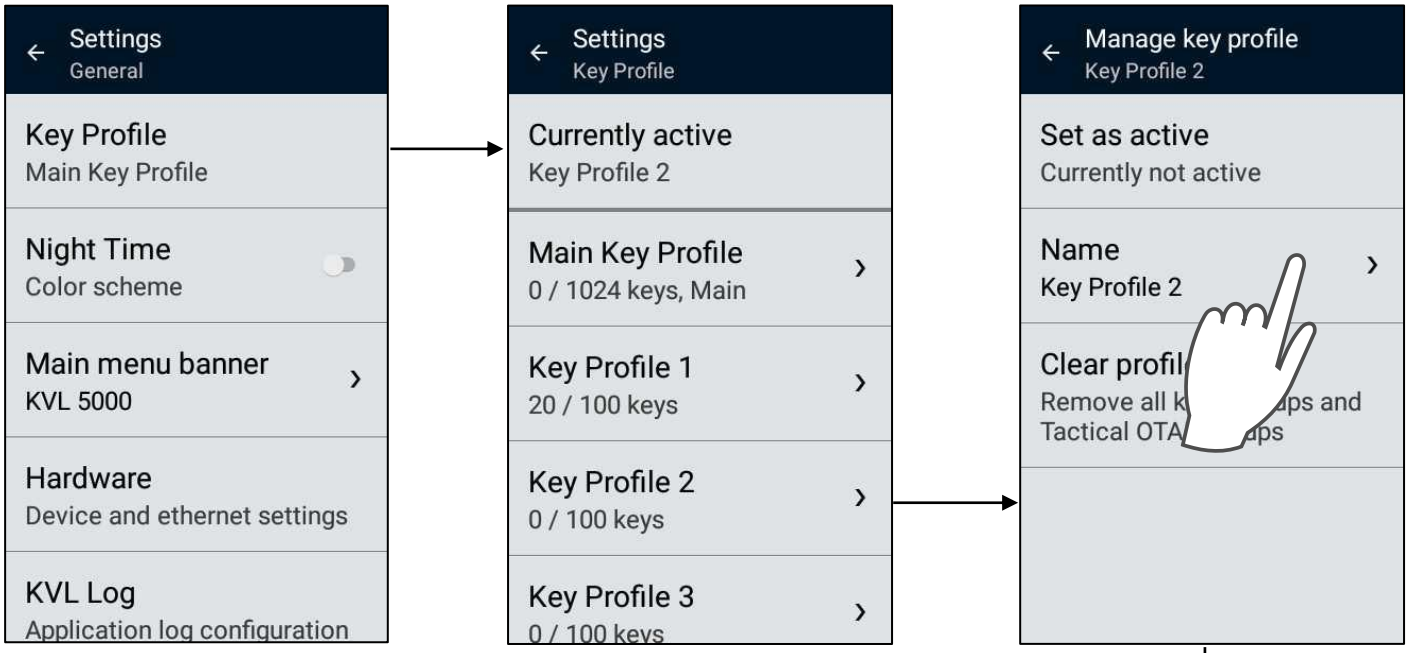
Setting active key profile may be quickly started by tapping the bottom button on the right KVL side. You can use this button to quickly change Key Profile when managing keys.

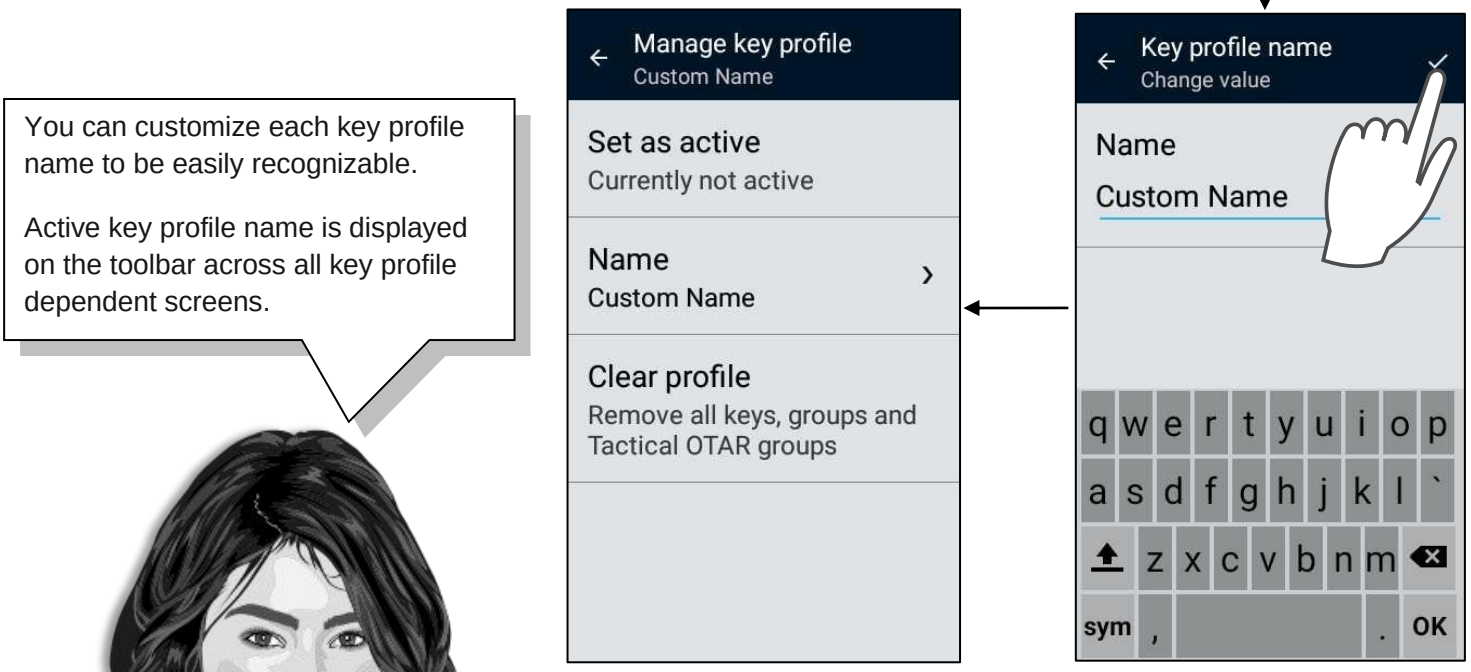
This button is disabled if any operation is in progress (for example share keys or upgrade).



Changing key profile name

Only administrator can use this feature



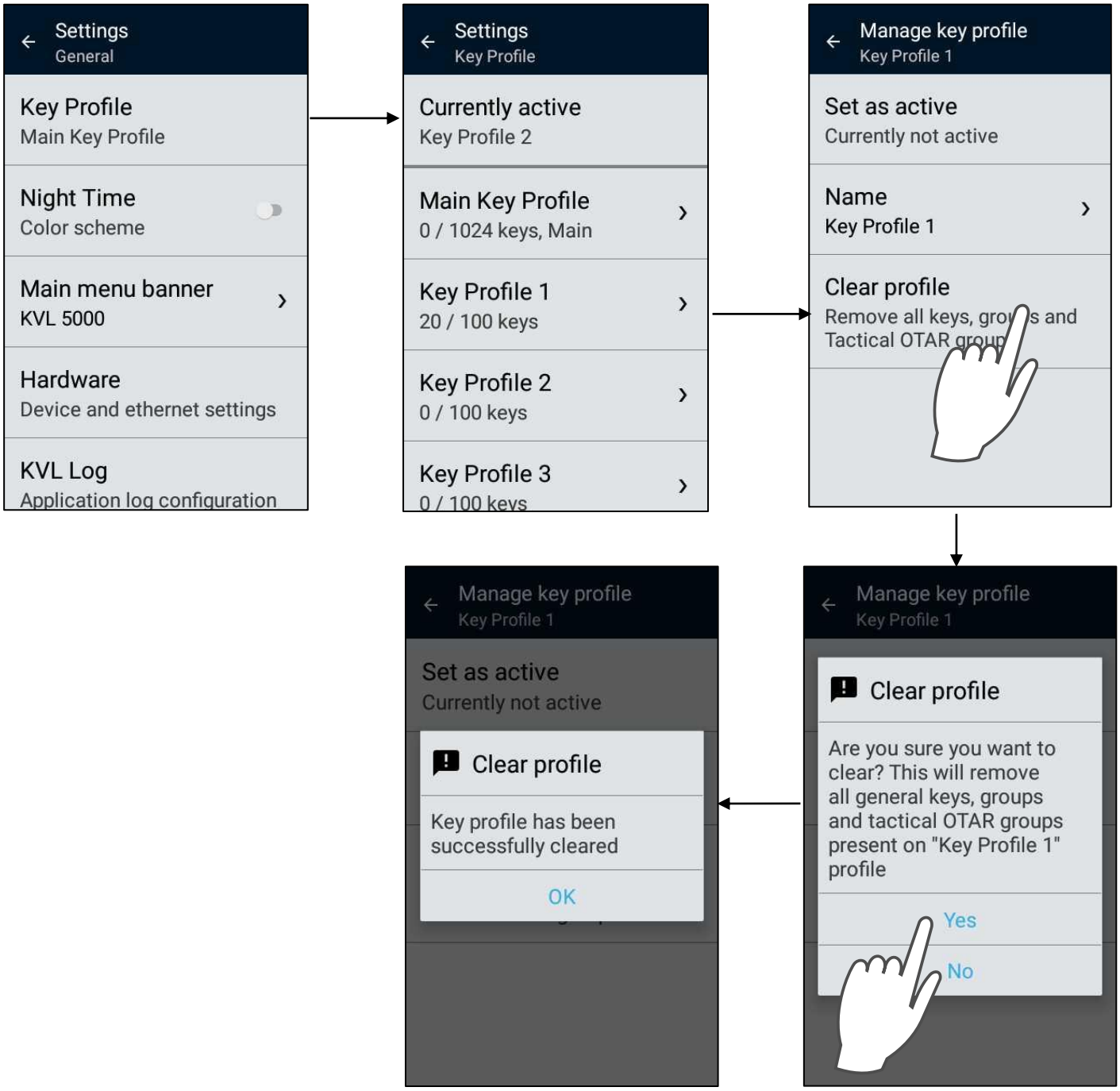


You can customize each key profile name to be easily recognizable.

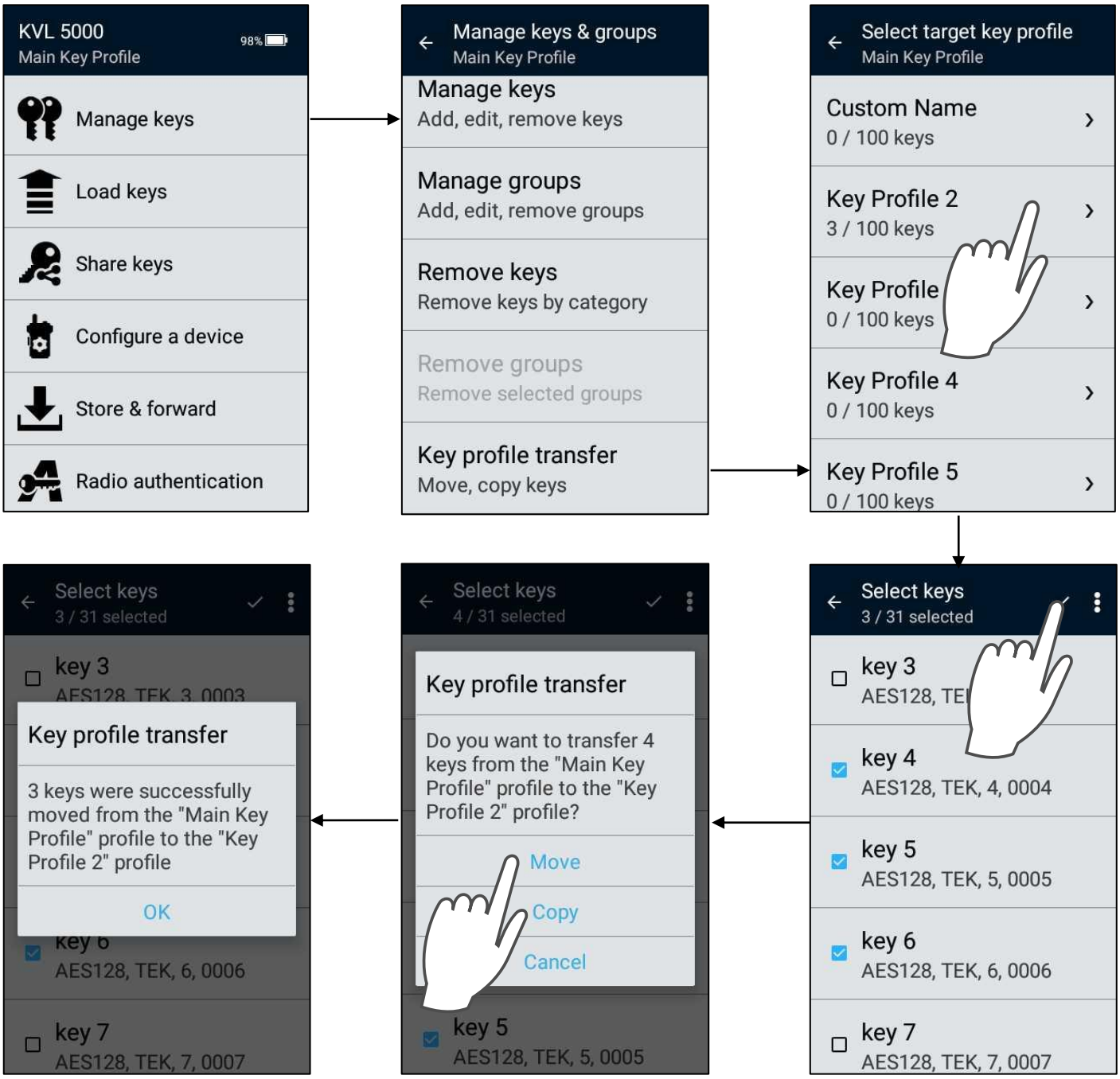
Active key profile name is displayed on the toolbar across all key profile dependent screens.

Clearing key profile

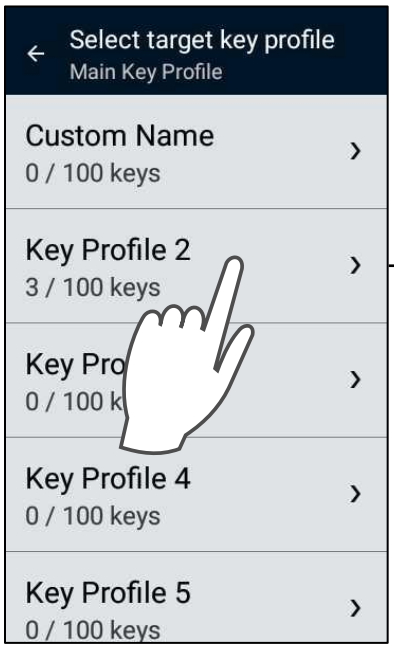
Only administrator can use this feature

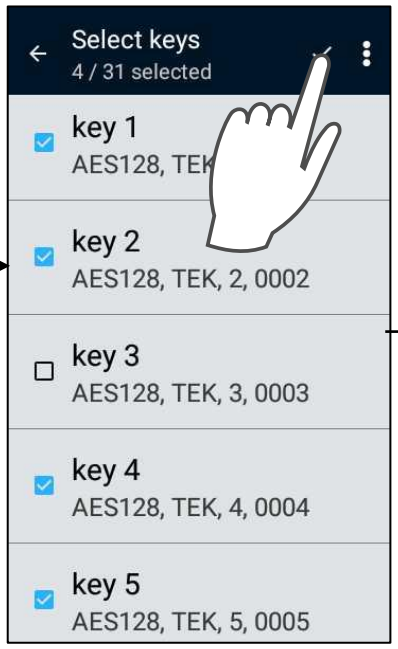


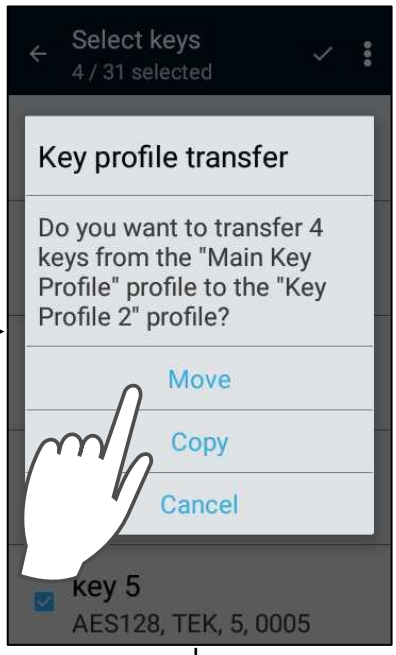
Key profile transfer

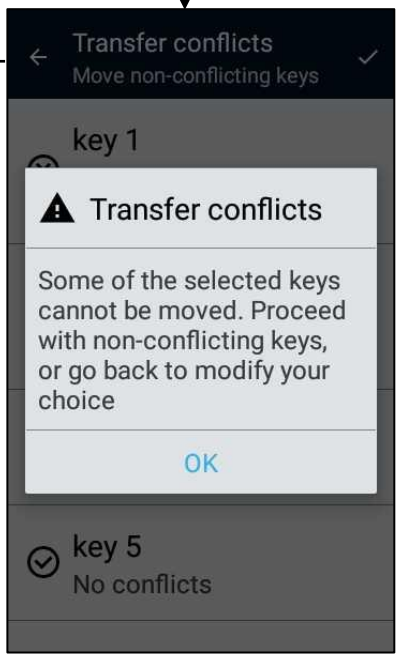


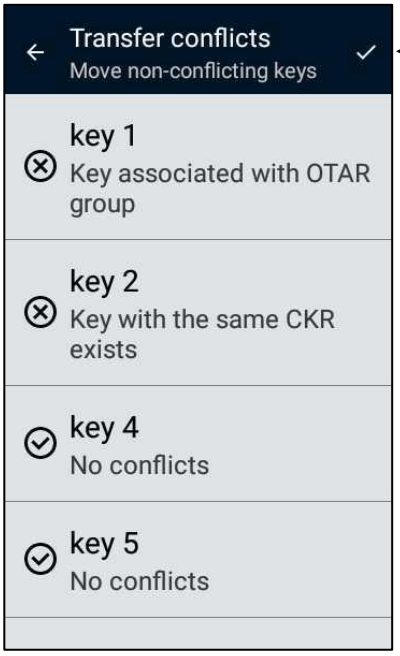
Key profile transfer with conflicting keys











KVL User is informed if there are key profile transfer conflicts for any selected keys. User can choose to transfer non-conflicting keys or go back and resolve conflicts before transfer.

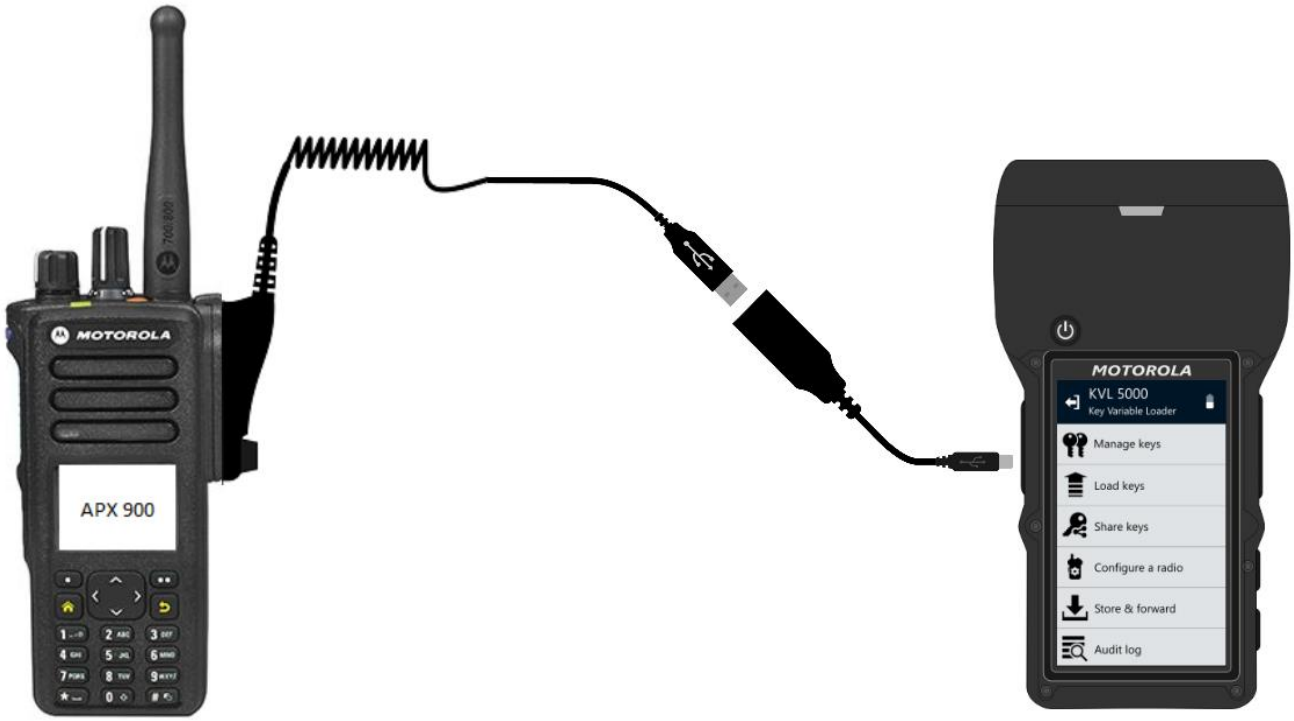
Connect target device to a KVL

In ASTRO ® 25 systems, you can load encryption keys into the following devices:

- Secure ASTRO® 25 Single Key Target Radios
- Secure ASTRO® 25 Multiple Key Target Radios
- MCC 7500 VPM Dispatch Console
- PDEG Encryption Unit
- CAI Data Encryption Module (CDEM)
- KMF CryptR
- CRYPTR micro in User Equipment
- MCC7500E Console CRYPTR

In PS LTE systems, you can load encryption keys into the following devices:

- Secure ASTRO® 25 Single Key Target Radios
- Secure ASTRO^{yt}5 Multiple Key Target Radios
- KMF CryptR
- CRYPTR micro in User Equipment
- Broadband IPCRYPTR2

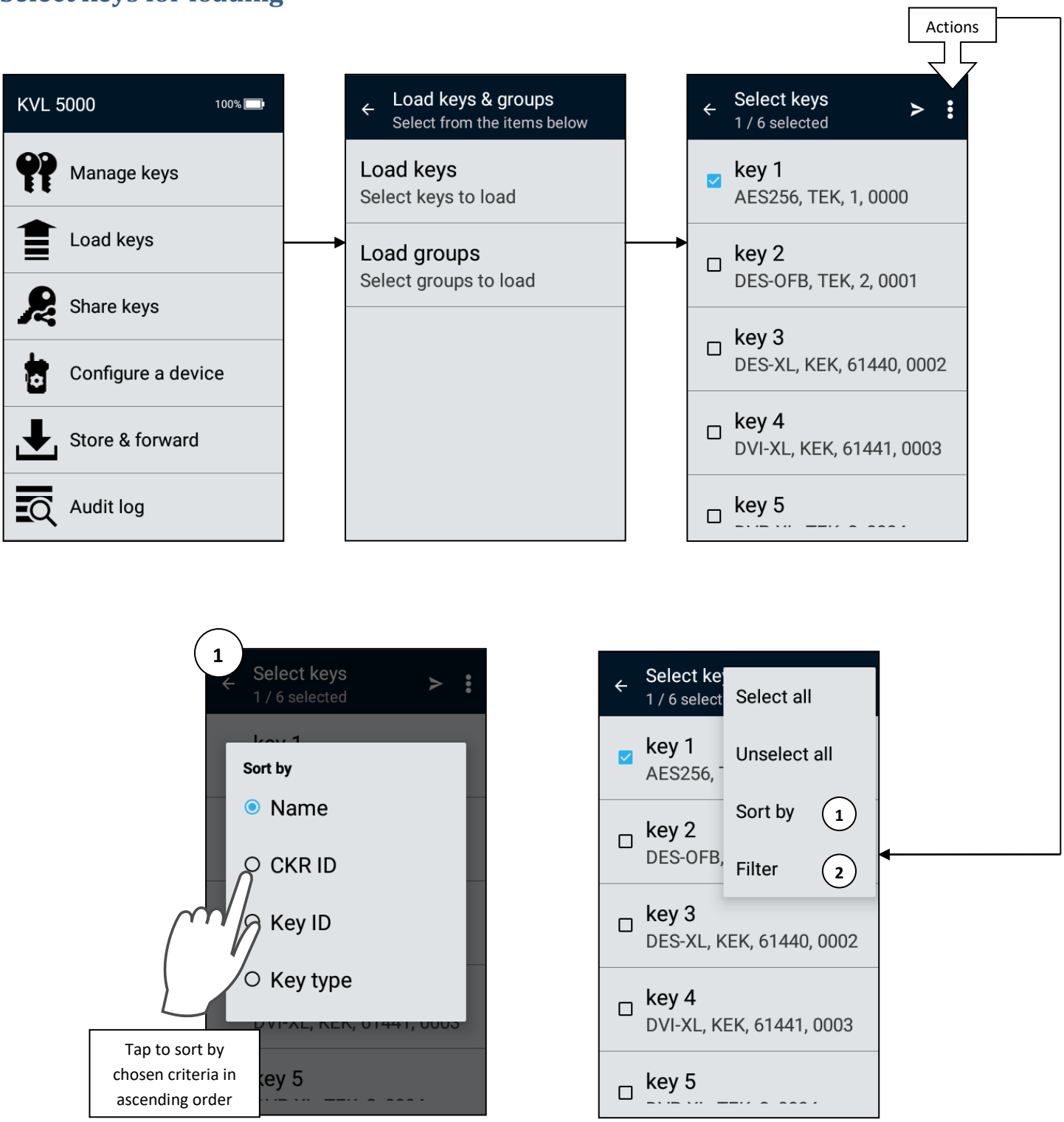


You can also connect devices over USB that support software encryption to perform key load operation when USB key loading feature is enabled.

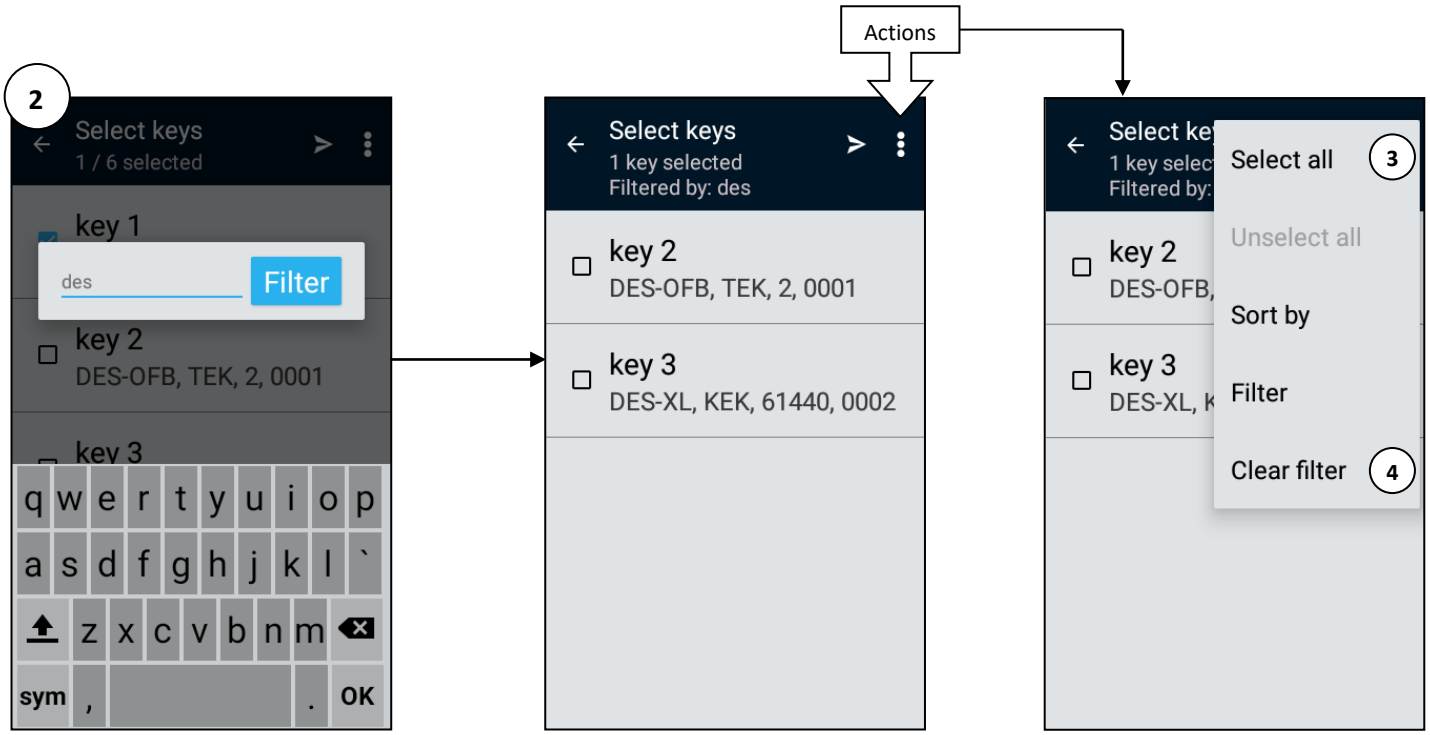
Load Keys

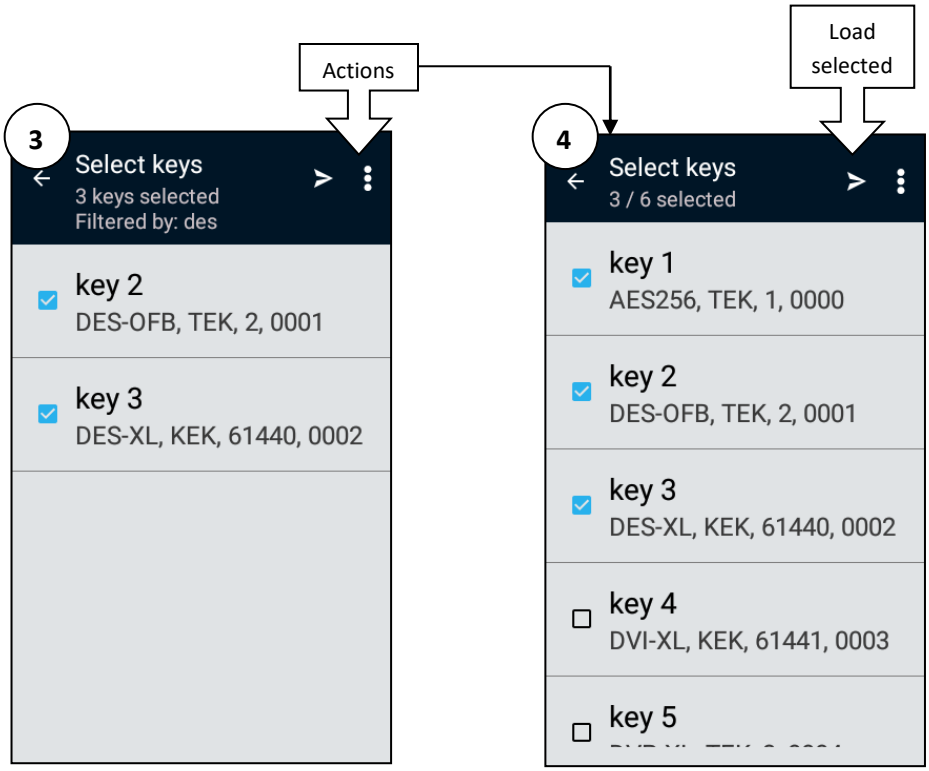
You can also load keys to mobile radios over control head using serial cable. To do that you must first Provision mobile radio with control head keys

Select keys for loading



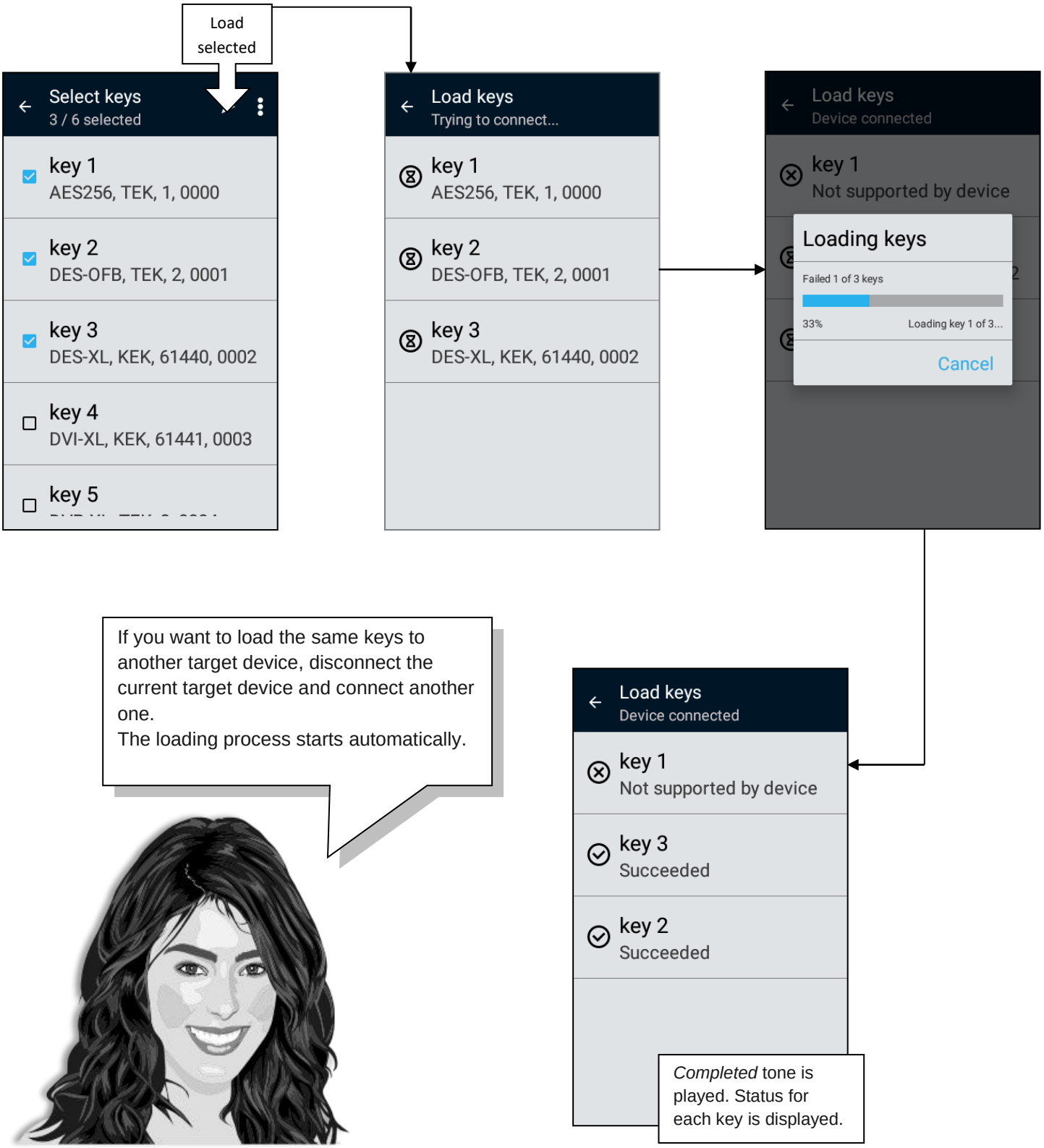
Select keys for loading with filter



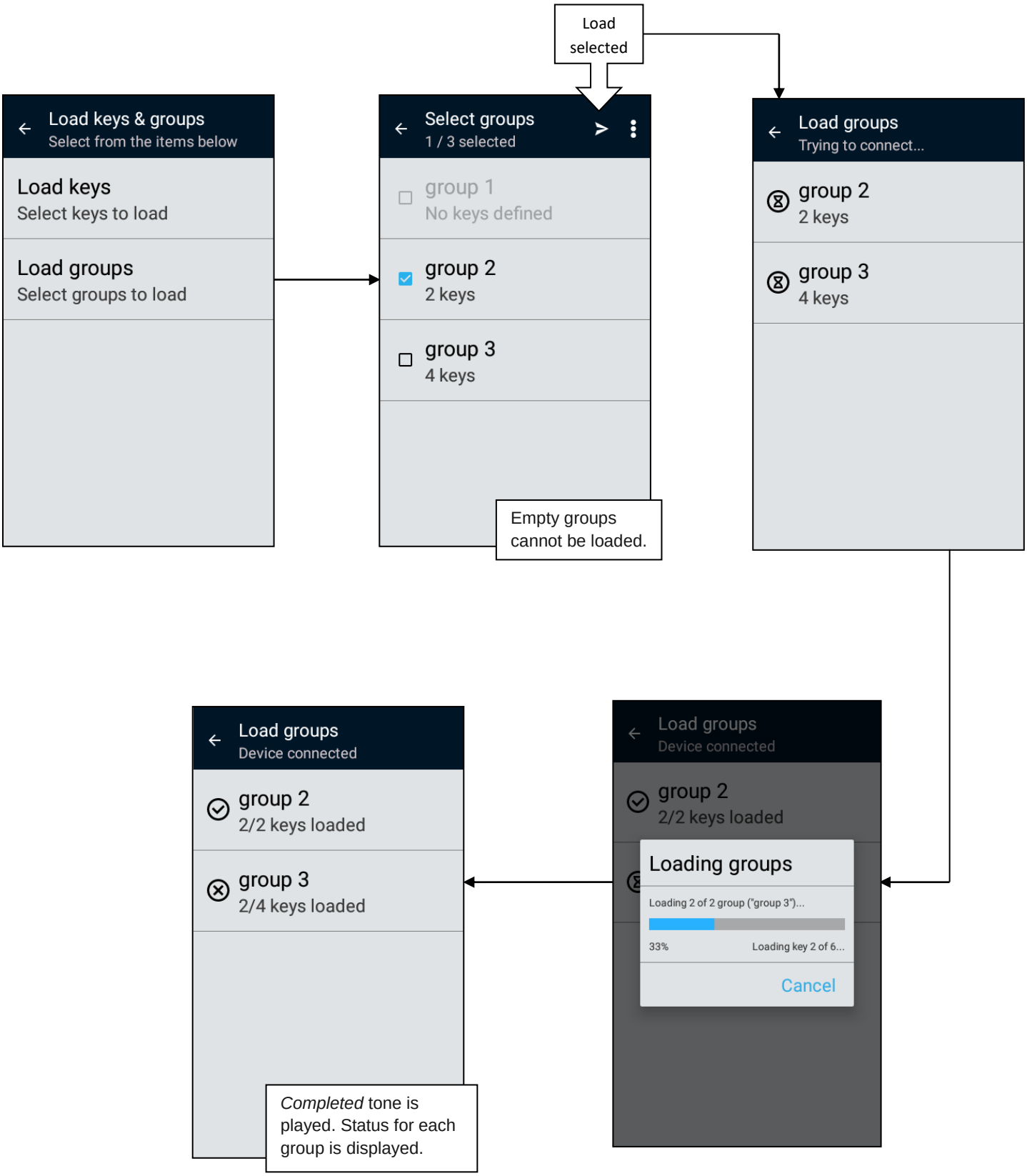


To search for the item type in the name, CKR ID, key type or key ID in the filter dialog.
Options select all and unselect all work only for the filtered items.

Load keys to a target device



Load groups of keys to a target device



Loading Keys Using Push to Load (PTL) Button

You can quickly repeat the last successful keys or key groups loading operation by using the PTL button. PTL button is disabled if any operation is in progress (for example share keys or upgrade).

Press Push to Load button

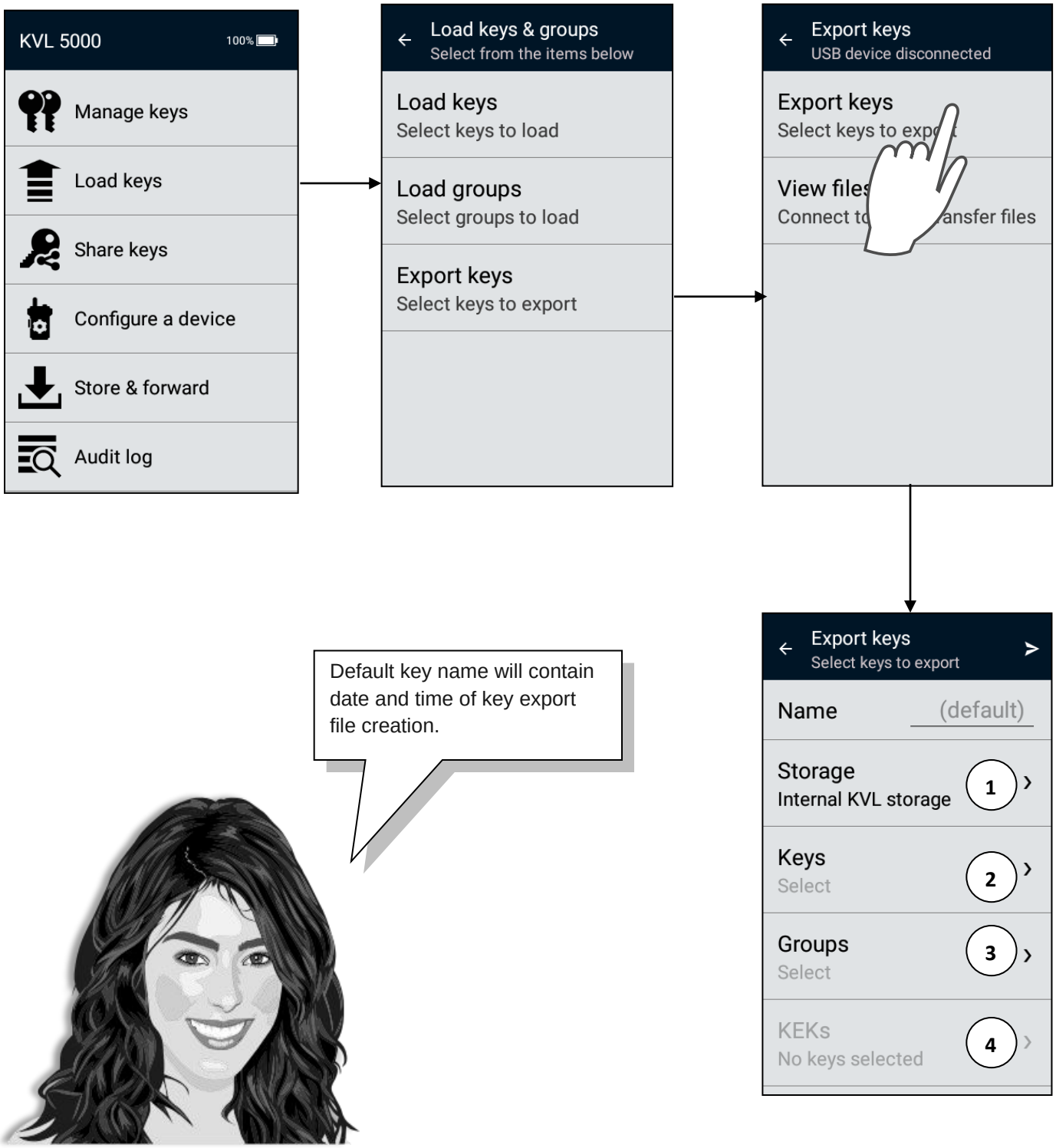
If this is the first time you are loading keys (or previously loaded keys were removed from KVL), push the PTL button and you will be moved to Select keys menu. You can go back to your previous screen by pressing back button.

If you previously loaded keys to a target device, push the PTL button and keys or groups that you loaded previously are immediately loaded into the target device.

You can load auto generated Radio Authentication key to the same radio using PTL button. See Provisioning Radios with Authentication Keys using PTL Button

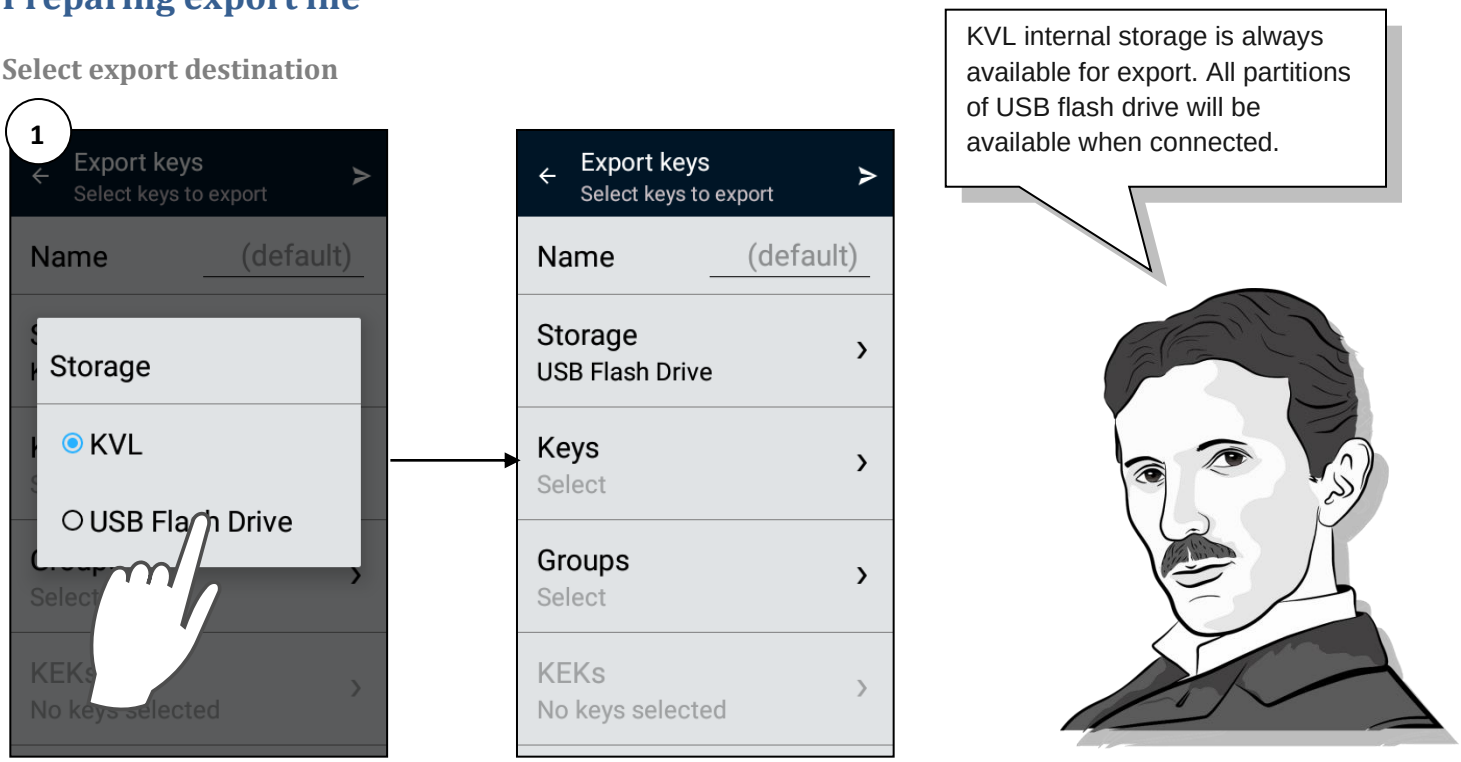
Key File Export

Exporting new file

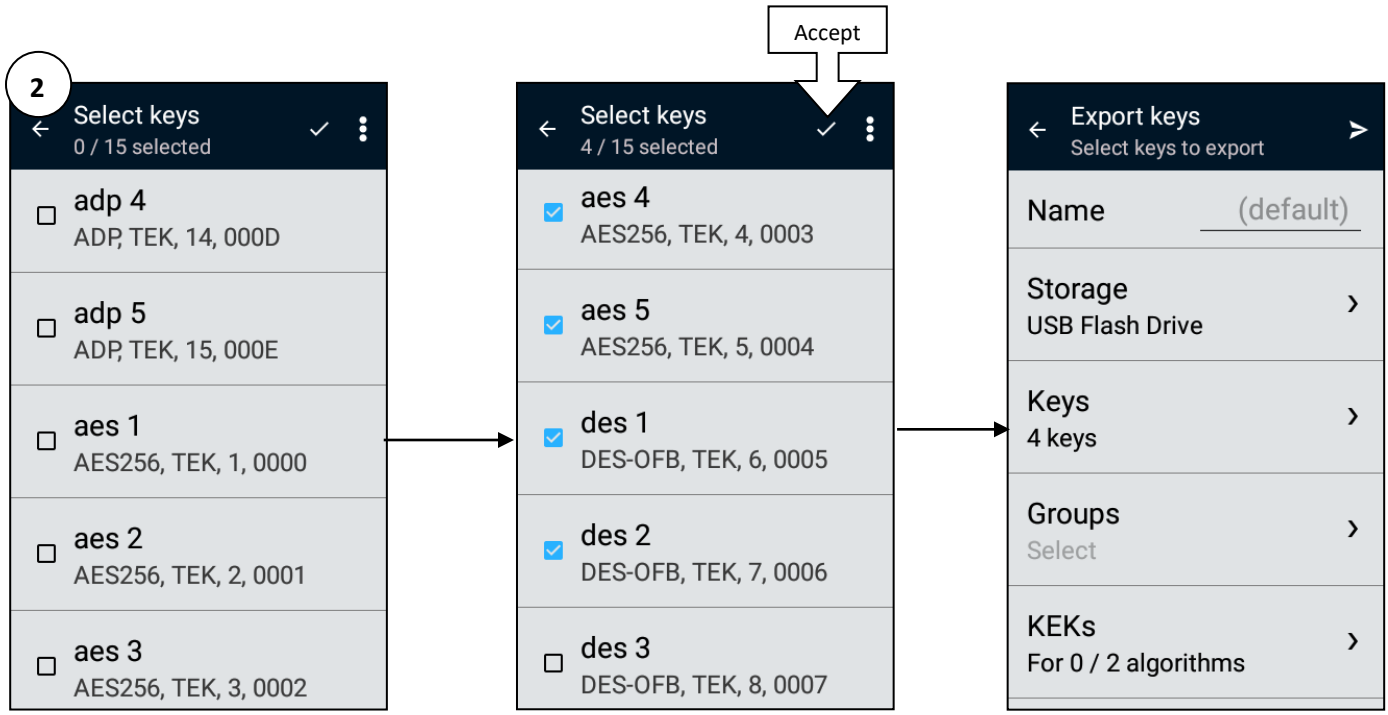


Preparing export file

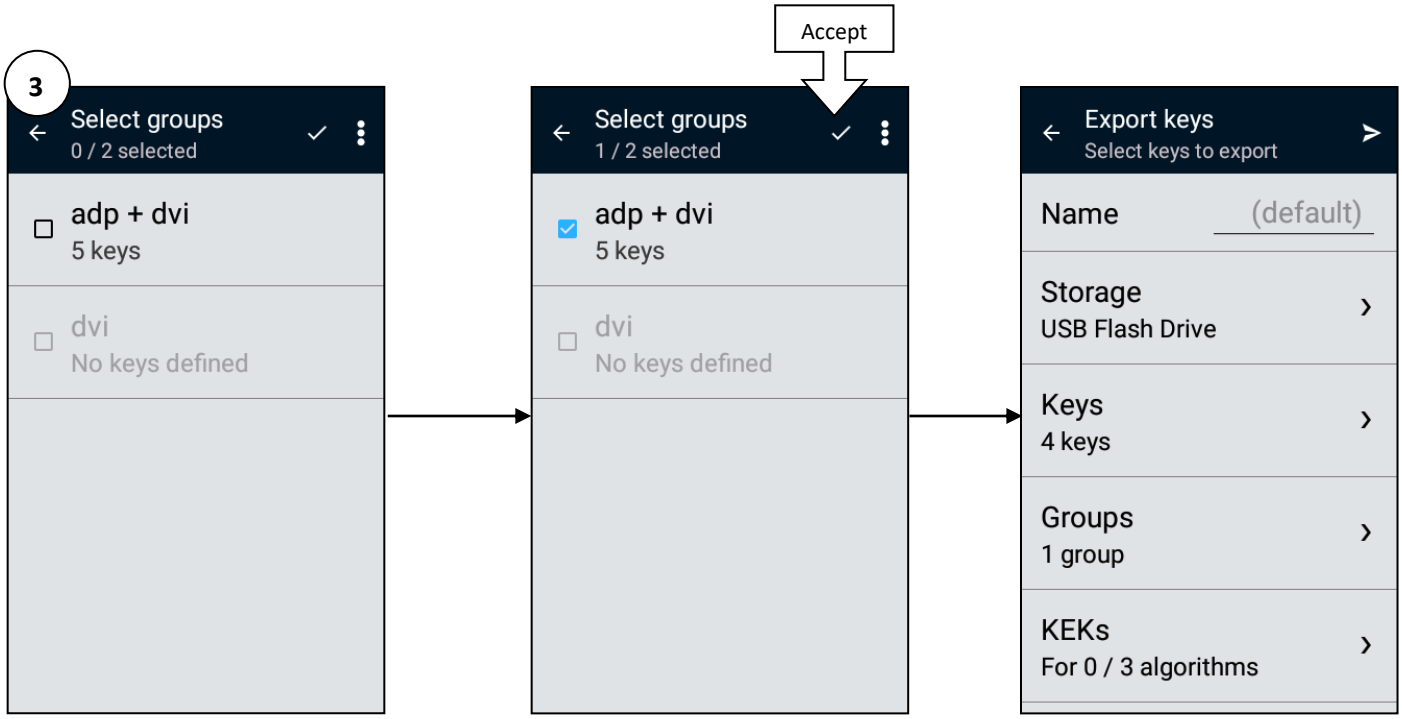
Select export destination



Select keys and groups for export



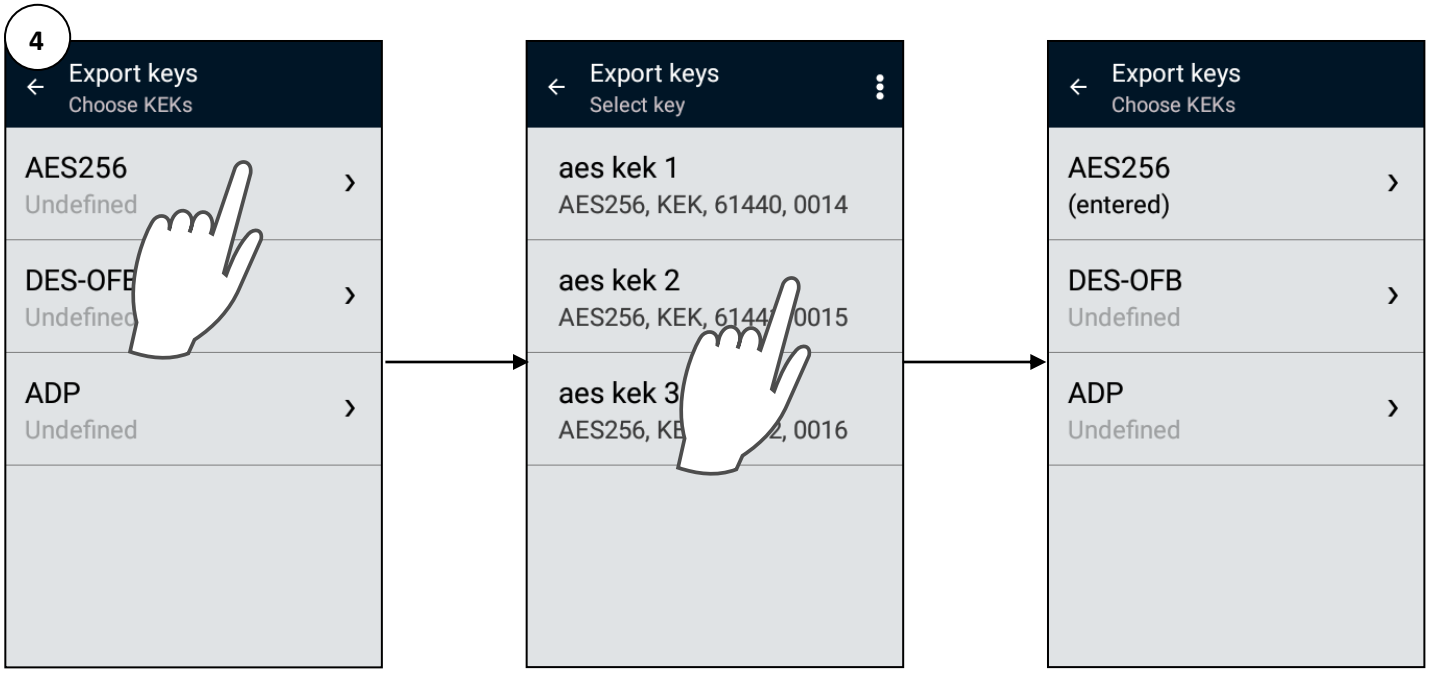
Key File Export

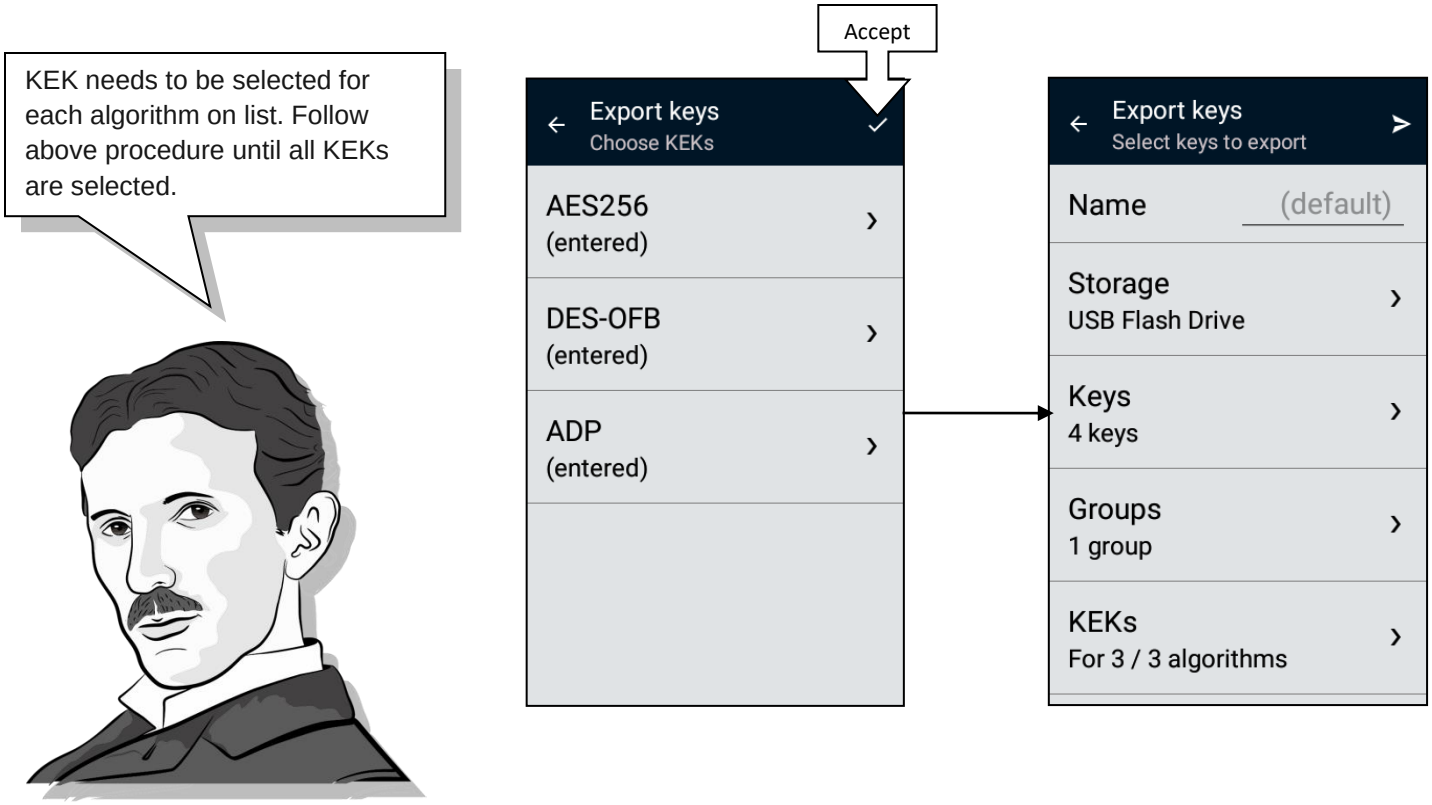


Only keys of algorithms that support key file export (AES256, DES-OFB, ADP) can be selected. Key groups that contain keys of other algorithms can be selected, but only keys of supported algorithms will be exported.

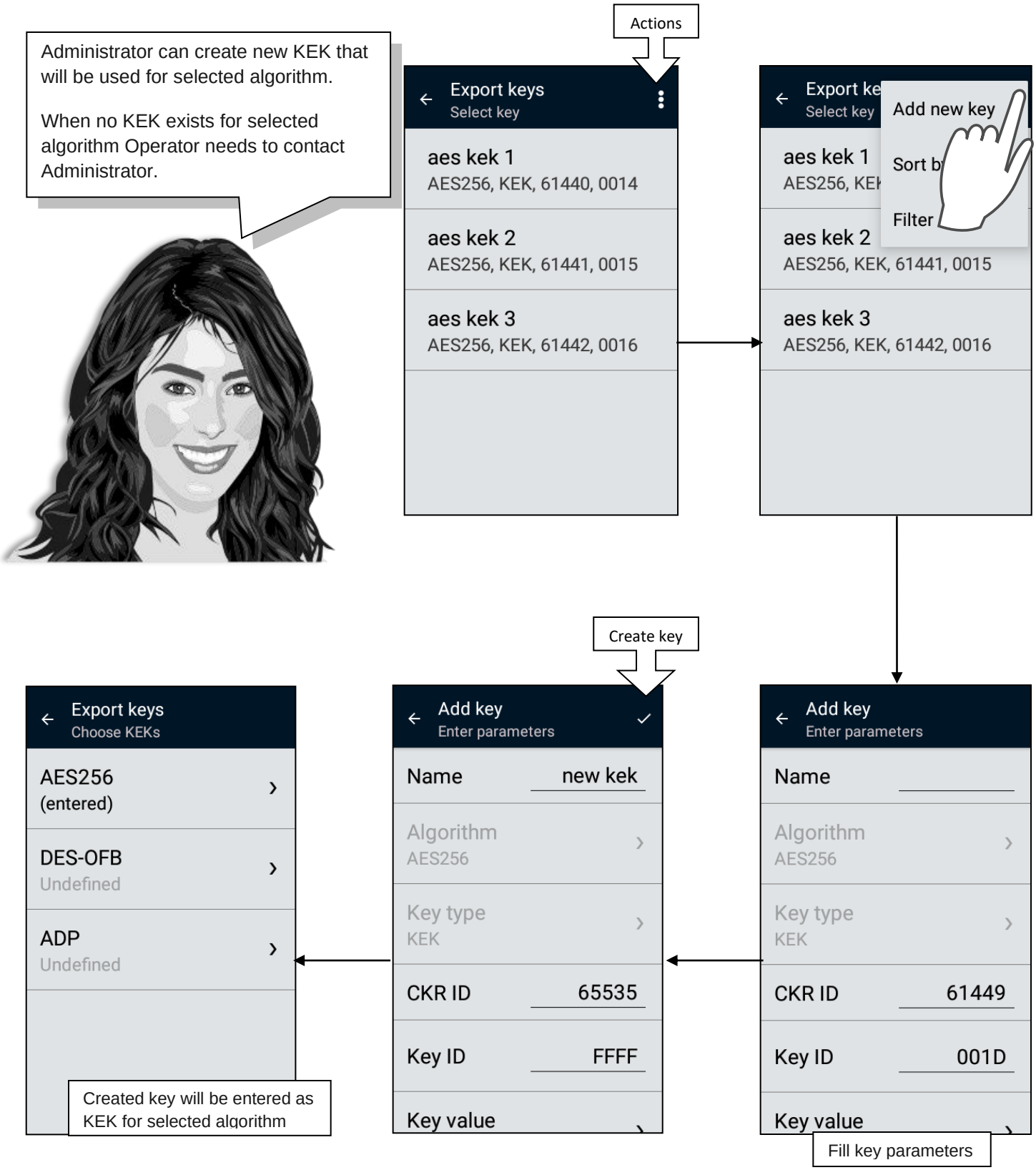
When selecting keys and groups you can use sort and filter options in same way like in Load Keys.

Select KEKs for key export algorithms

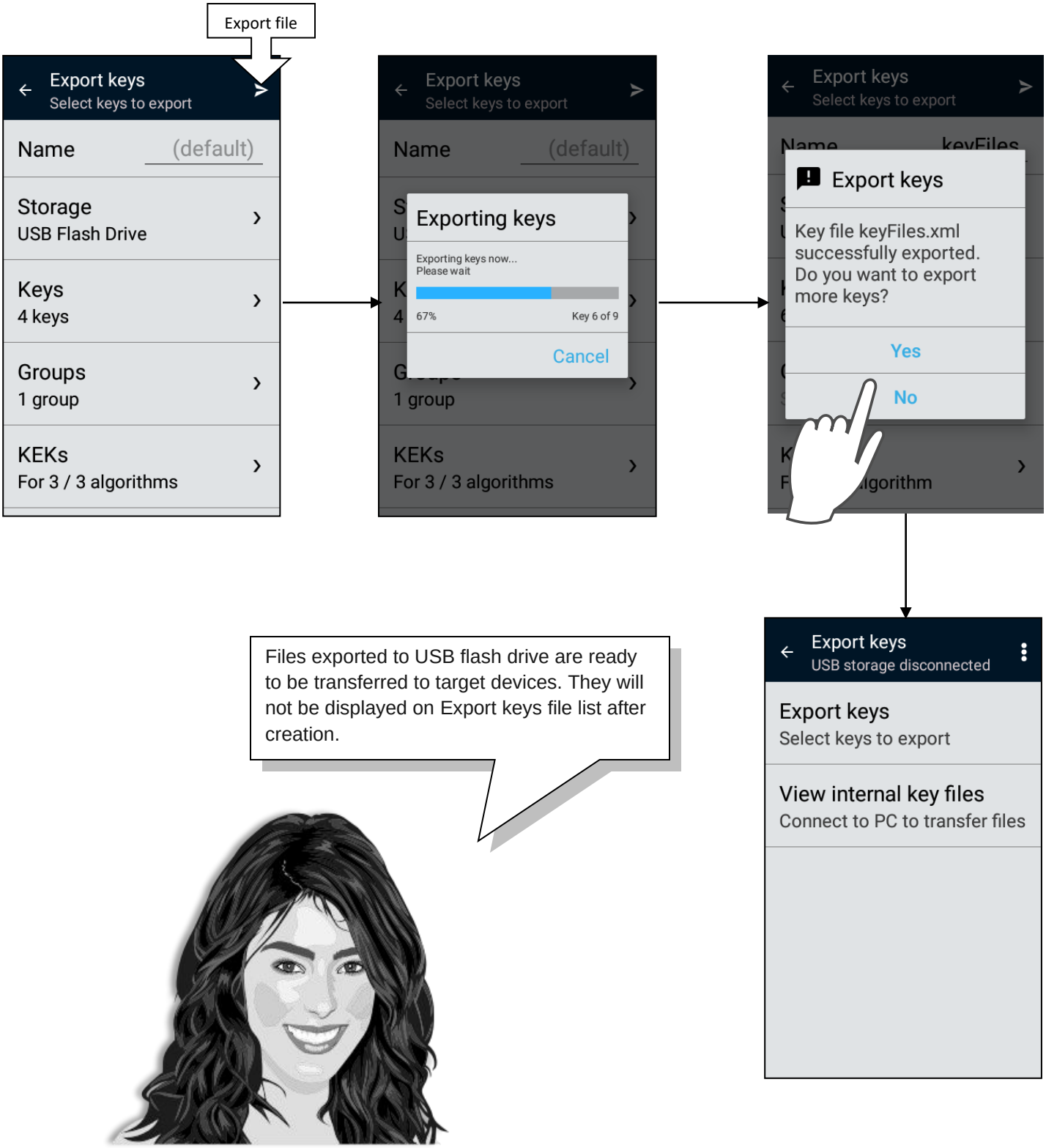




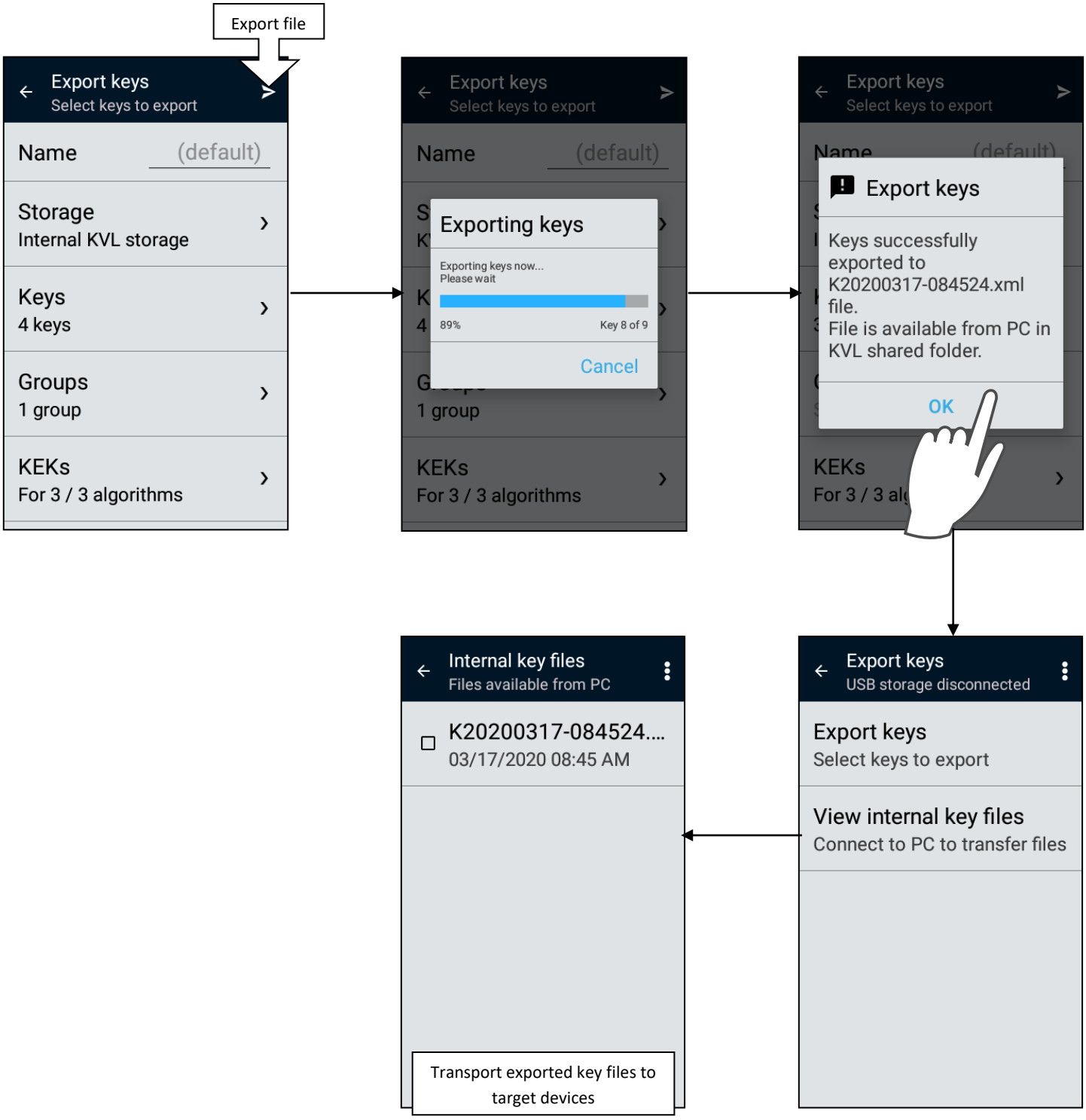
Key File Export



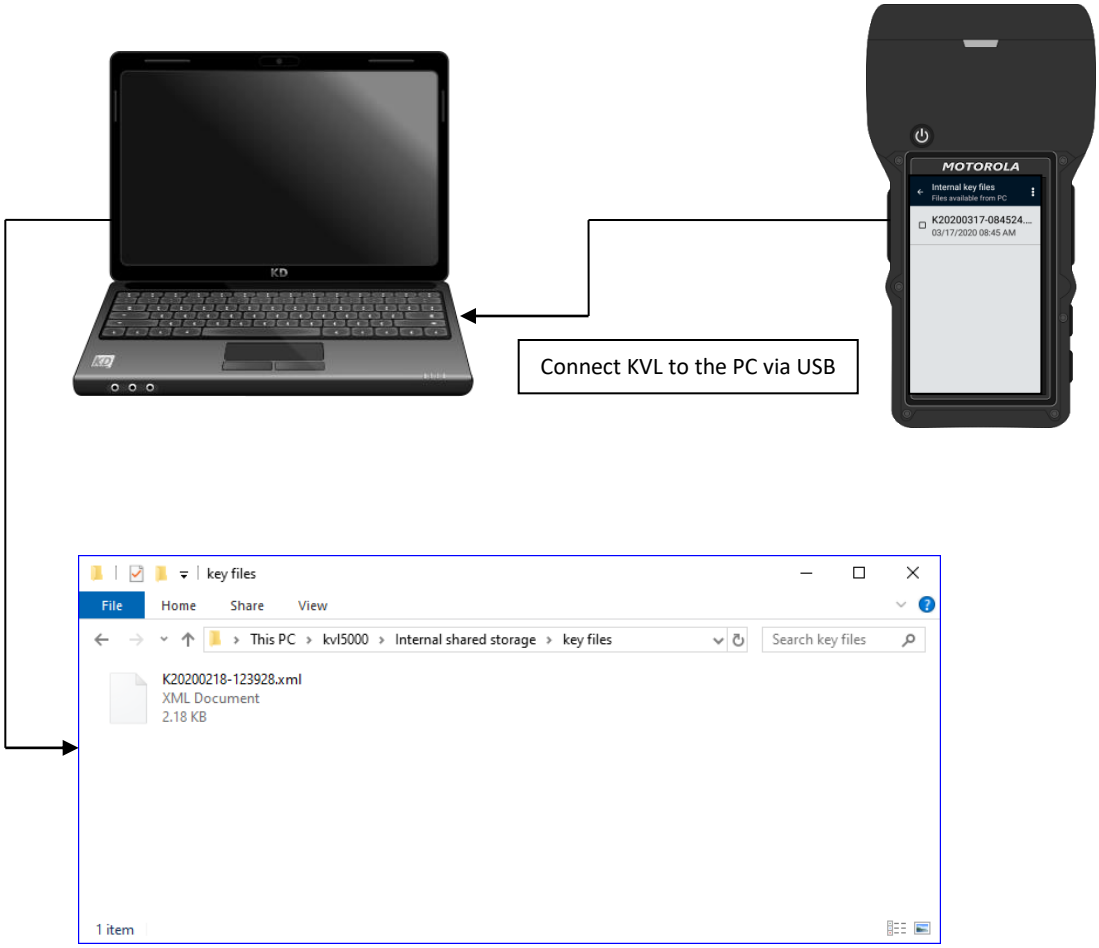
Generating export file to USB flash drive



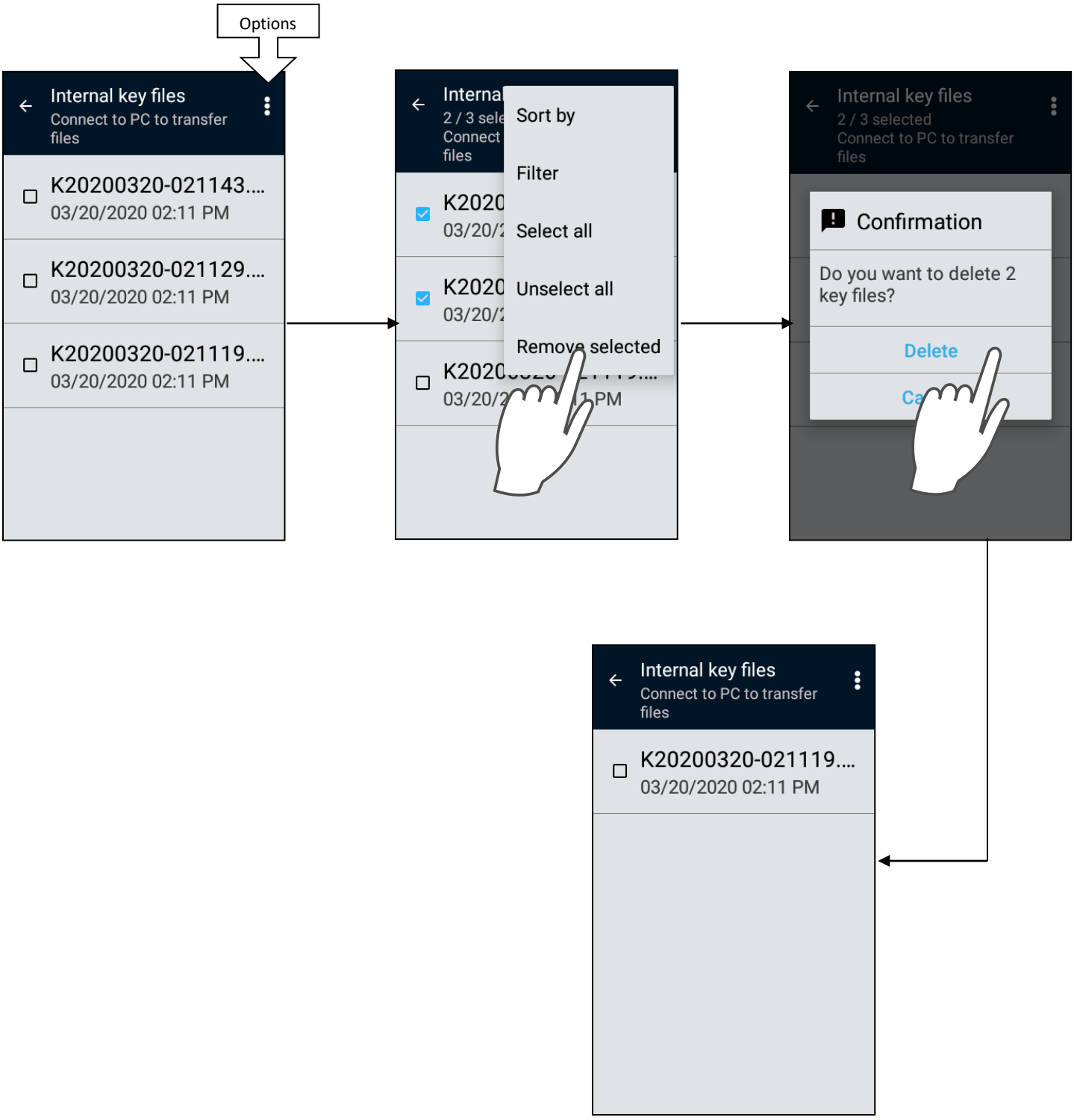
Generating export file to KVL internal storage



Connecting KVL to PC to transfer key export files



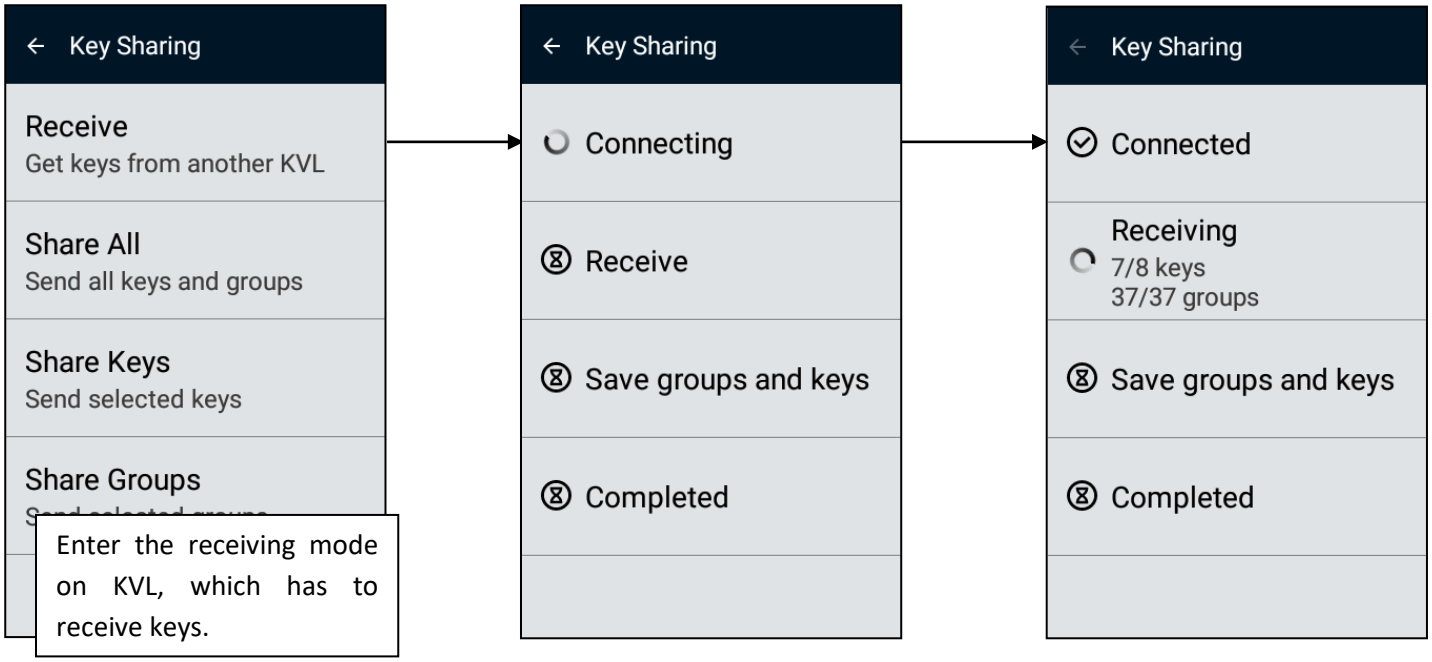
Removing export files from KVL internal storage

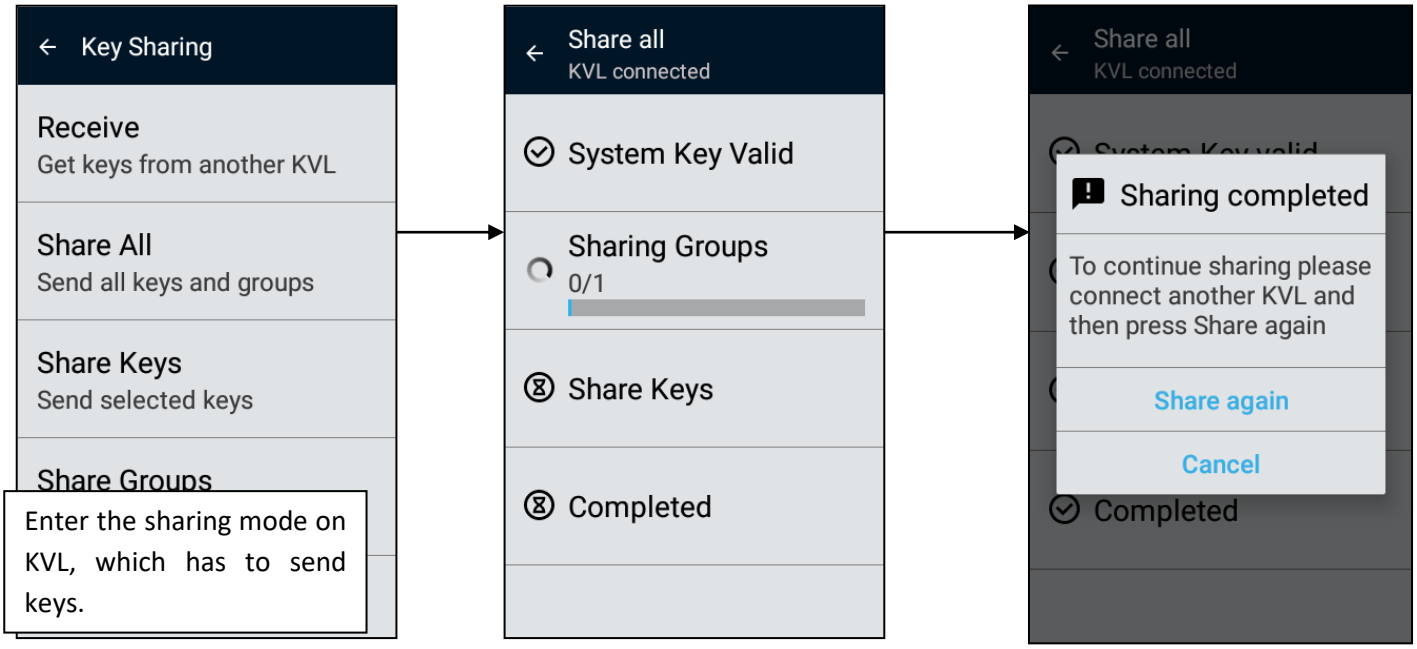


Connecting devices

Sharing operation is done between two KVLs connected via MX Port.

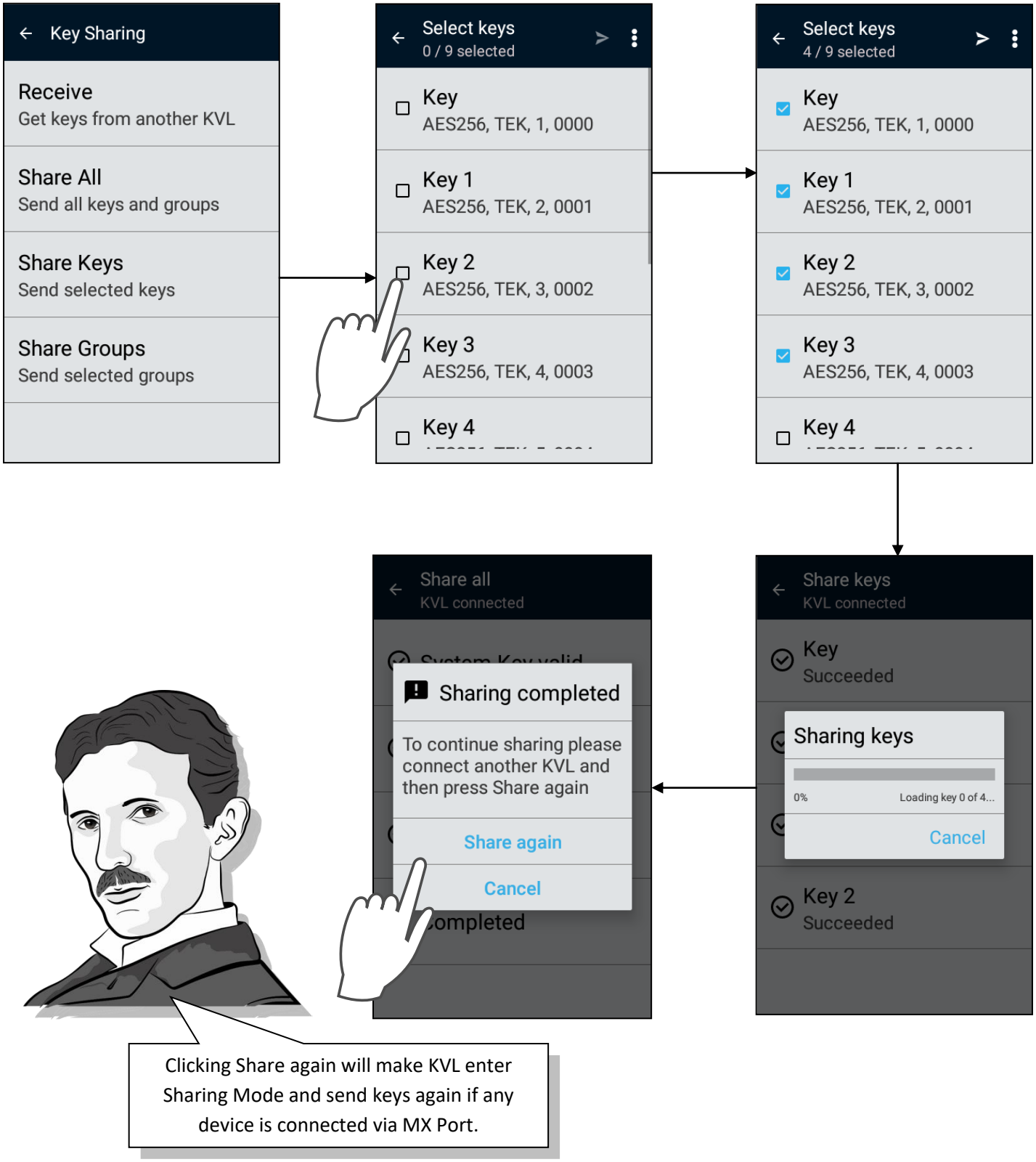
Sharing between two KVL5000s





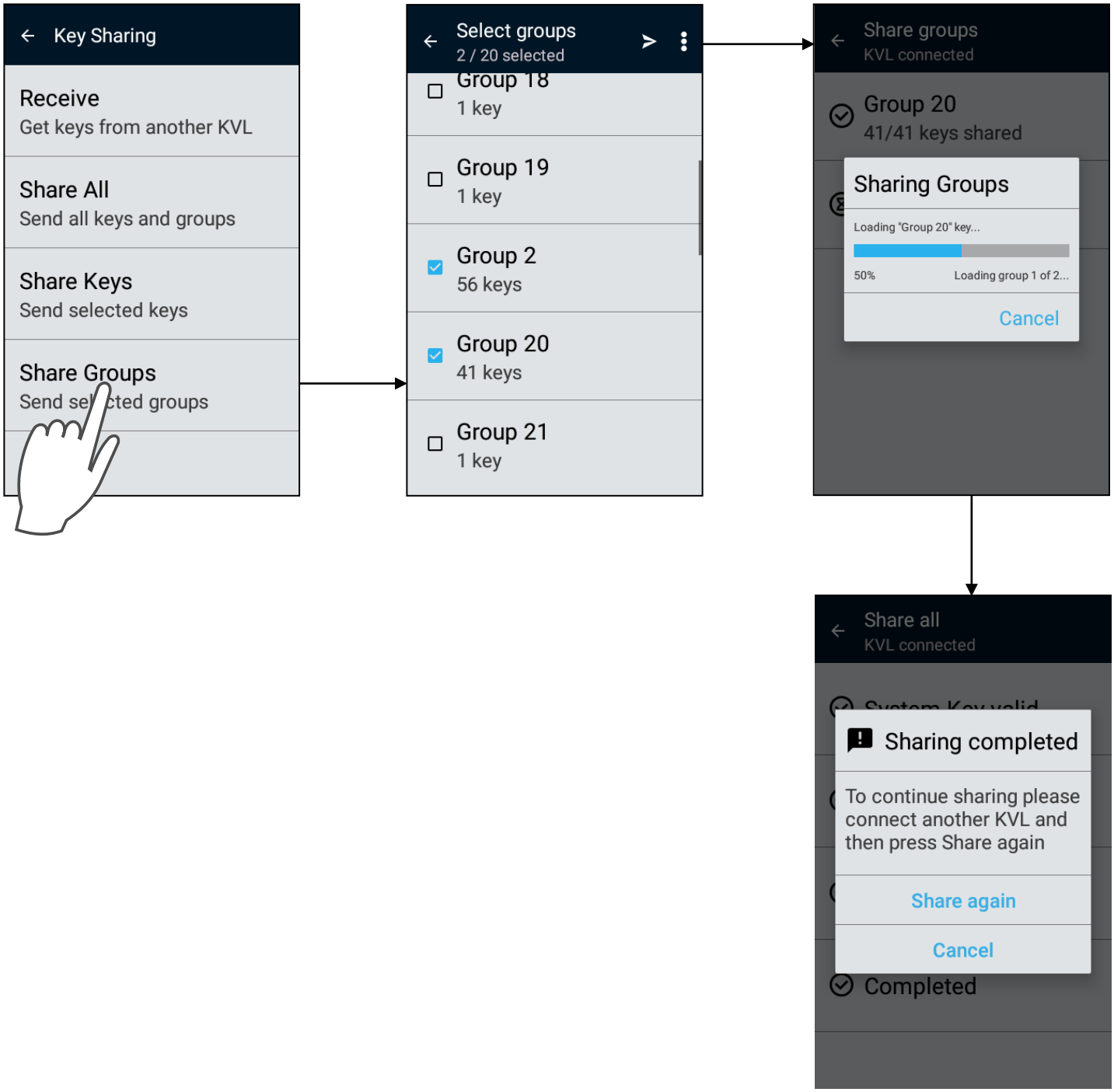
When sharing is completed, you can connect another KVL and continue sharing by pressing Share again or you can finish by pressing Cancel

Sharing selected keys

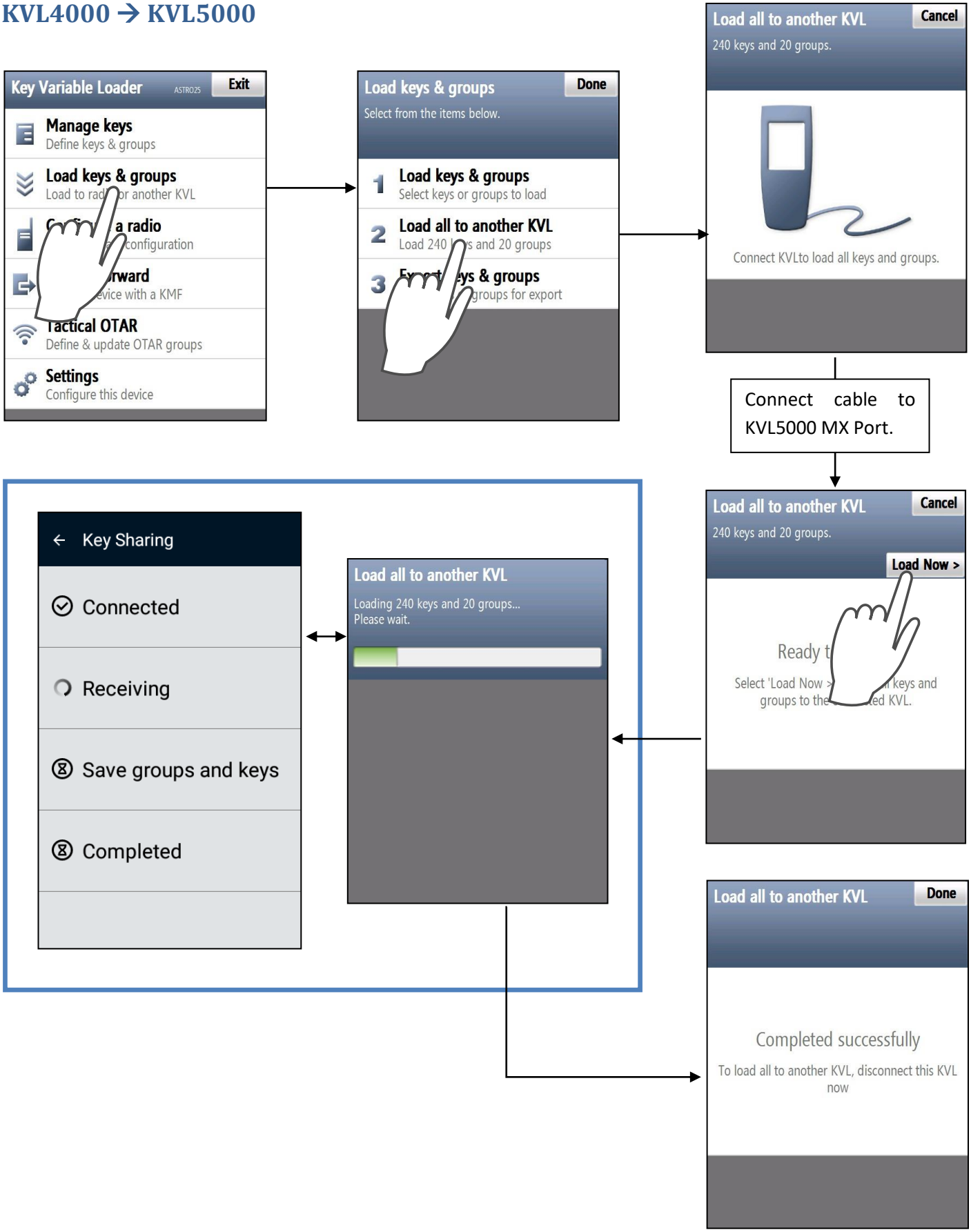


Sharing selected groups

Sharing selected groups share those groups as well as all keys which belong to them.



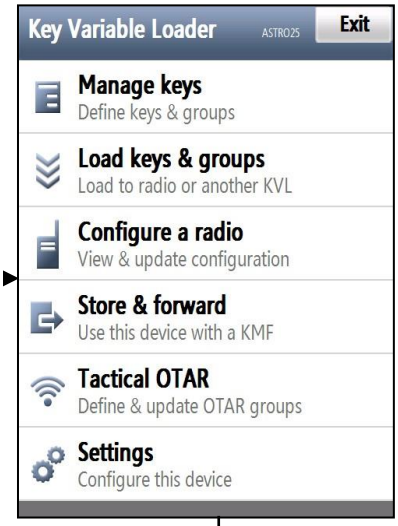
KVL4000 → KVL5000



KVL5000 → KVL4000

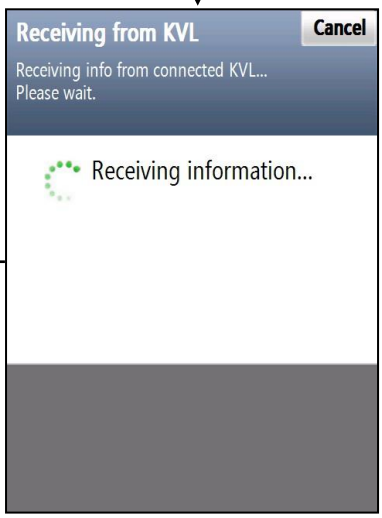
KVL4000 should stay in Main Menu while connecting another KVL.

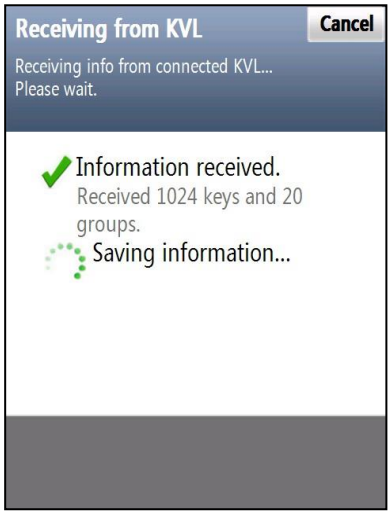
Connect KVL4000 with MX cable.

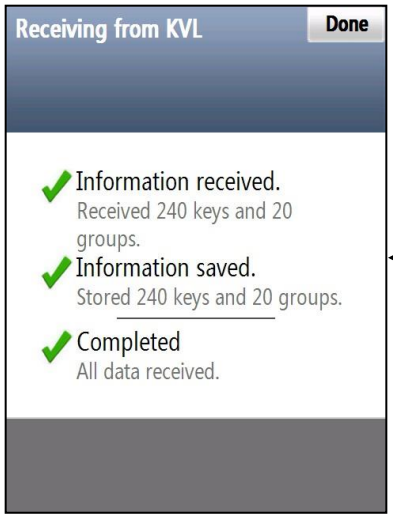


On KVL5000 enter sharing mode:
Share All / Share Keys / Share Groups

After connection is detected KVL5000 starts sharing and KVL4000 starts receiving.



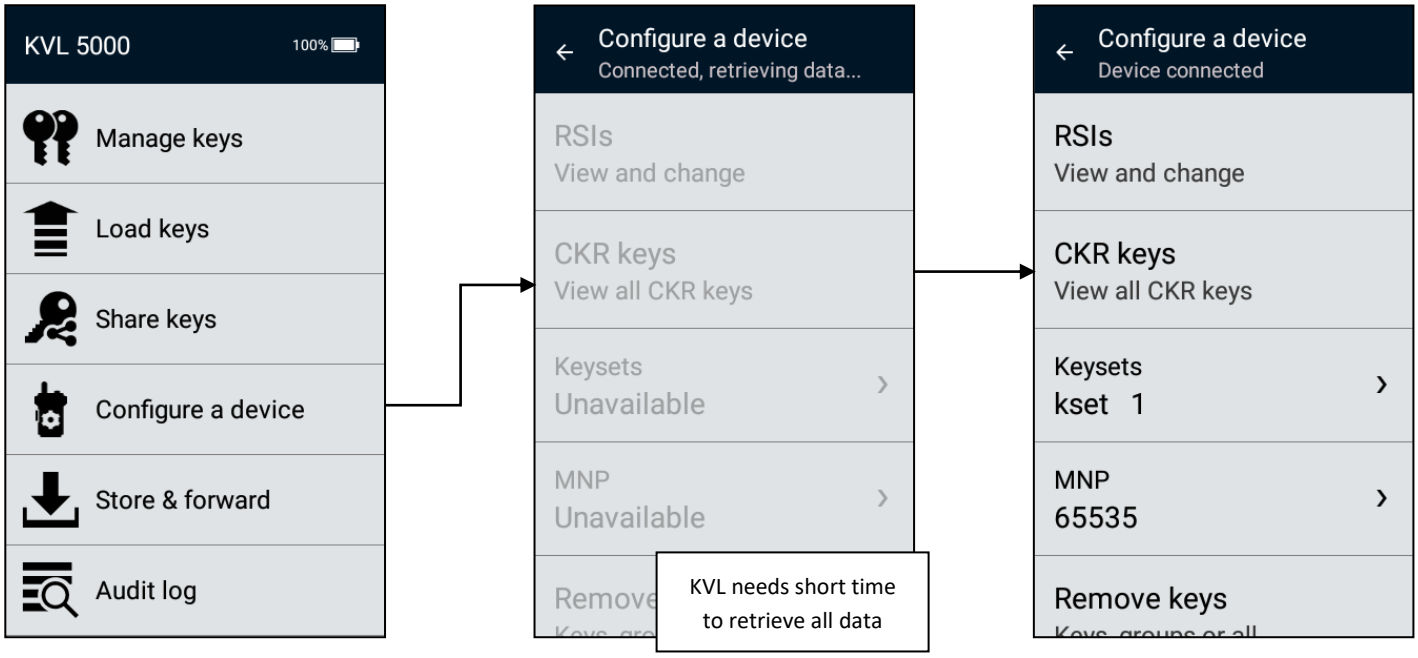


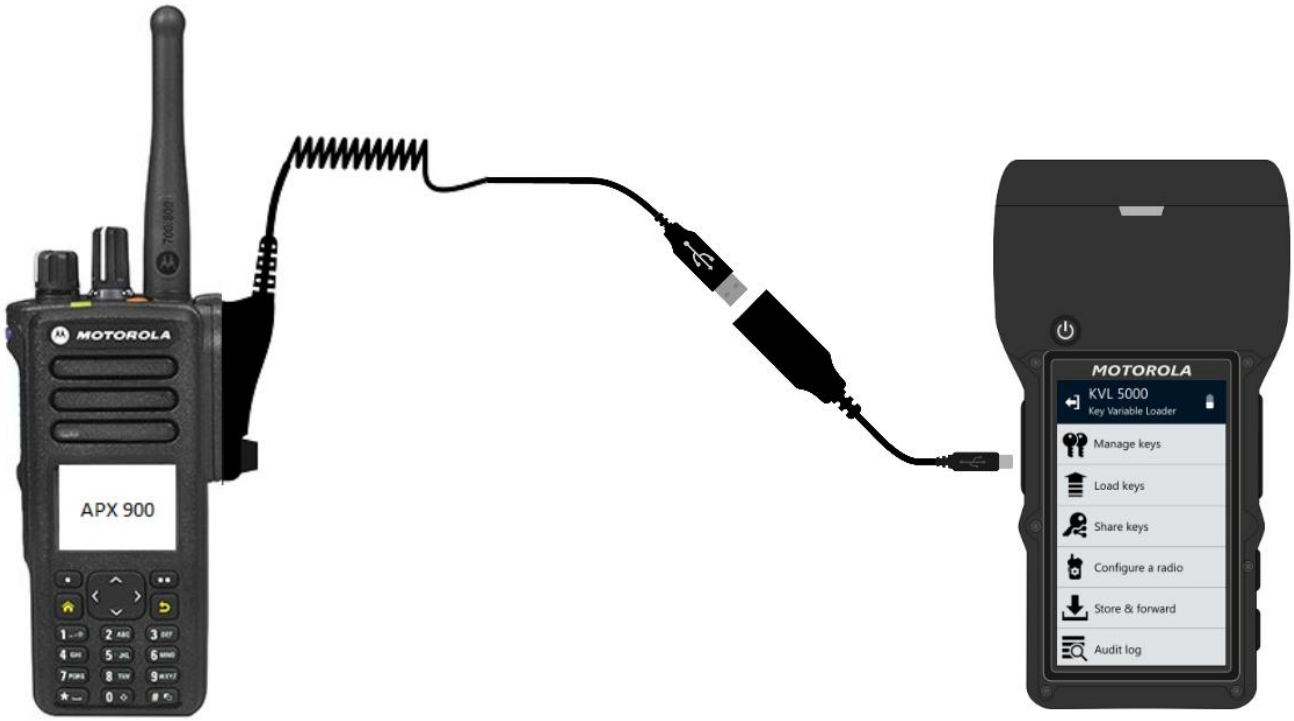


After sharing is done, disconnect MX cable.

You may connect another KVL to receive the same set of keys and/or groups.

Connect a device to KVL

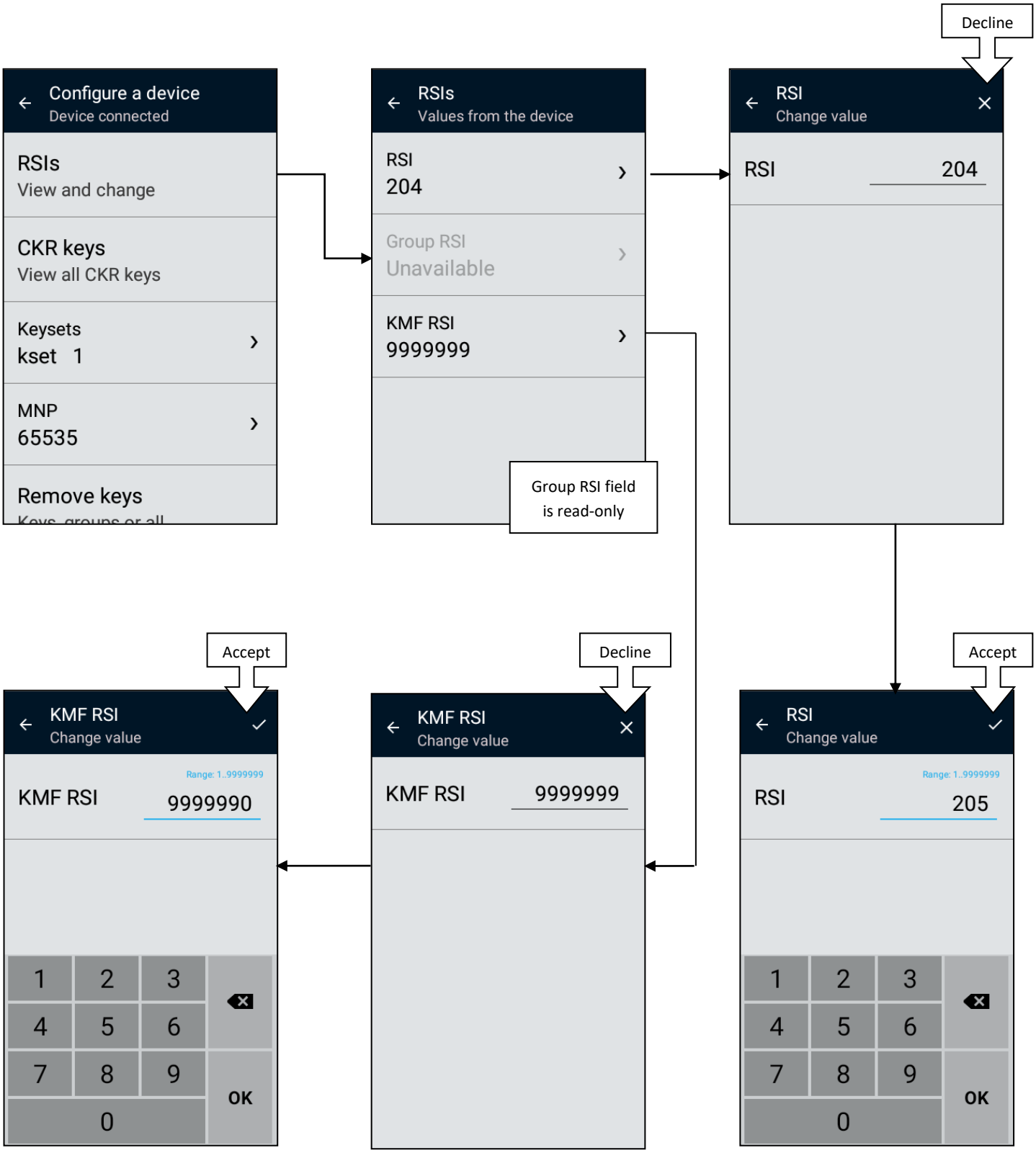




You can also connect devices over USB that support software encryption to perform key load operation when USB key loading feature is enabled.

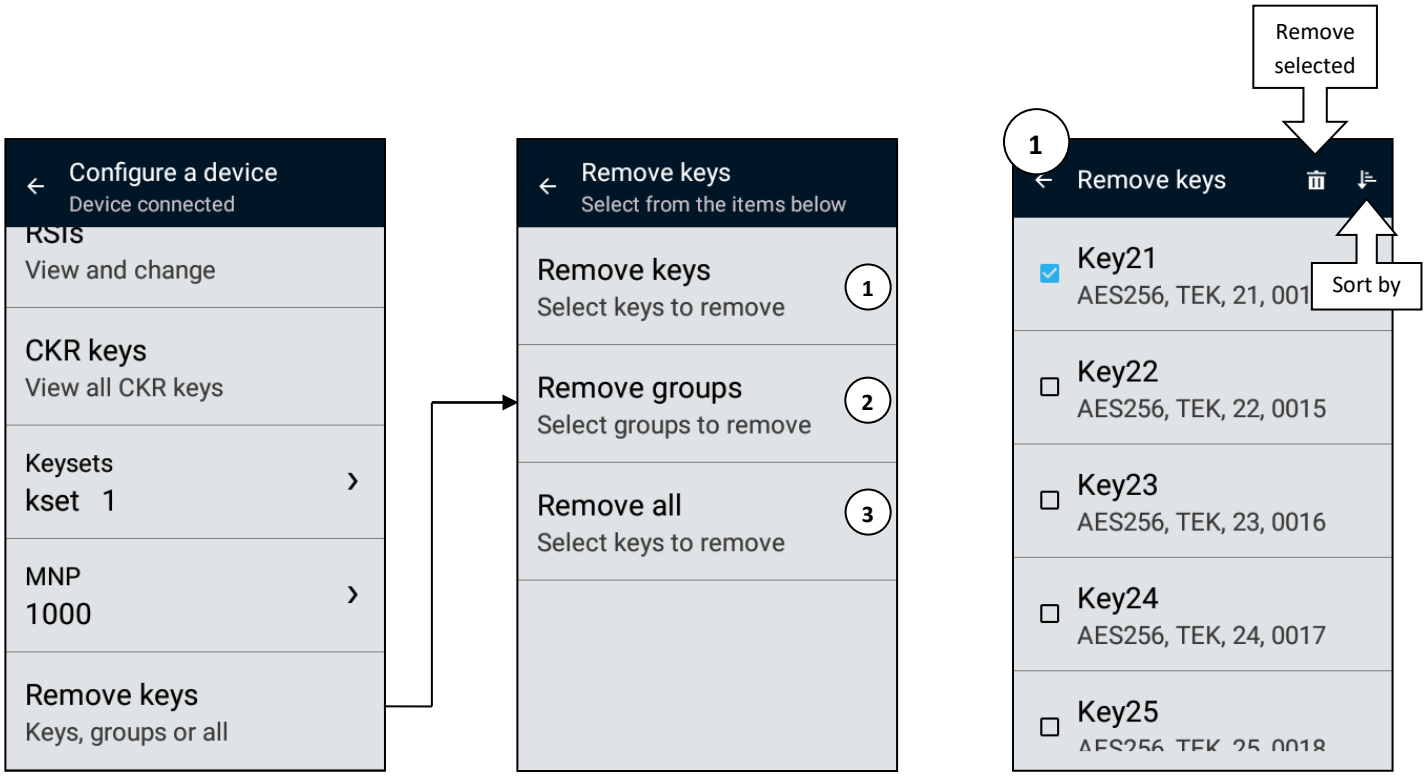
You can also configure mobile radio over control head using serial cable. To do that you must first Provision mobile radio with control head keys

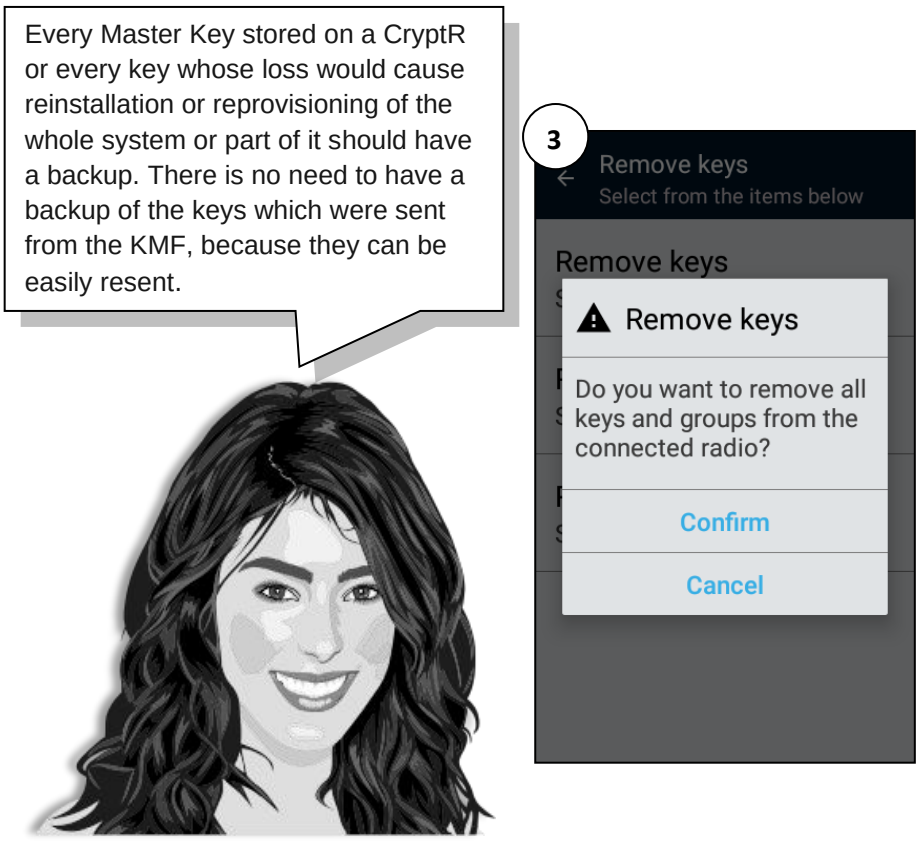
Change RSIs

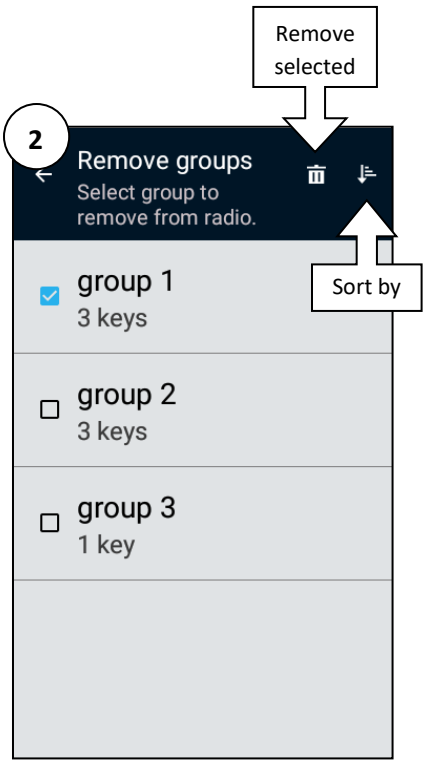

Decline
Configure a device
Device connected
RSIs
View and change
CKR keys
View all CKR keys
Keysets
kset 1
MNP
65535
Remove keys
RSIs
Values from the device
RSI
204
Group RSI
Unavailable
KMF RSI
9999999
Group RSI field is read-only
RSI
Change value
RSI
204
Accept
Decline
Accept
KMF RSI
Change value
Range: 1..9999999
KMF RSI
9999990
KMF RSI
Change value
KMF RSI
9999999
RSI
Change value
Range: 1..9999999
RSI
205
1 2 3 4 5 6 7 8 9 0
OK

Other settings

Remove keys from a device

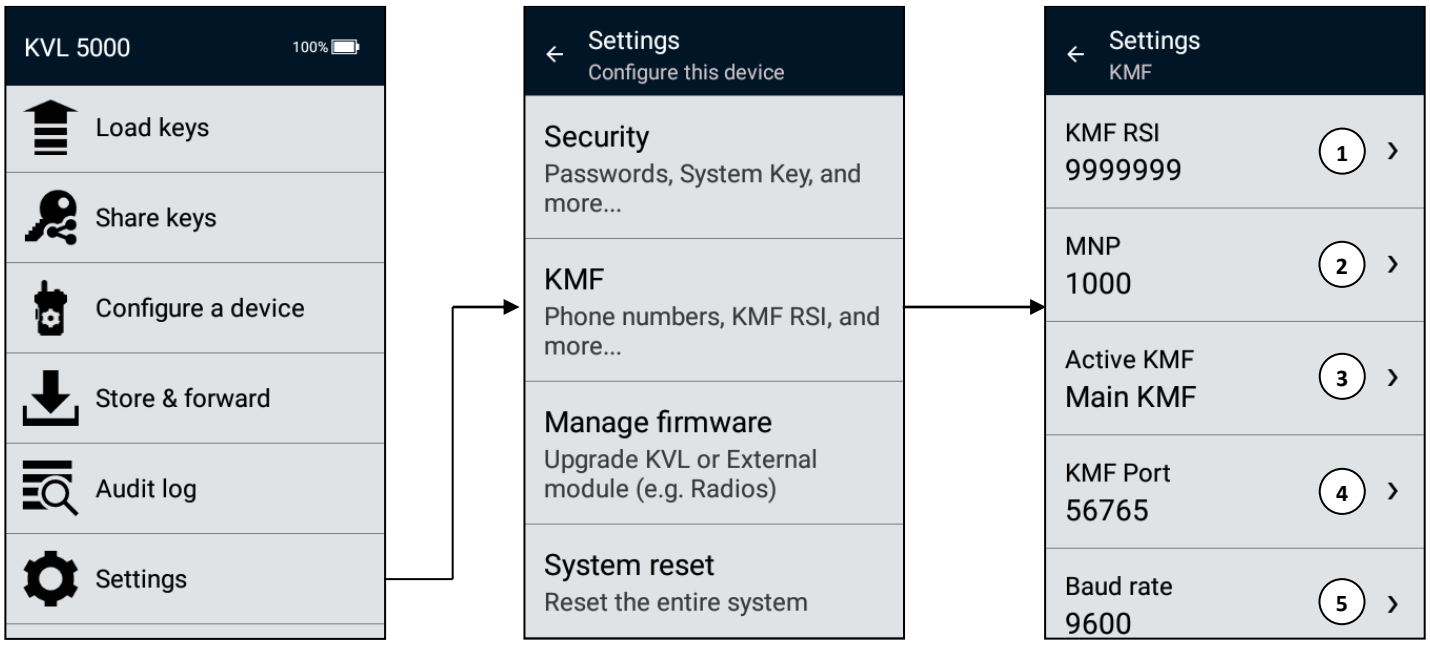


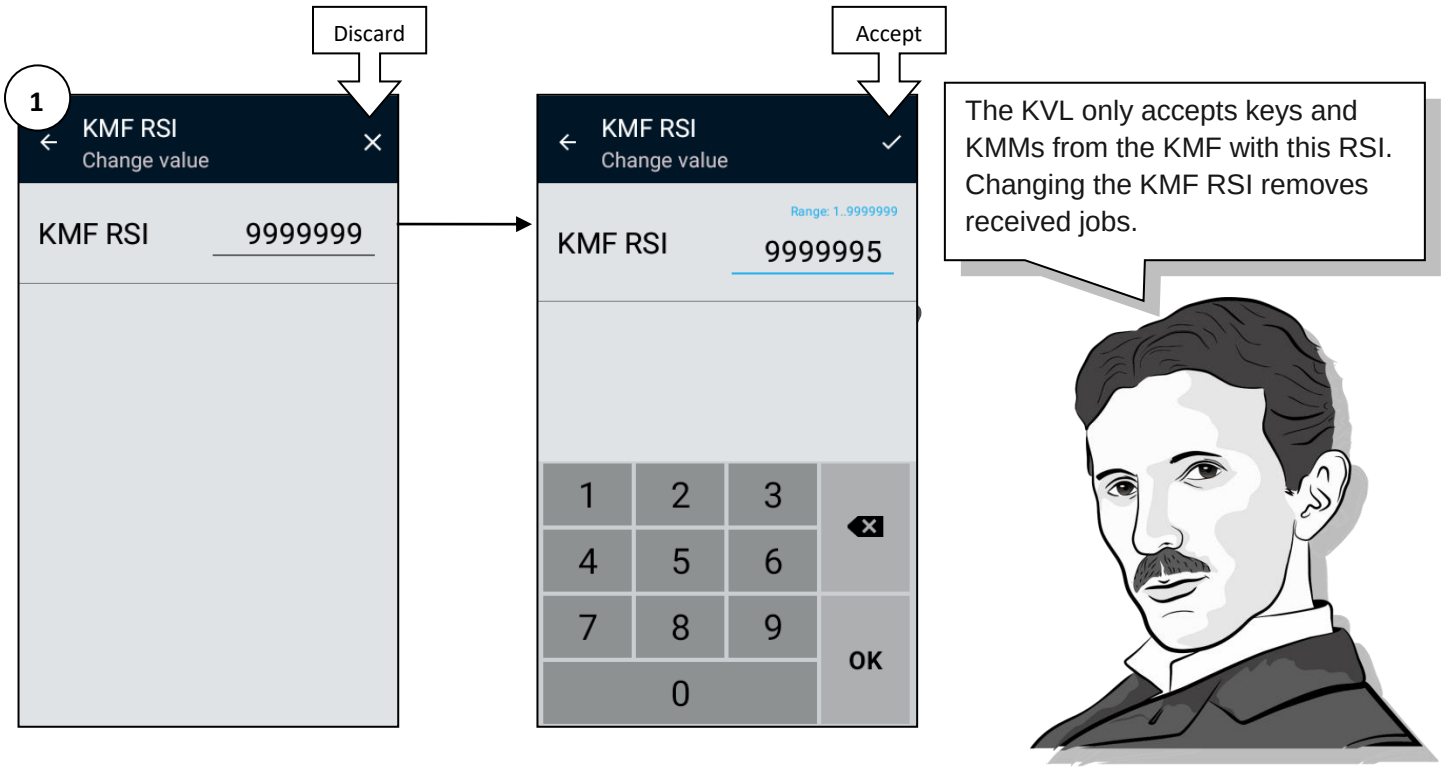




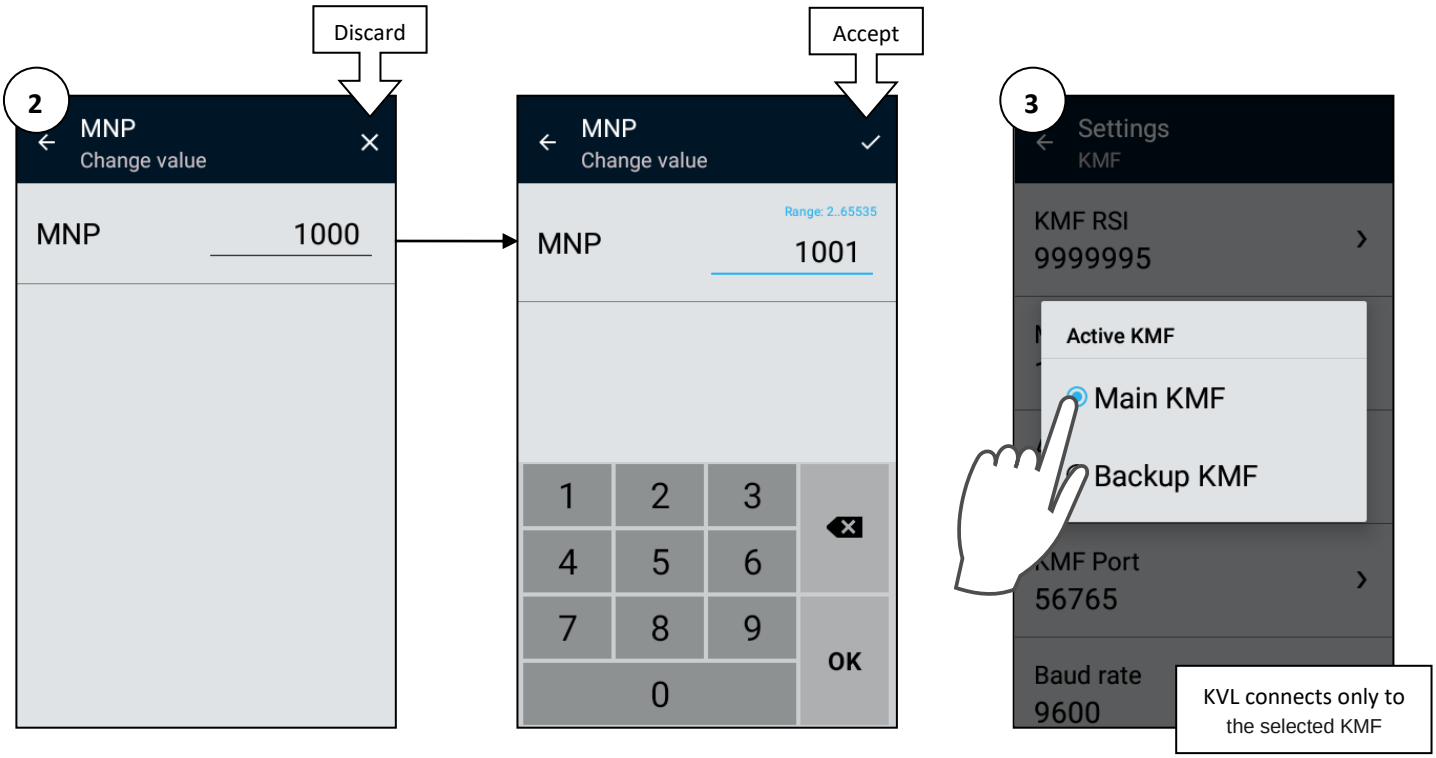
KMF Settings (1)

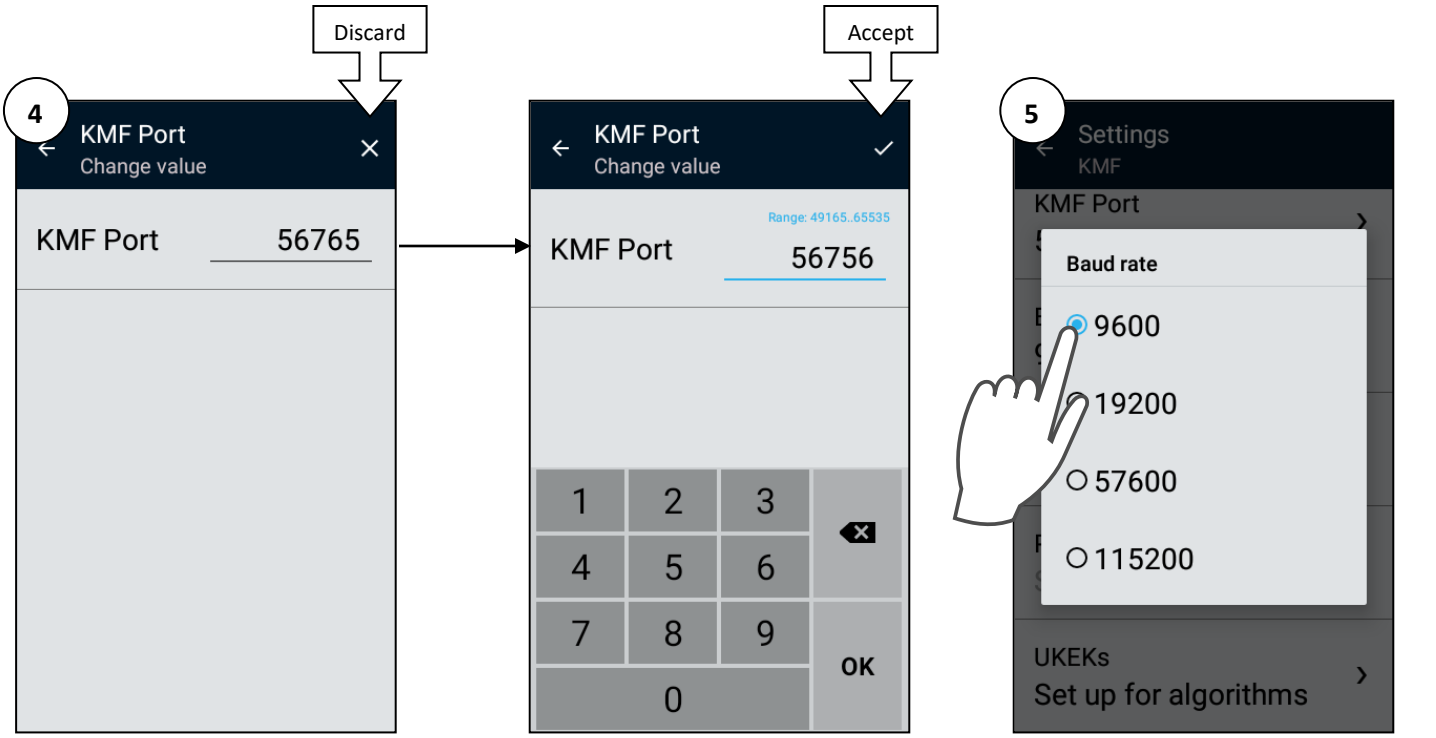
Before using your KVL to work with a KMF, you need to program several KMF related parameters.



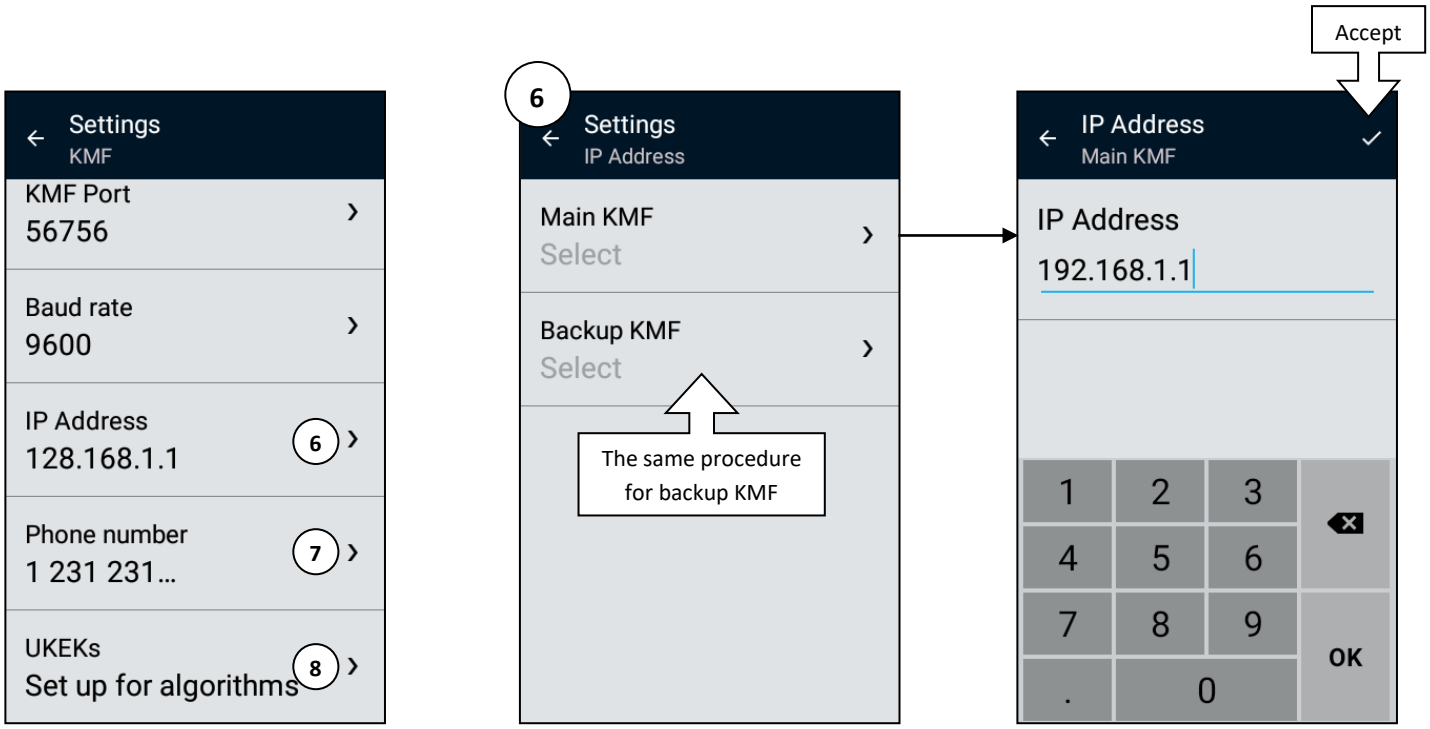


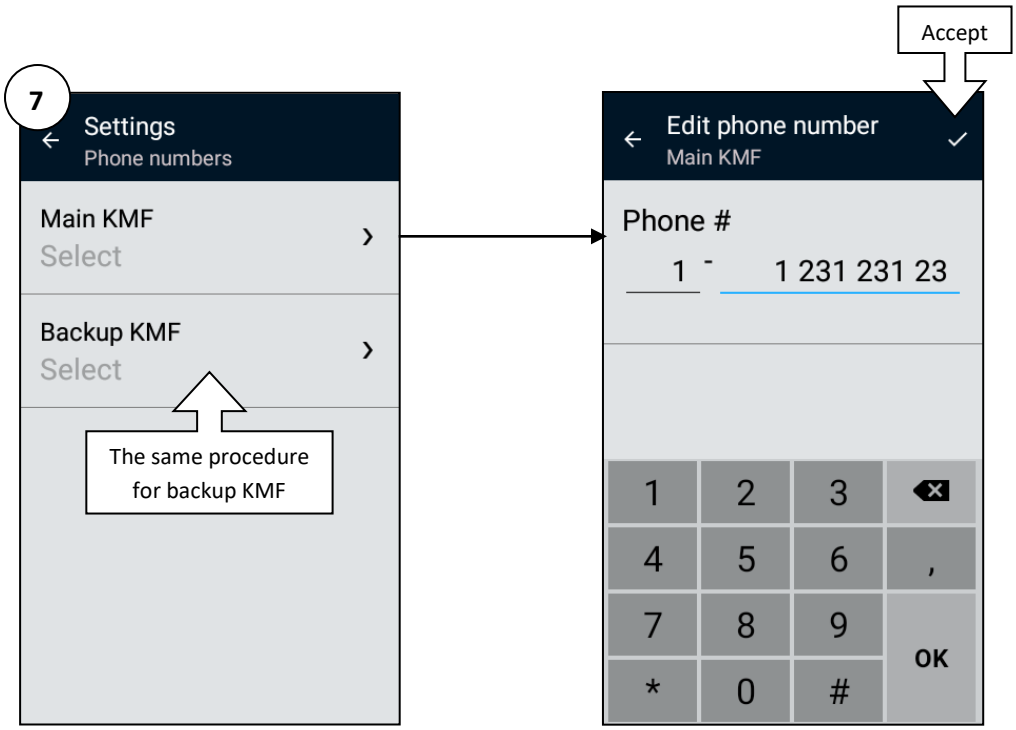
KMF Settings (2)



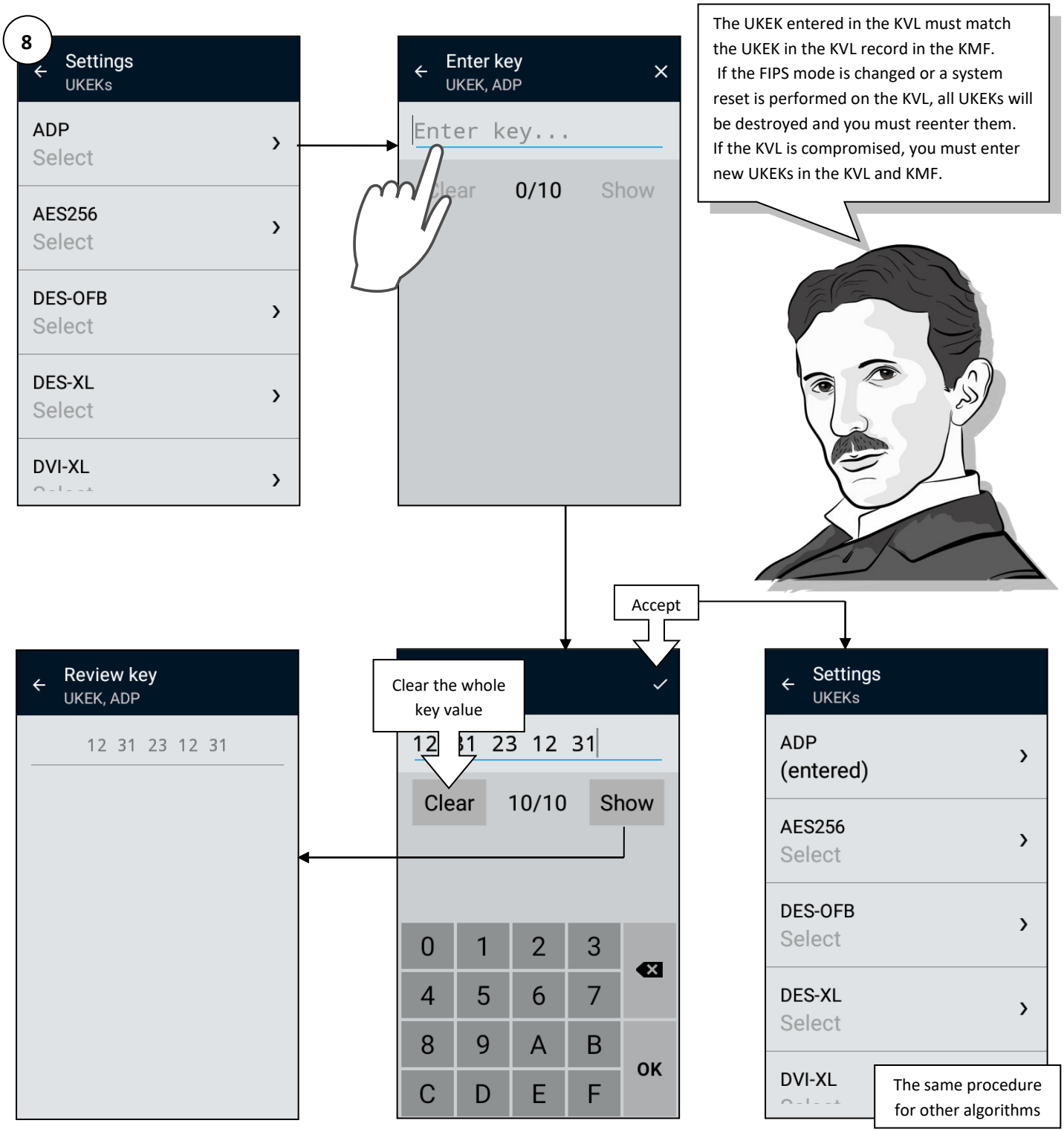


KMF Settings (3)

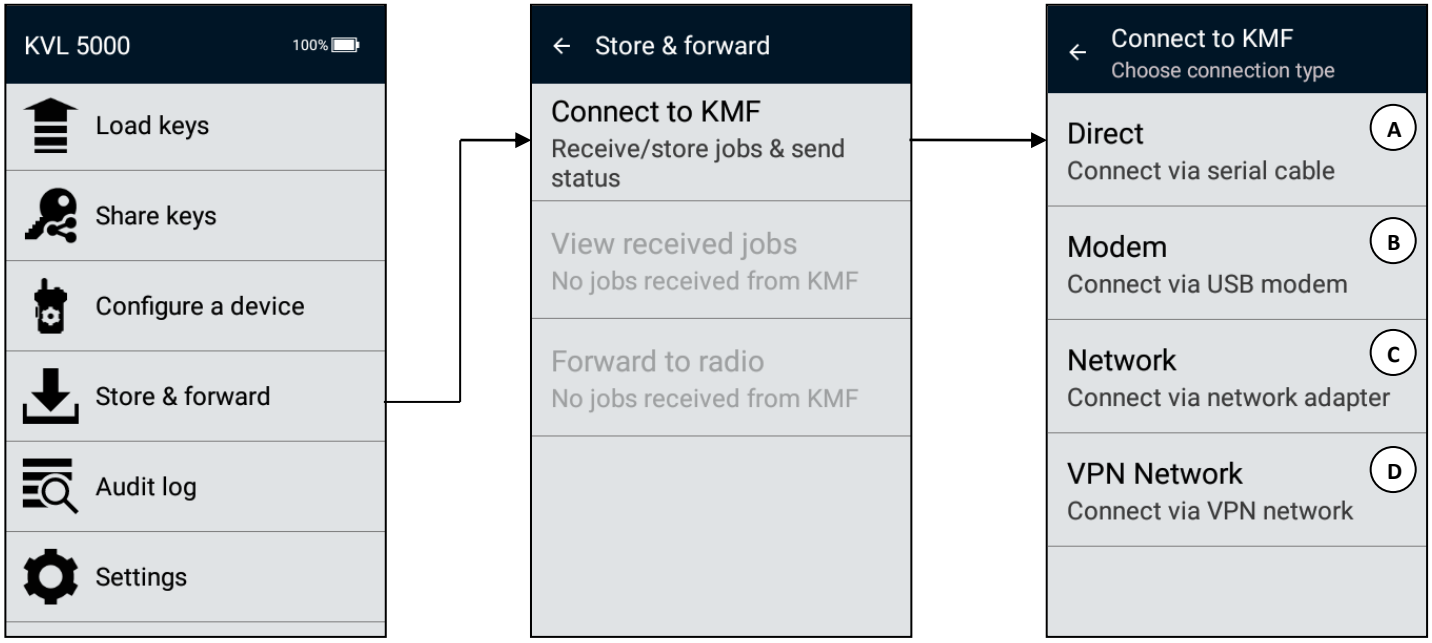




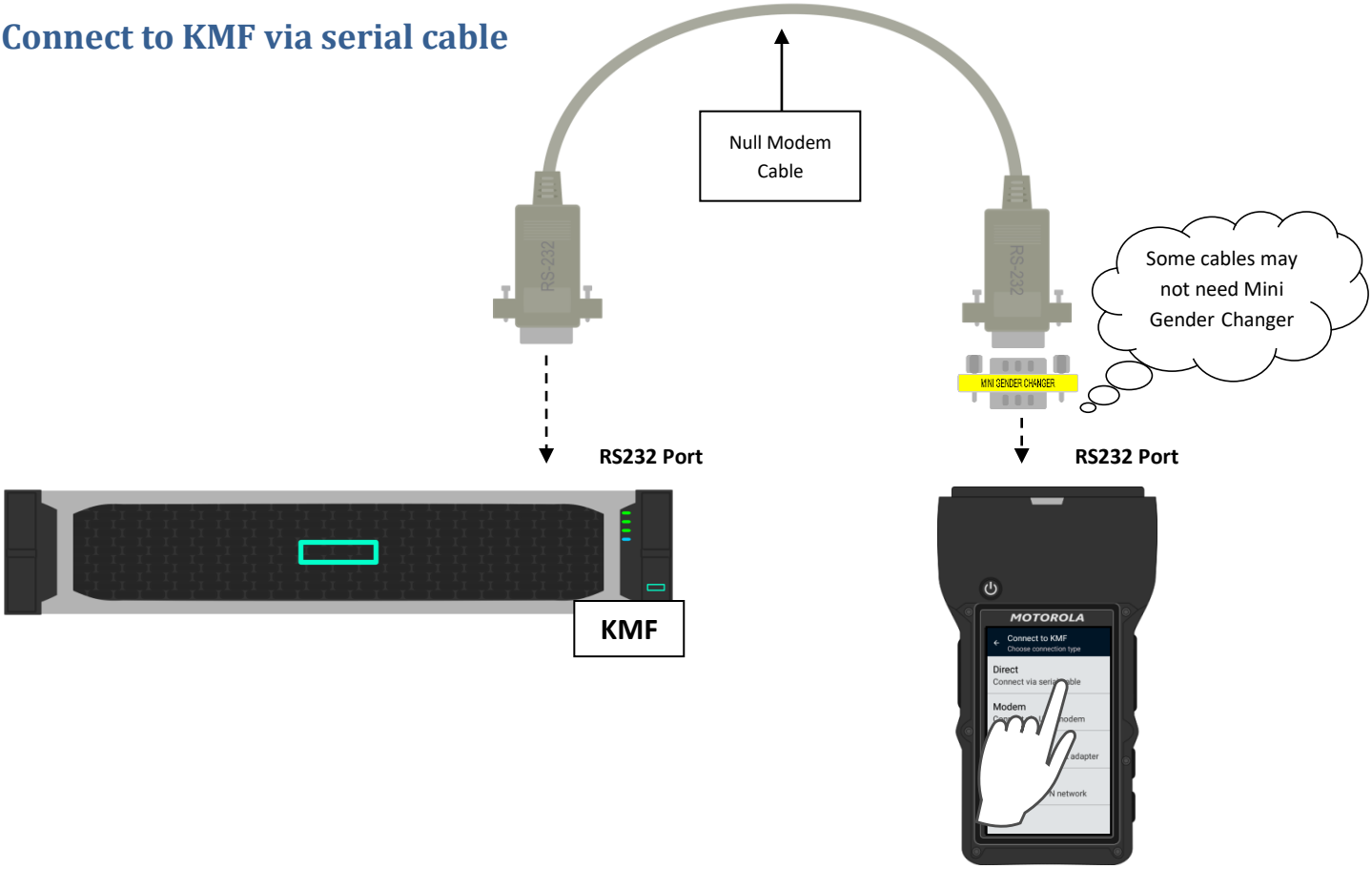
Entering the UKEK



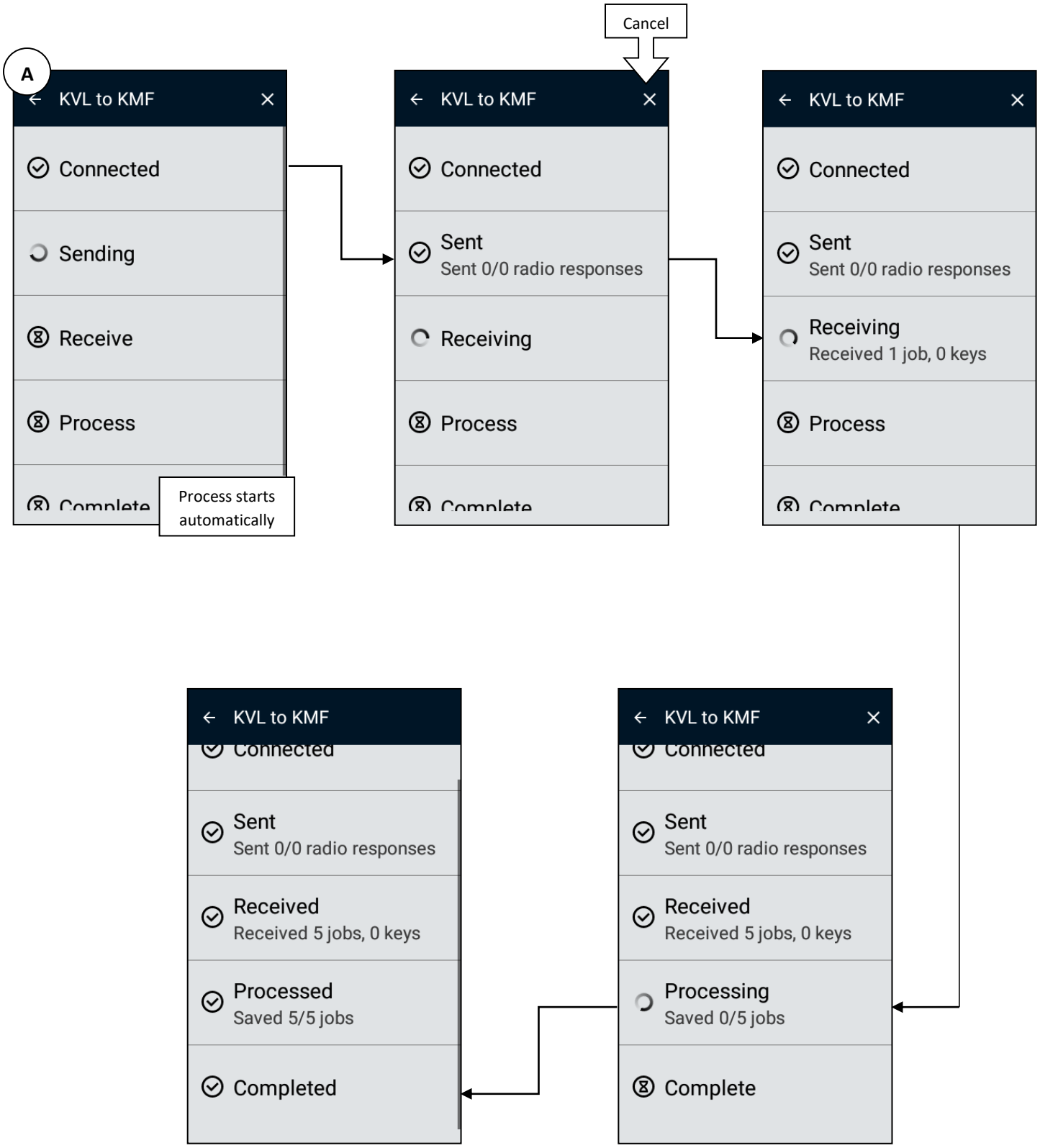
Make sure that the KVL battery is charged.



Connect to KMF via serial cable

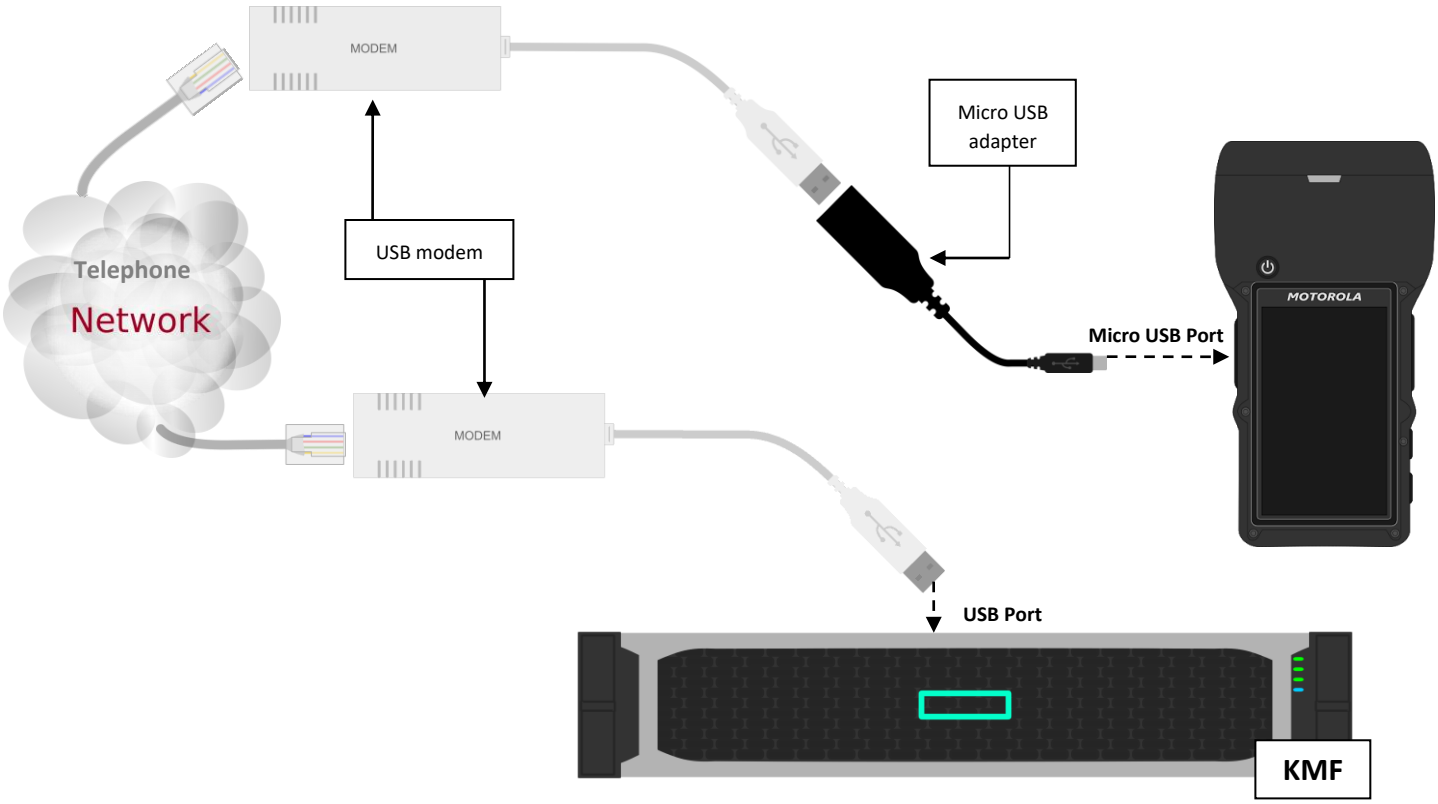


Direct Connection

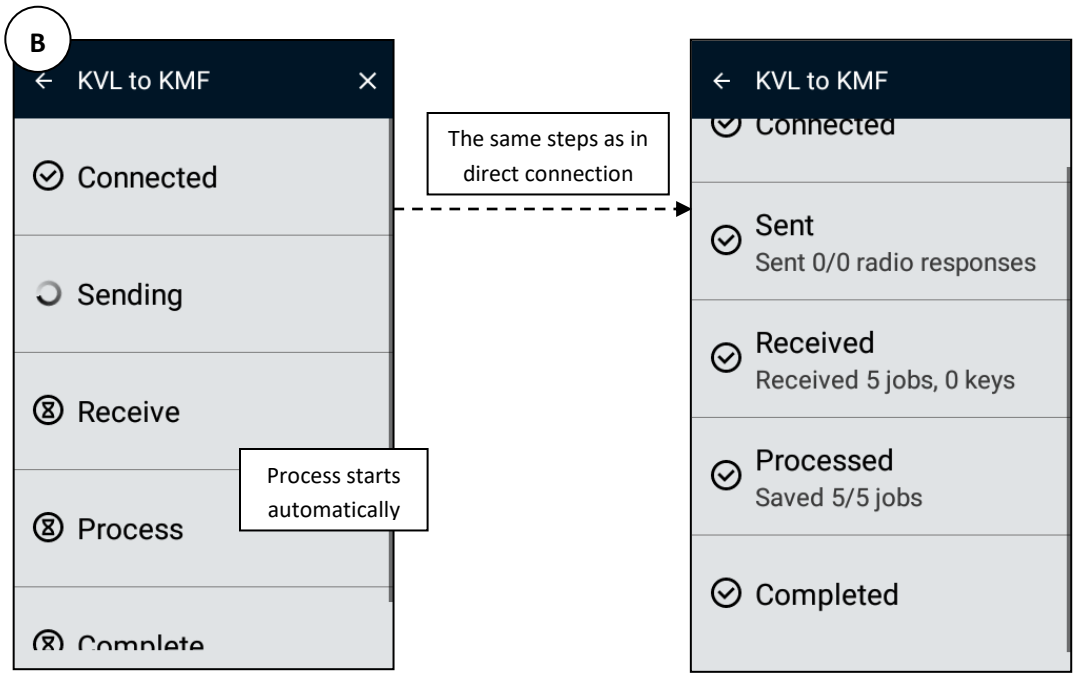


Connect to KMF via USB Modem

Phone number in KMF settings must be set

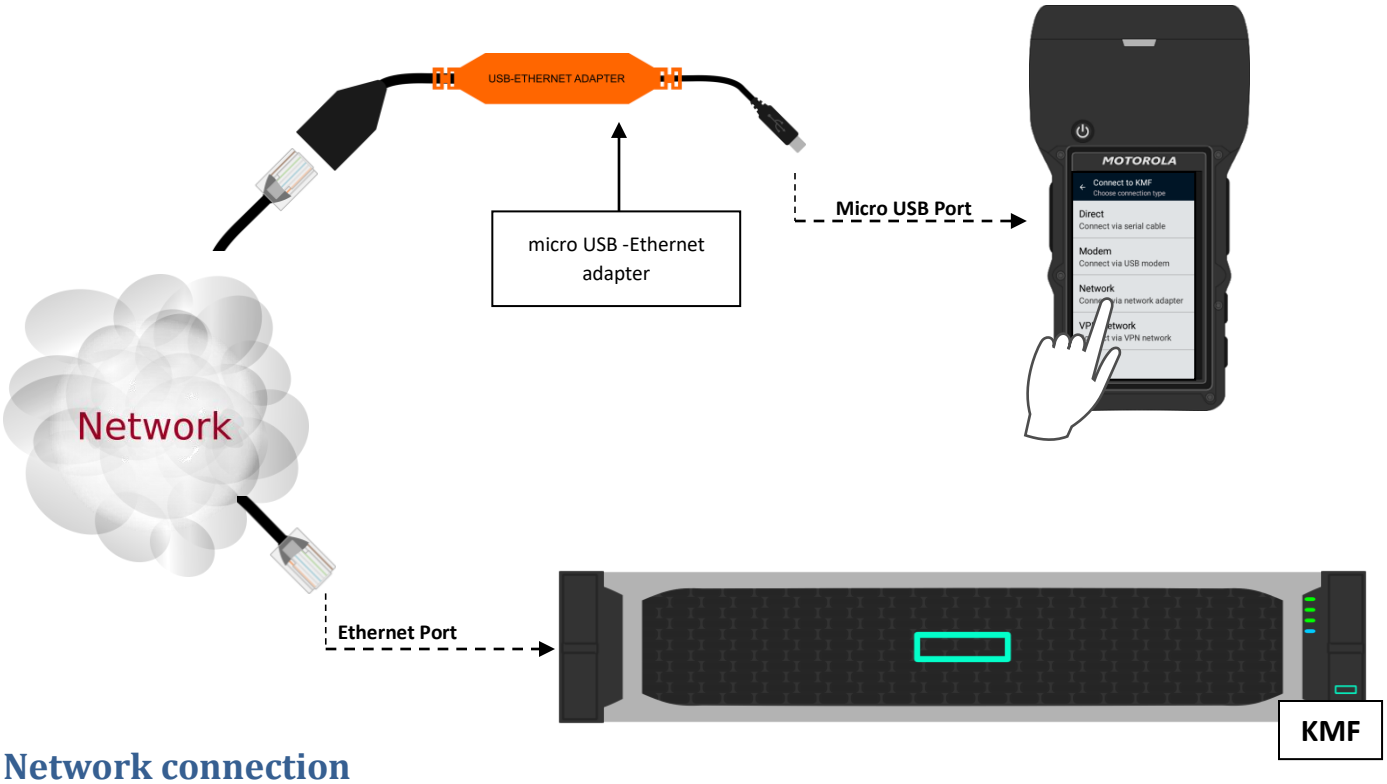


Modem connection

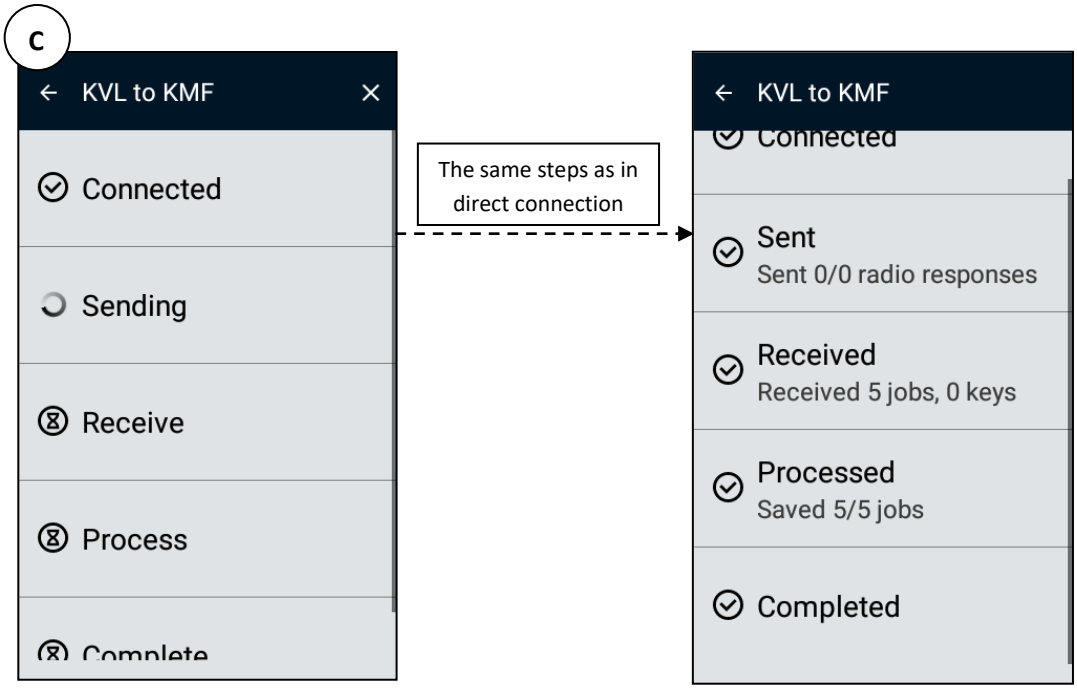


Connect to KMF via Network / VPN Network

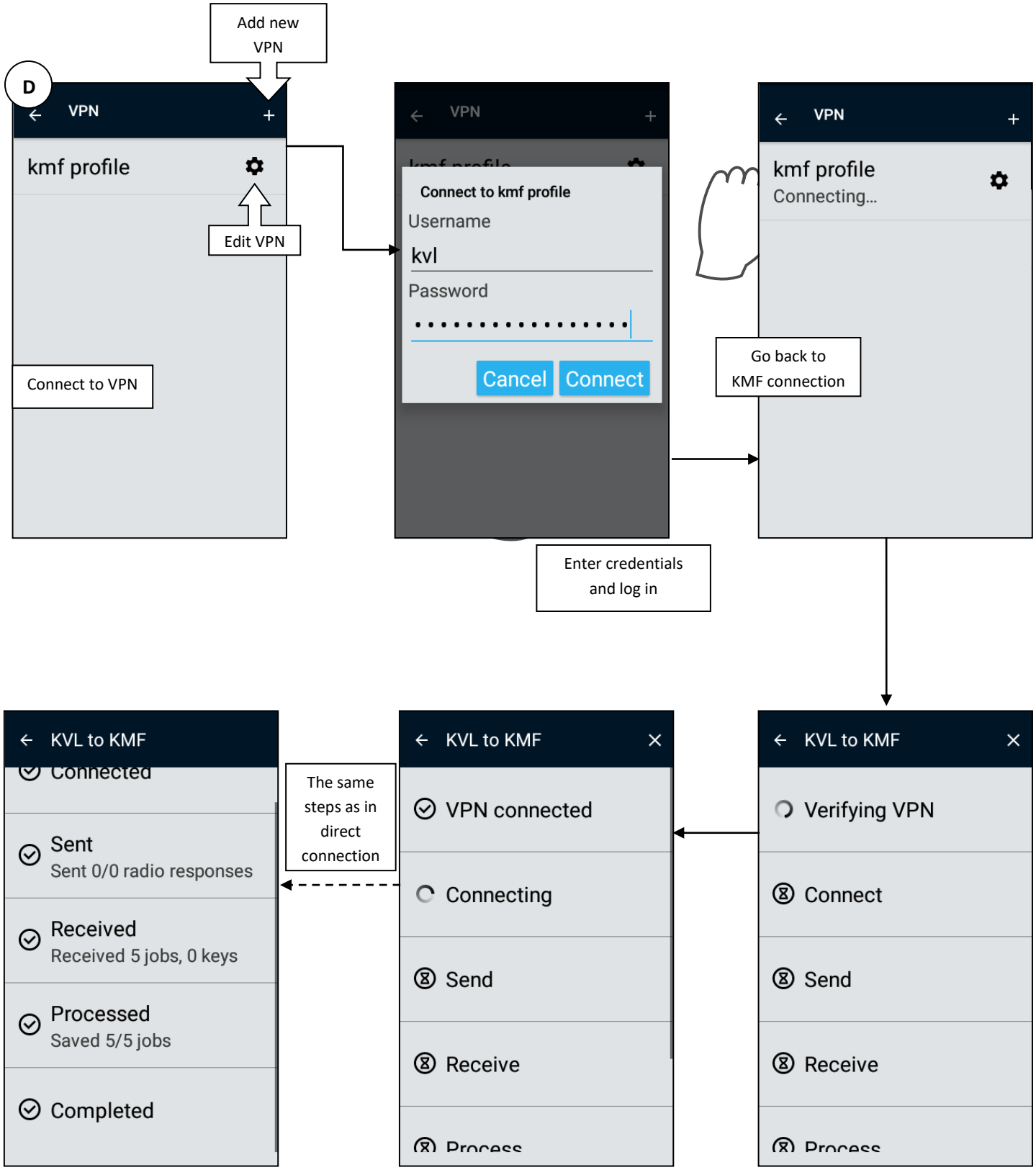
IP address in KMF settings must be set



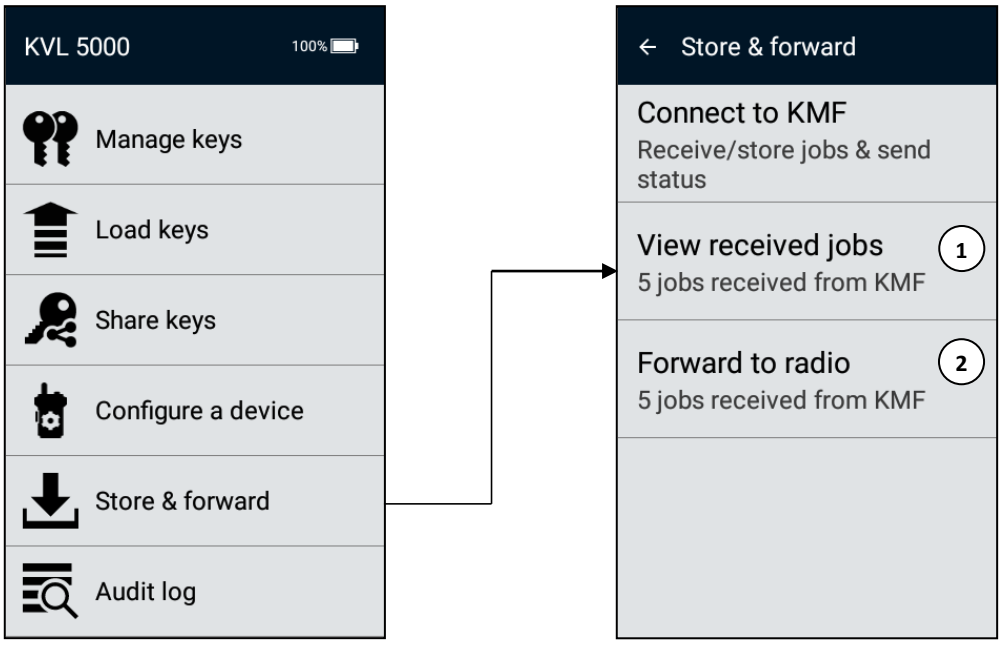
Network connection



VPN Connection

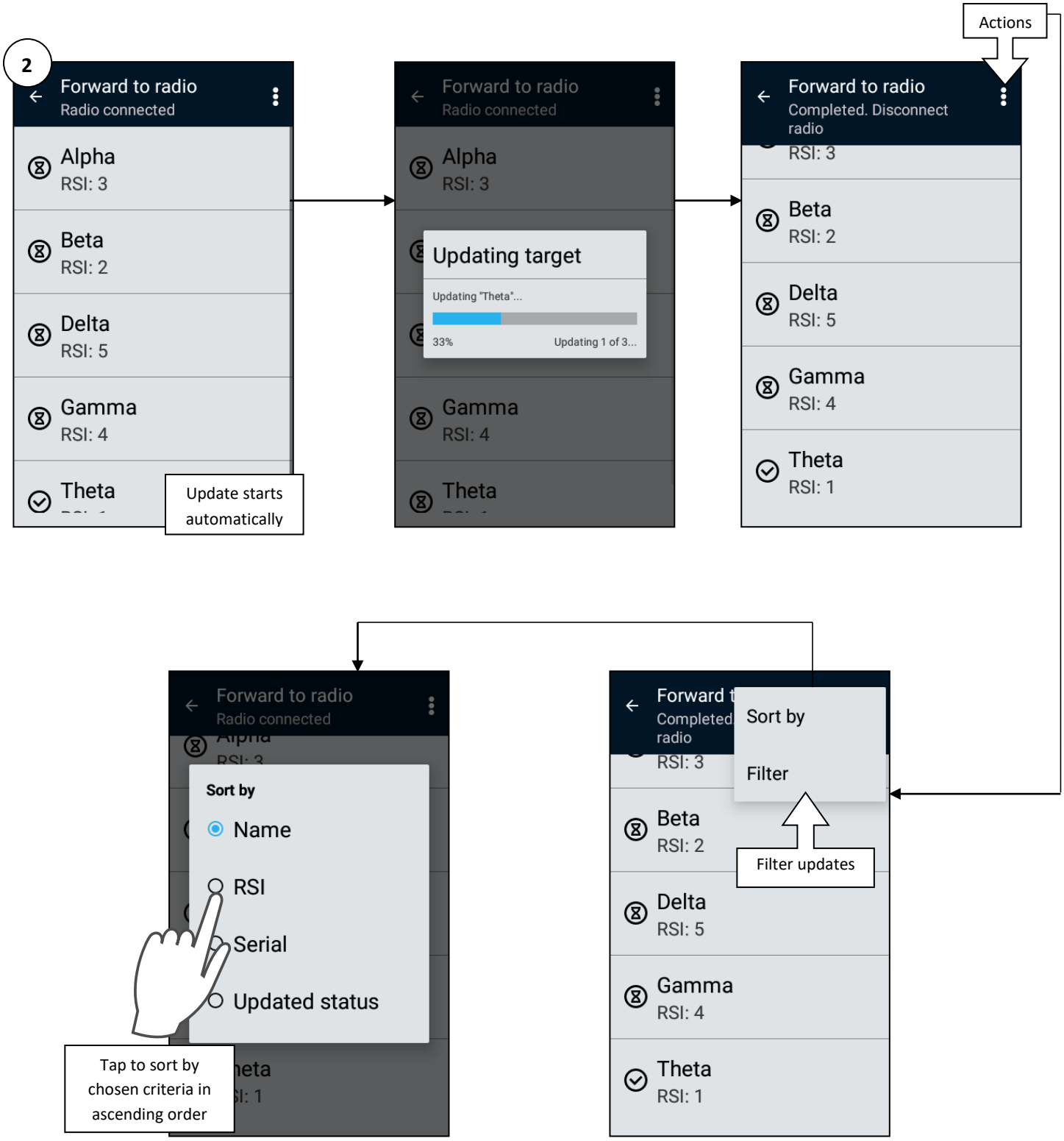


Connect target device to a KVL

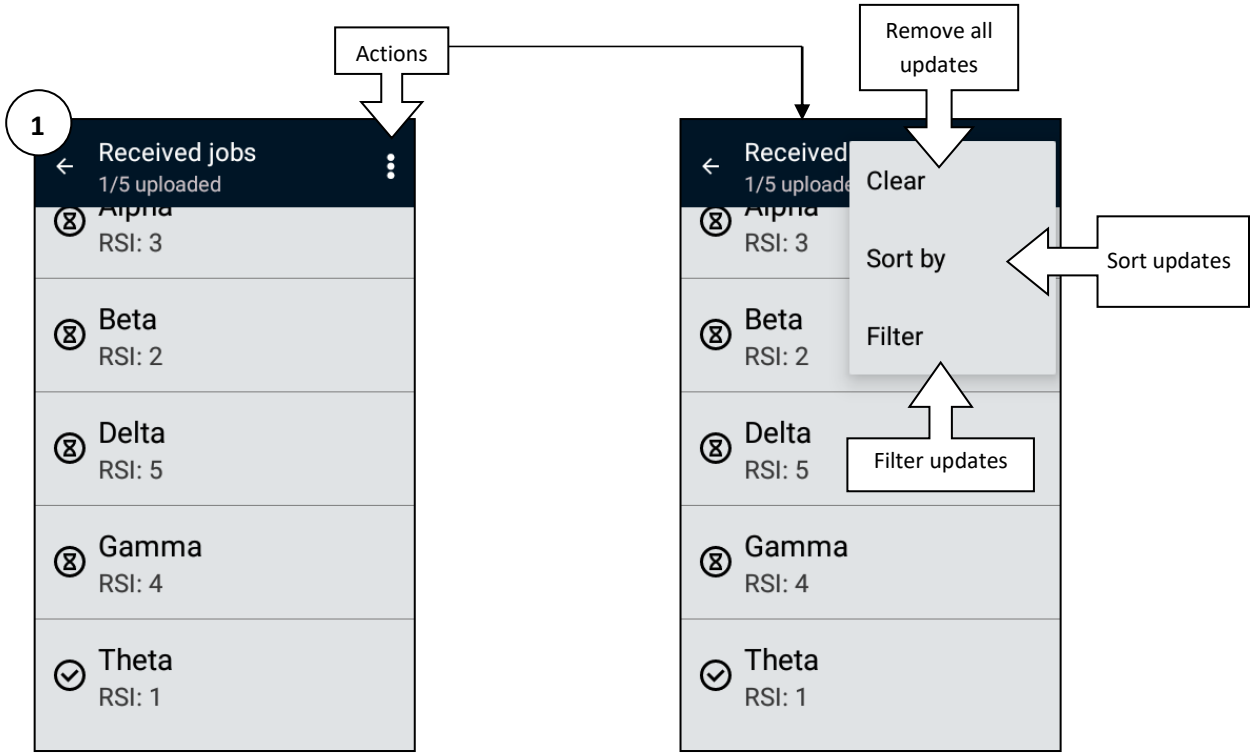


You can also perform forward to mobile radio over control head using serial cable. To do that you must first <u>Provision mobile radio with control head keys</u>

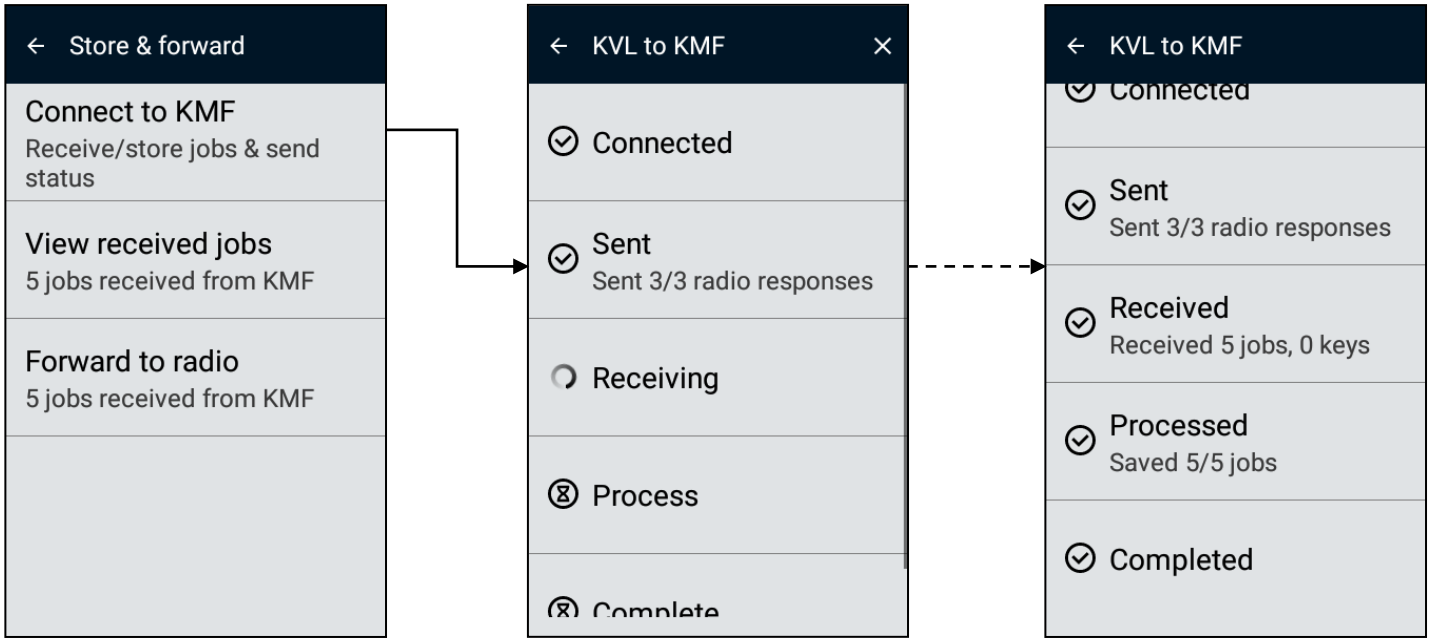
Forward jobs to a target device



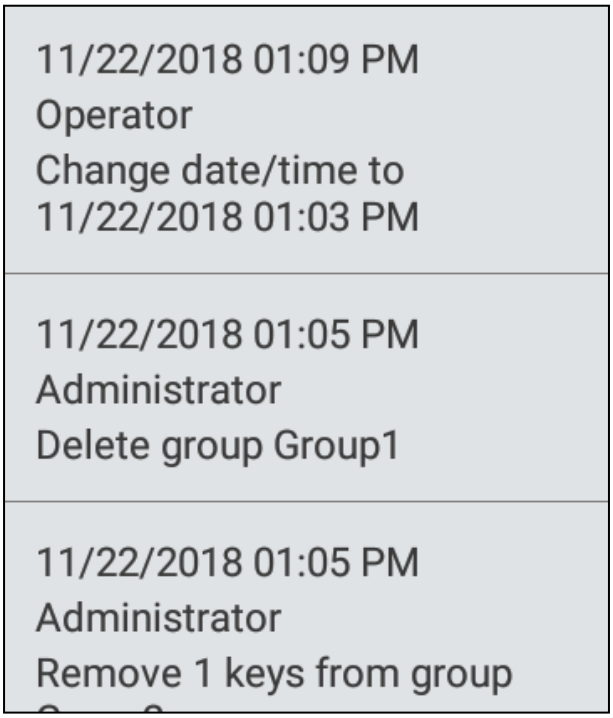
Viewing and clearing received jobs



Upload the unit response messages to KMF

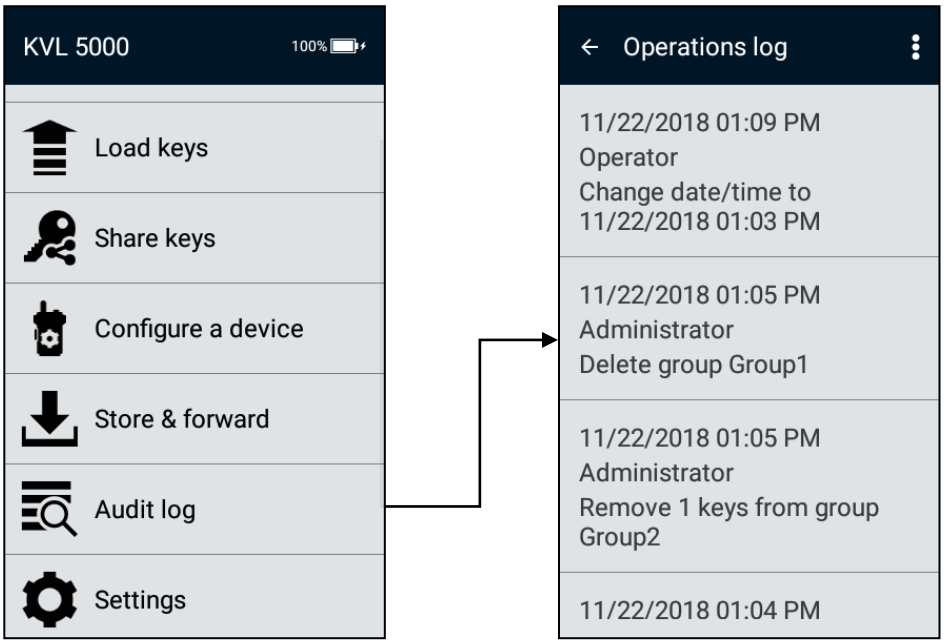


Audit Log

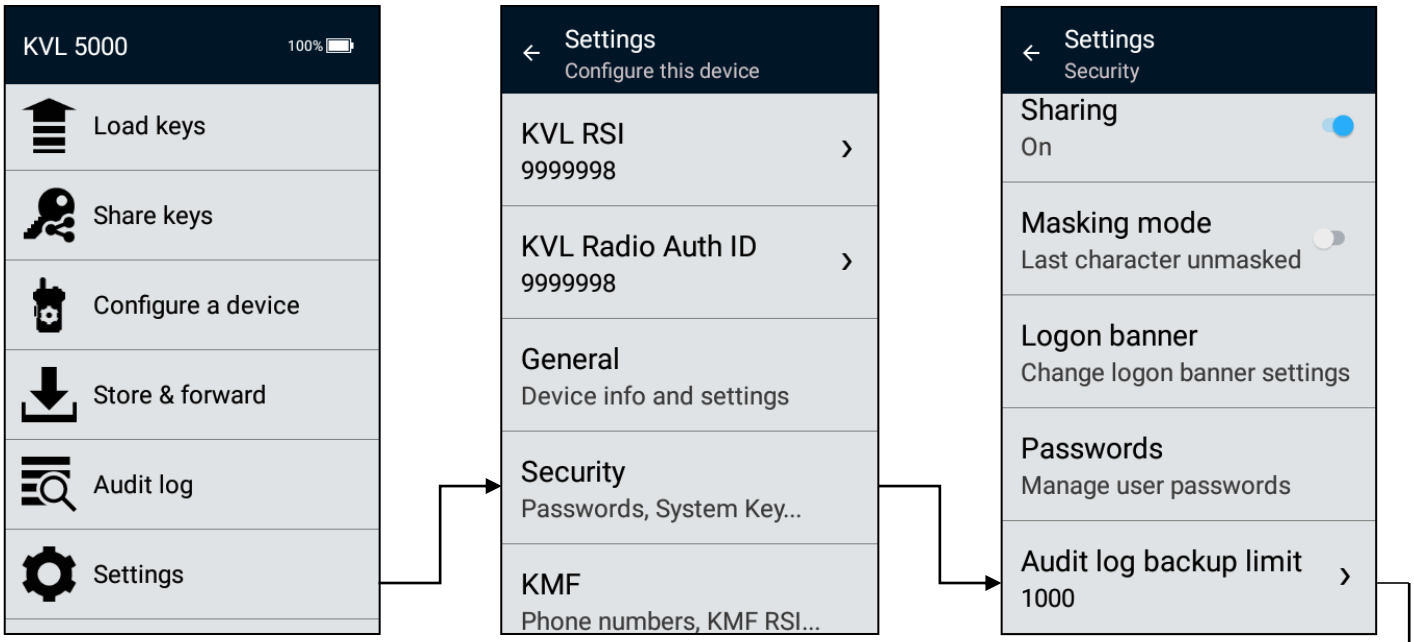


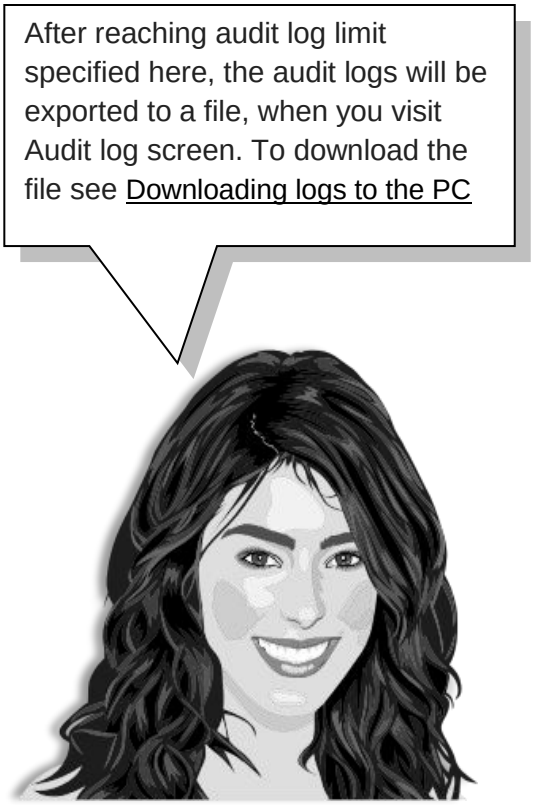
Reading the logs

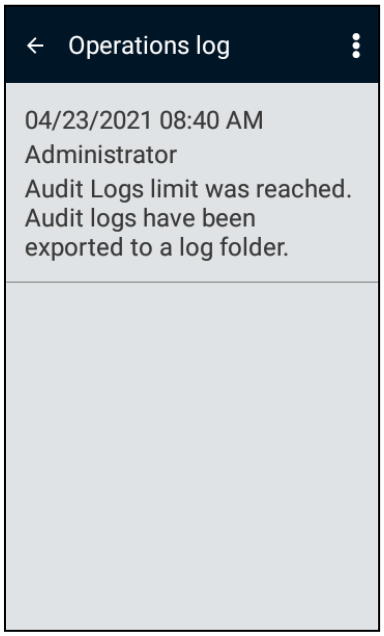
Every user can read operation logs accessing it via Audit Log icon.

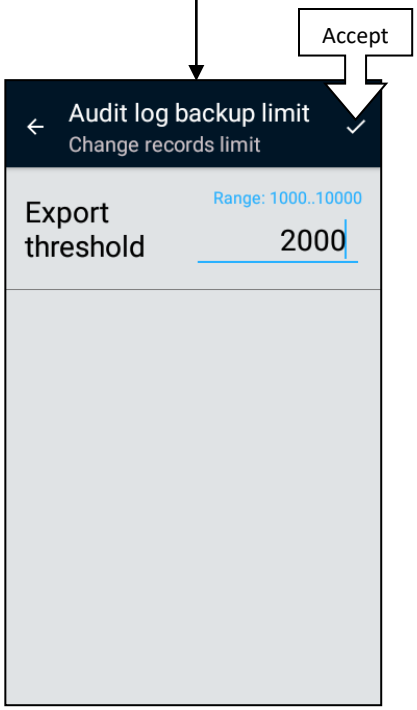


Audit log backup limit



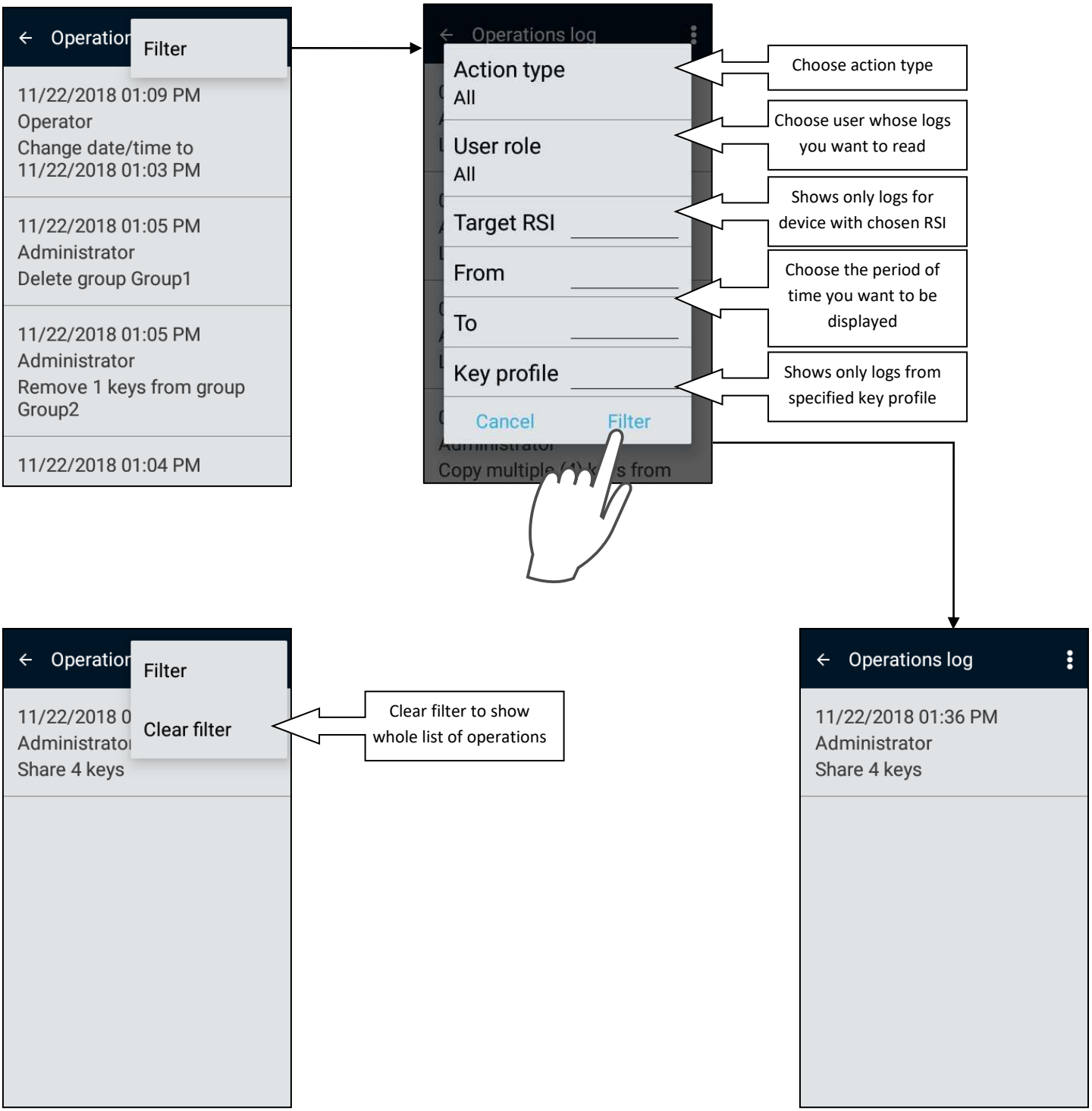




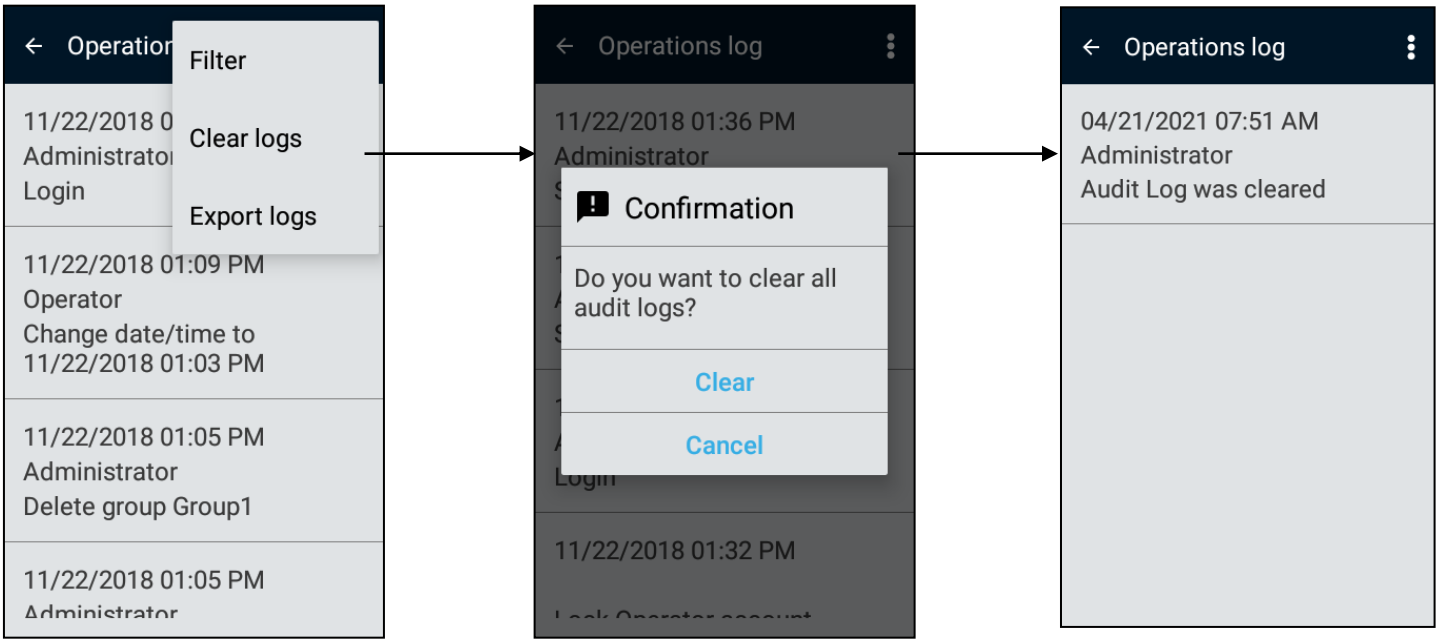


Filtering logs

User can filter logs to narrow the list of logs.

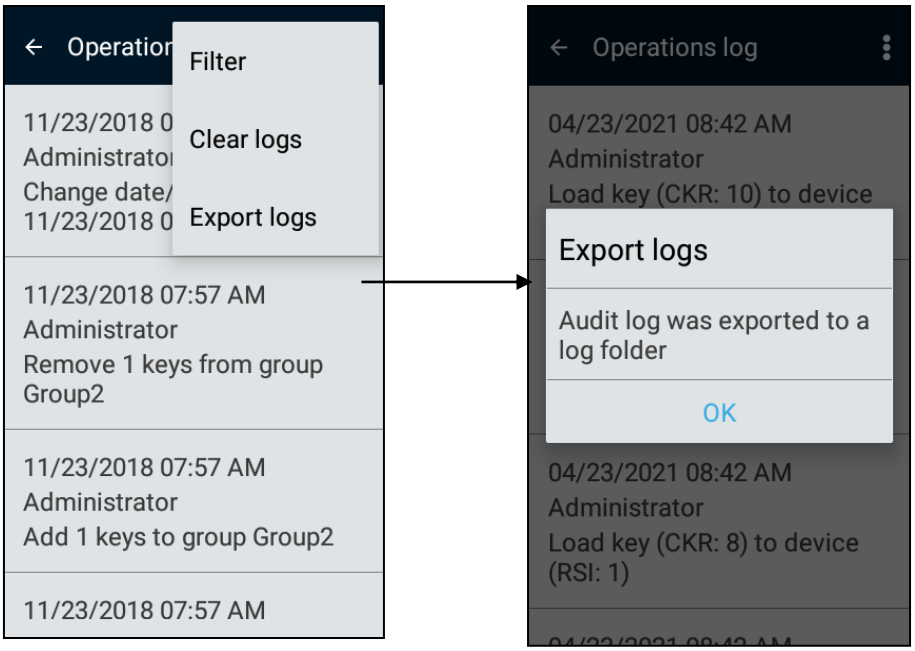


Administrator can clear operations log.



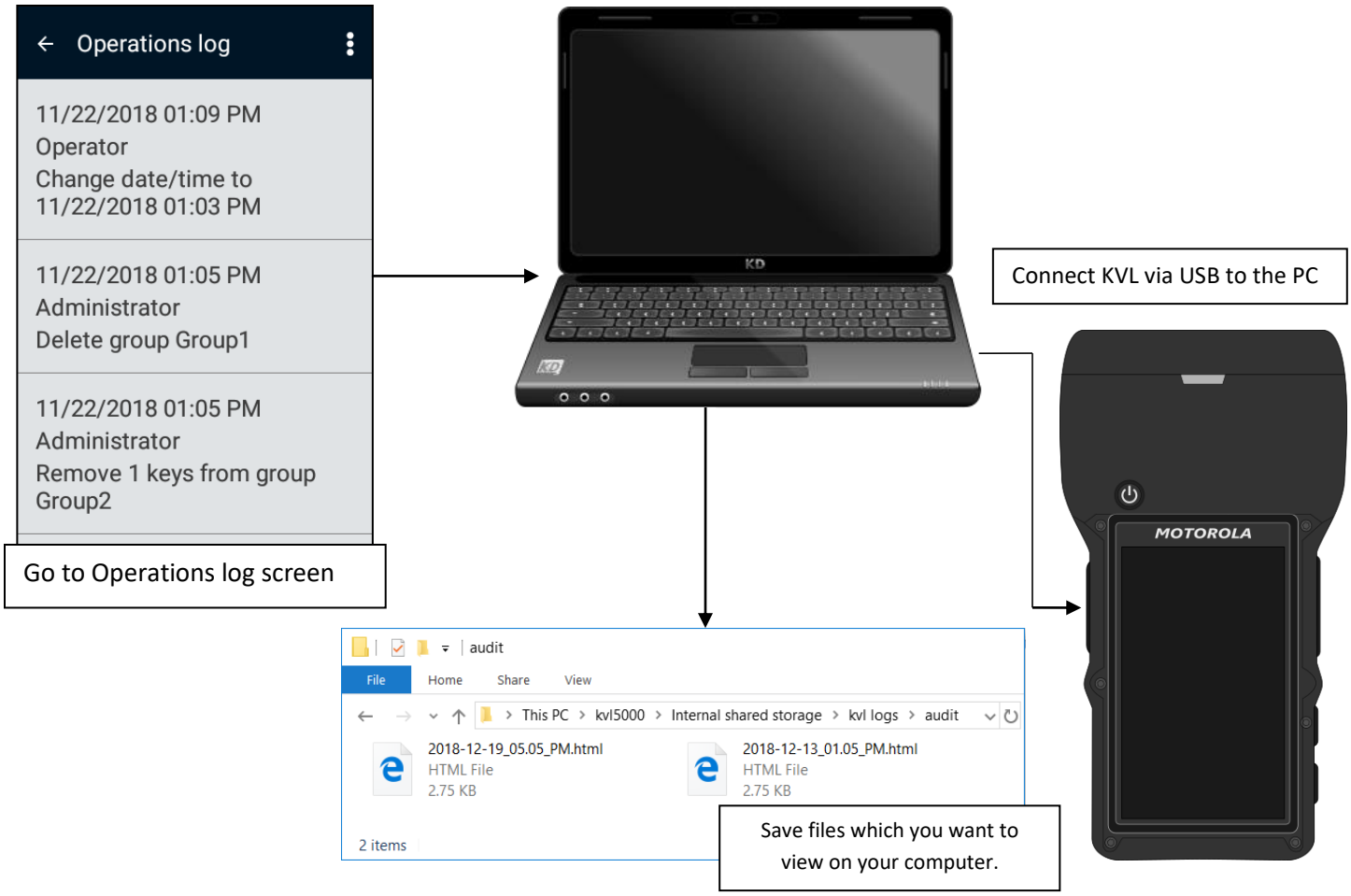
Exporting logs

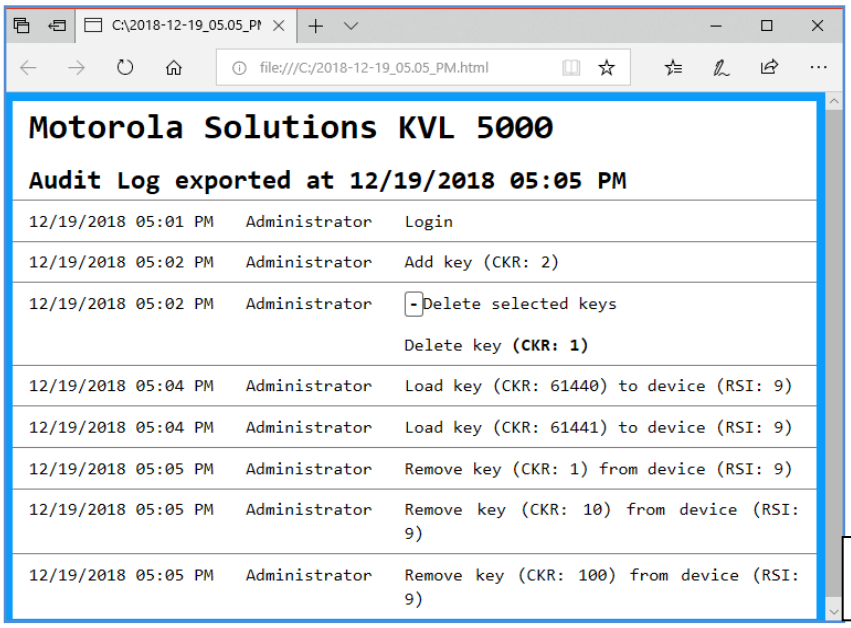
Administrator can export logs to HTML file for detailed operations log.



Downloading logs to the PC

After exporting logs, Administrator can download exported logs into PC





Motorola Solutions KVL 5000

Audit Log exported at 12/19/2018 05:05 PM

12/19/2018 05:01 PM	Administrator	Login
12/19/2018 05:02 PM	Administrator	Add key (CKR: 2)
12/19/2018 05:02 PM	Administrator	- Delete selected keys Delete key **(CKR: 1)**
12/19/2018 05:04 PM	Administrator	Load key (CKR: 61440) to device (RSI: 9)
12/19/2018 05:04 PM	Administrator	Load key (CKR: 61441) to device (RSI: 9)
12/19/2018 05:05 PM	Administrator	Remove key (CKR: 1) from device (RSI: 9)
12/19/2018 05:05 PM	Administrator	Remove key (CKR: 10) from device (RSI: 9)
12/19/2018 05:05 PM	Administrator	Remove key (CKR: 100) from device (RSI: 9)

.html file provides more details about operations.

Operator permissions

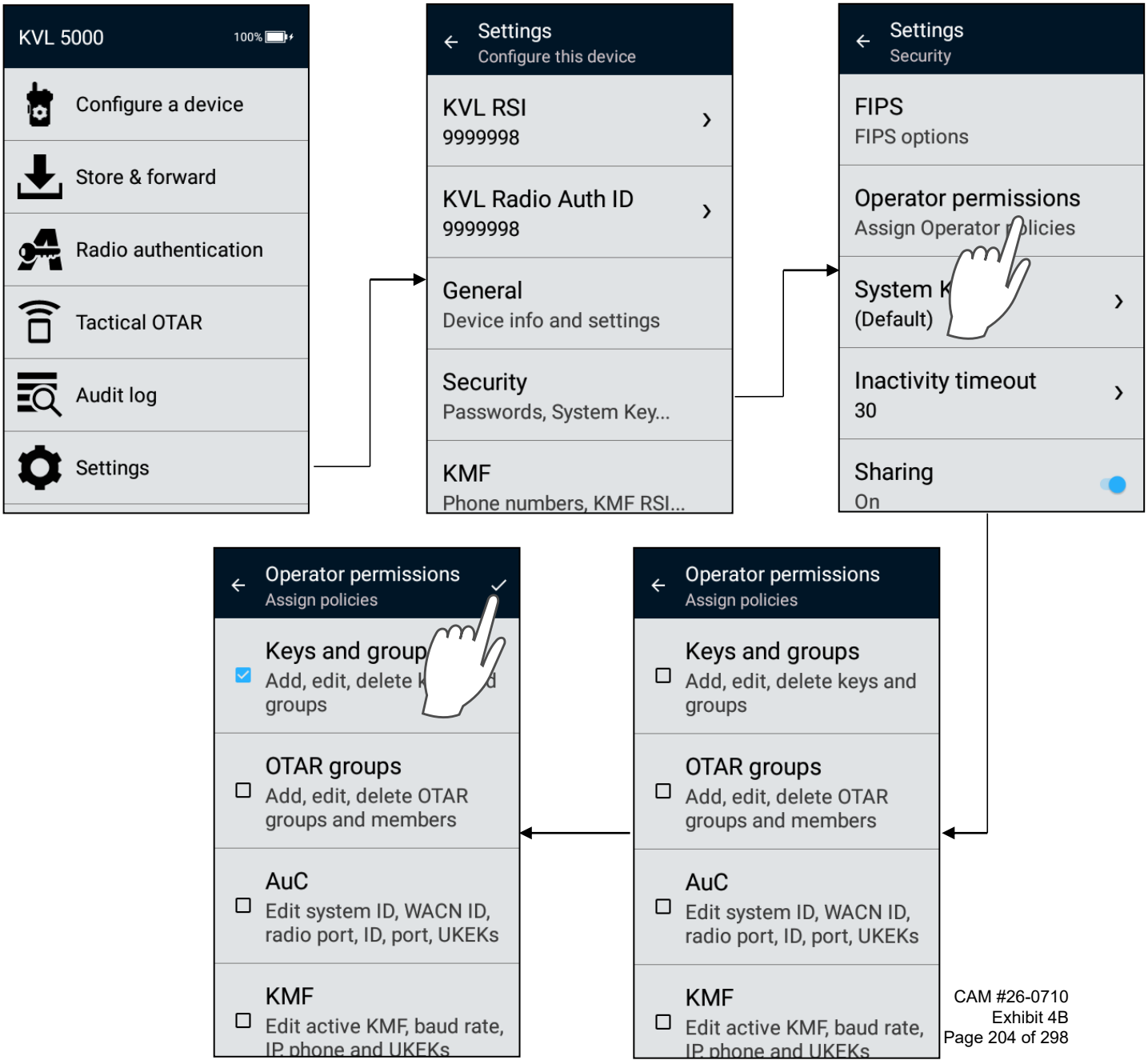
The Administrator has access to all functions and features. The Operator does **not** have access to the following functions and features:

- ✘ Upgrading Crypto Module of the KVL and radio
- ✘ Upgrading KVL software
- ✘ Adding, deleting, and editing keys and groups of keys
- ✘ Entering and changing KVL Radio Set Identifier (RSI)
- ✘ Entering and changing KVL Radio Authentication ID
- ✘ Entering and changing KMF RSI
- ✘ Setting and changing the KVL inactivity timeout
- ✘ Changing Federal Information Processing Standard (FIPS) mode
- ✘ Changing the System Key
- ✘ Changing the Sharing mode
- ✘ Changing the USB key load mode and port
- ✘ Changing the Key File Export mode
- ✘ Changing the Administrator password
- ✘ Changing the certain KMF parameters: port value, IP address, phone number
- ✘ Changing the certain AuC parameters: System ID, WACN ID, port value, IP address
- ✘ Adding, deleting, and editing OTAR groups
- ✘ Updating OTAR groups
- ✘ Entering and changing KMF RSI
- ✘ Entering and changing KMF Message Number Period (MNP)
- ✘ Changing UKEK for KMF or AuC operation

- ✘ Clearing the list of received jobs
- ✘ Clearing the list of KSuId
- ✘ Clearing audit log records
- ✘ Setting password security options
- ✘ Renaming and clearing key profiles

Full Role based Action List available on KVL

Assigning additional operator permissions

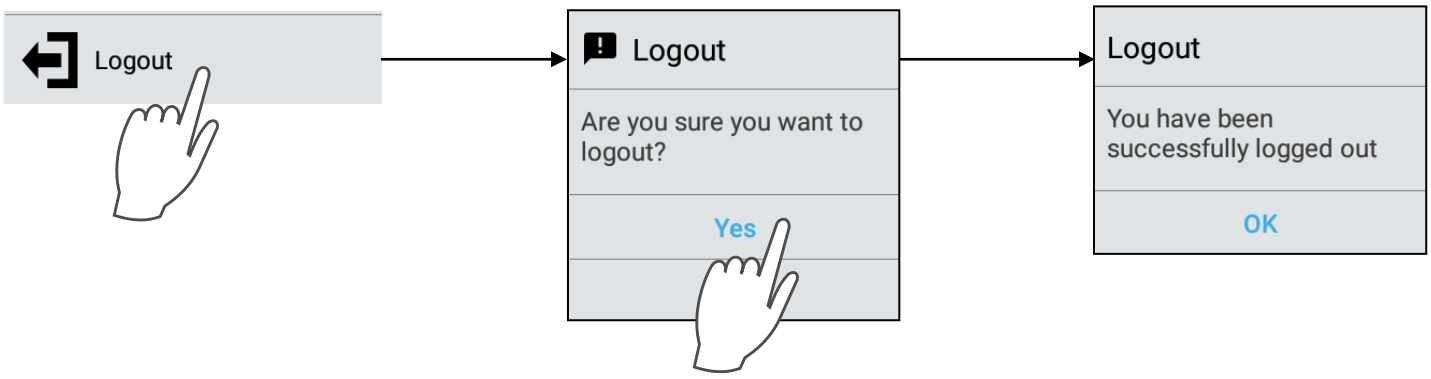


Operator permissions

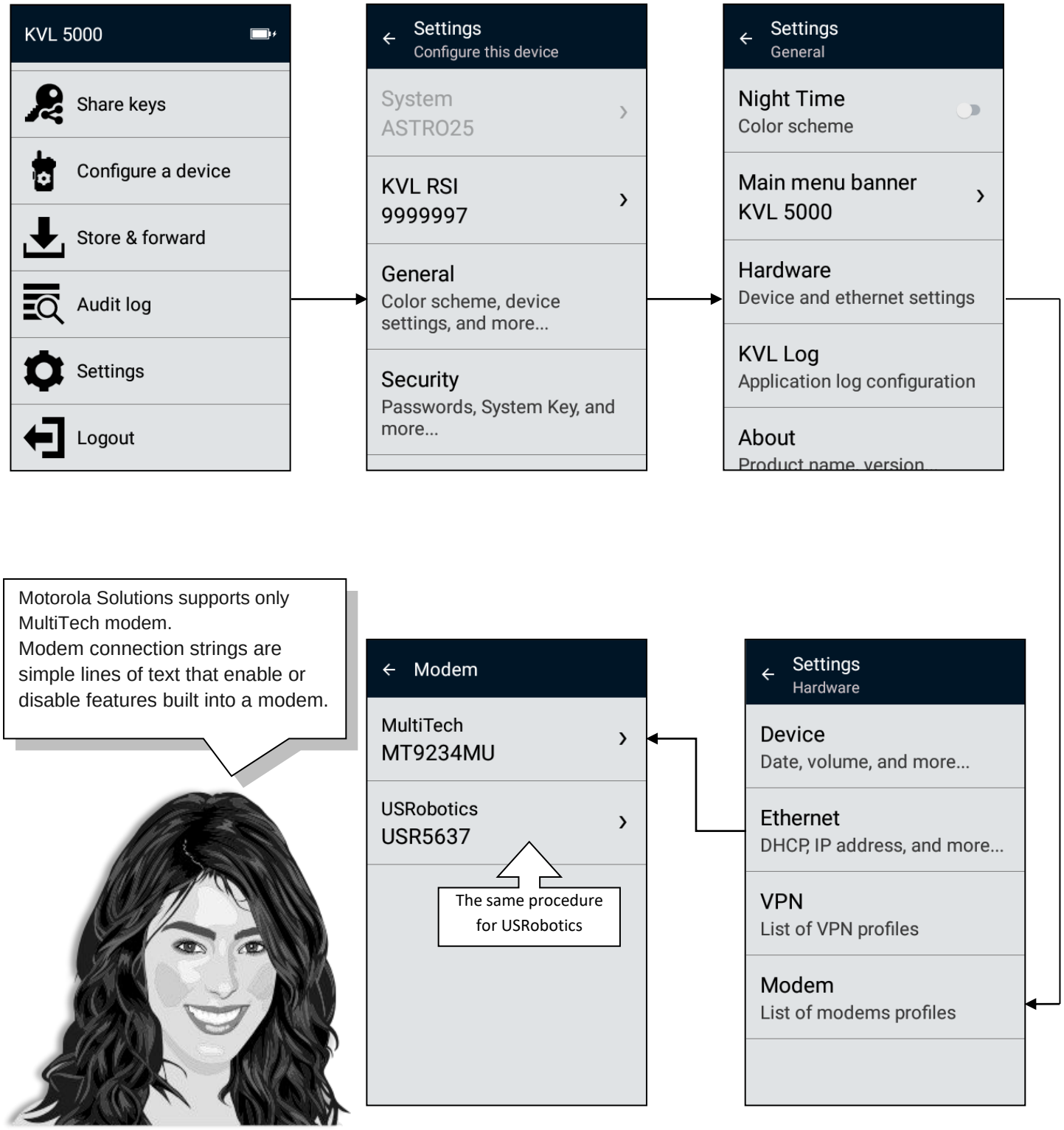
The Administrator can assign additional permissions for the Operator by selecting policies on Operator permissions menu. Policies give following functions and features for the Operator:

- Keys and groups
  - ✓ Adding, deleting, and editing keys and groups of key
- OTAR groups
  - ✓ Adding, deleting, and editing OTAR groups
- AuC
  - ✓ Changing the certain AuC parameters: System ID, WACN ID, port value, IP address
  - ✓ Changing UKEK for AuC operation
- KMF
  - ✓ Changing the certain KMF parameters: port value, IP address, phone number
  - ✓ Changing UKEK for KMF operation

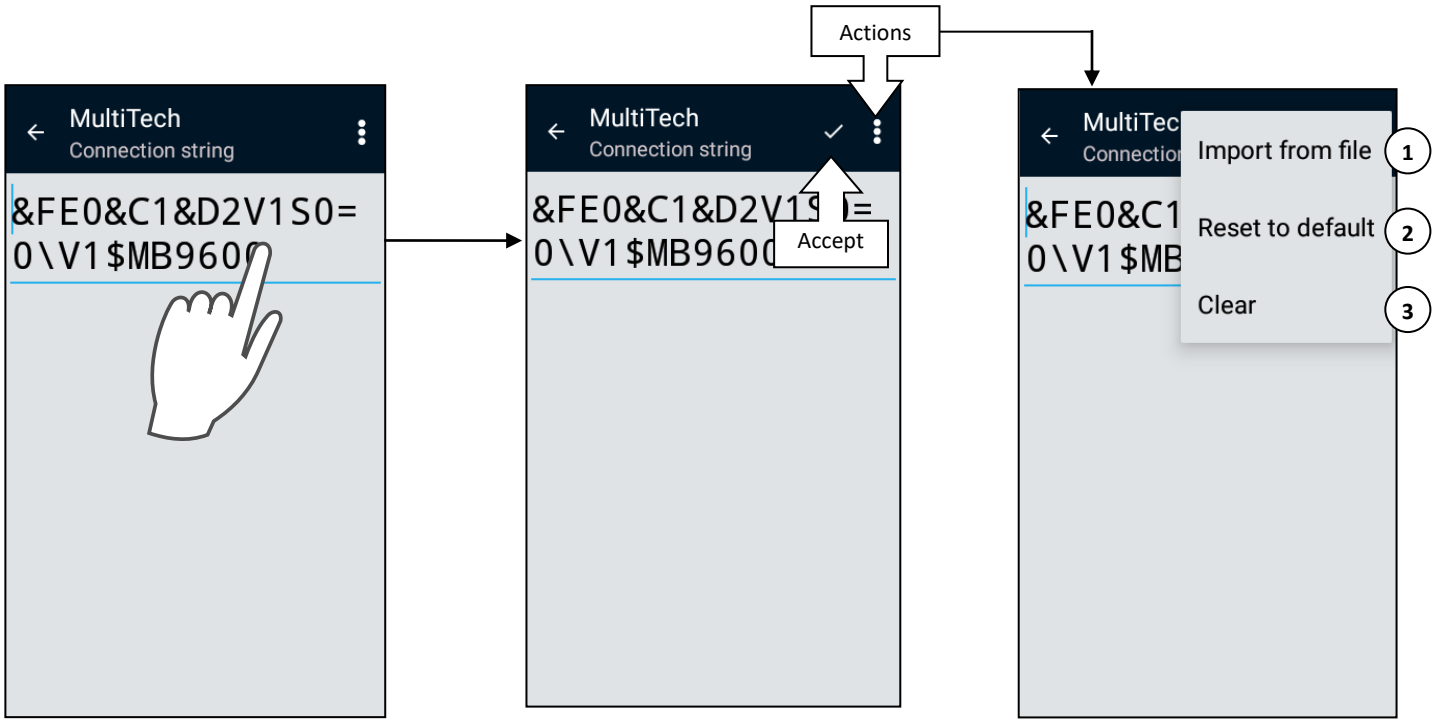
You can quickly switch between account types (Administrator or Operator) by logging off the current account.

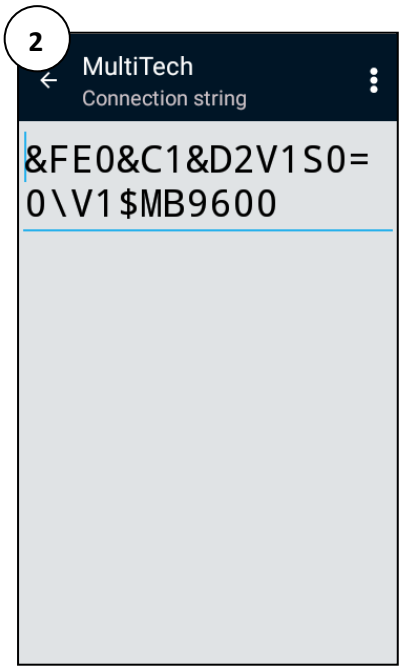


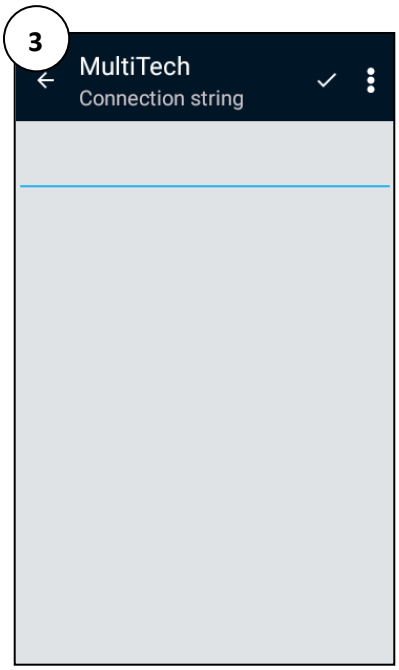
Edit Modem Connection String (1)

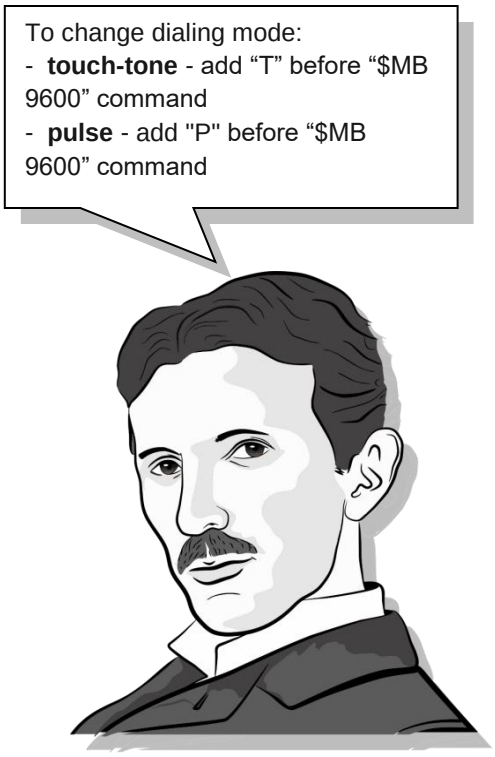


Edit Modem Connection String (2)

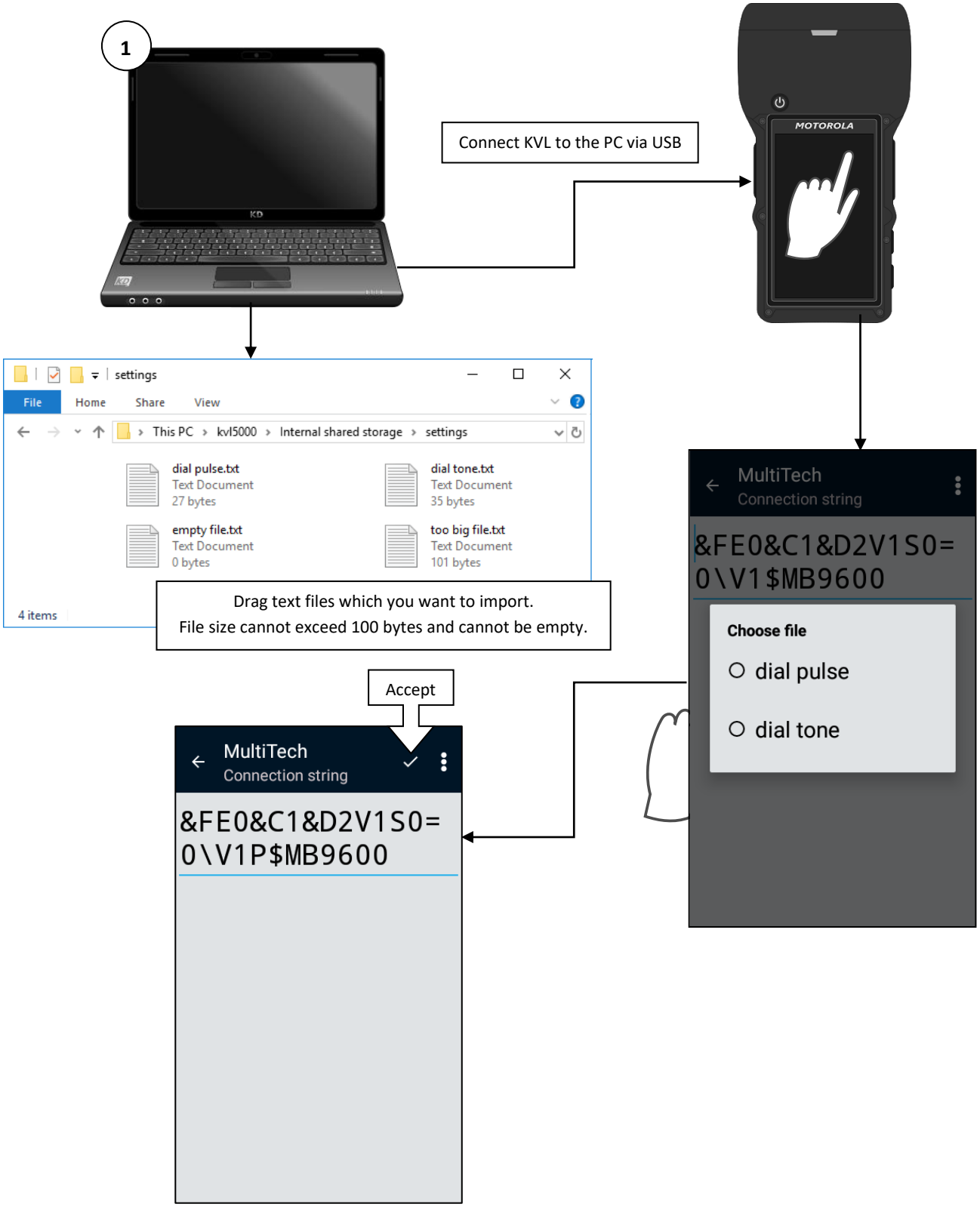






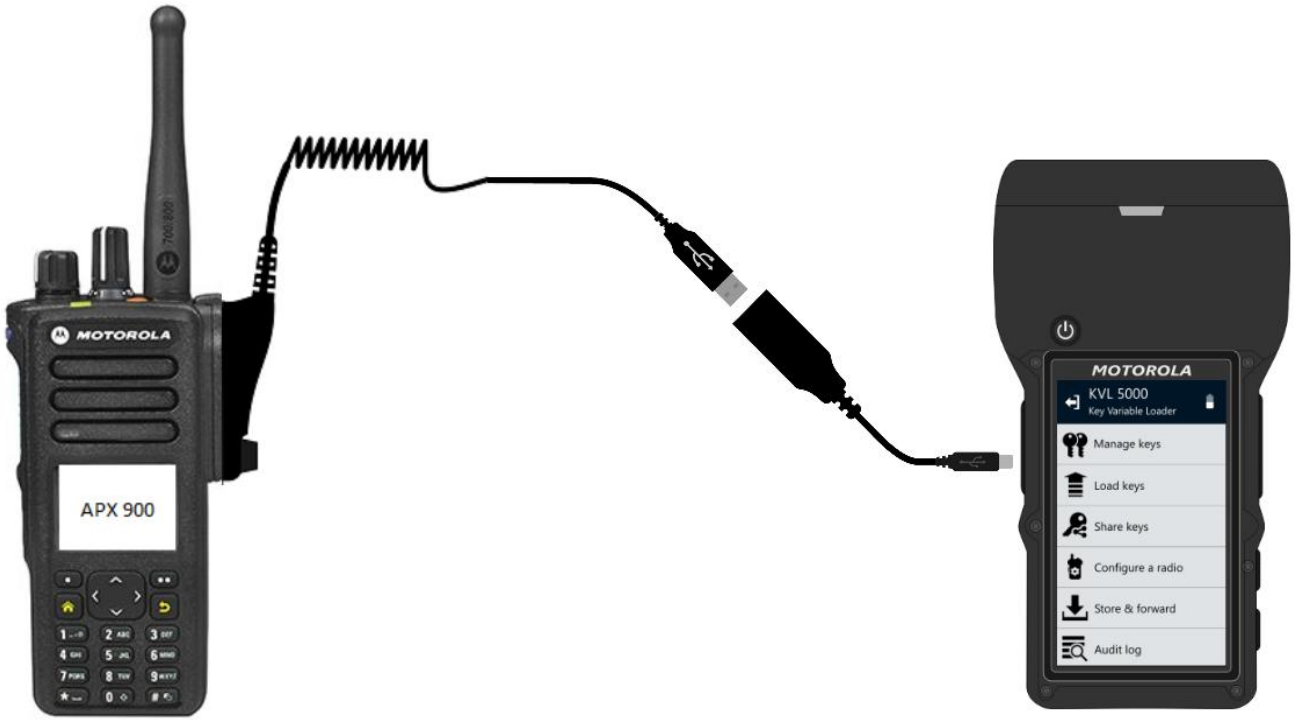


Import Modem Connection String



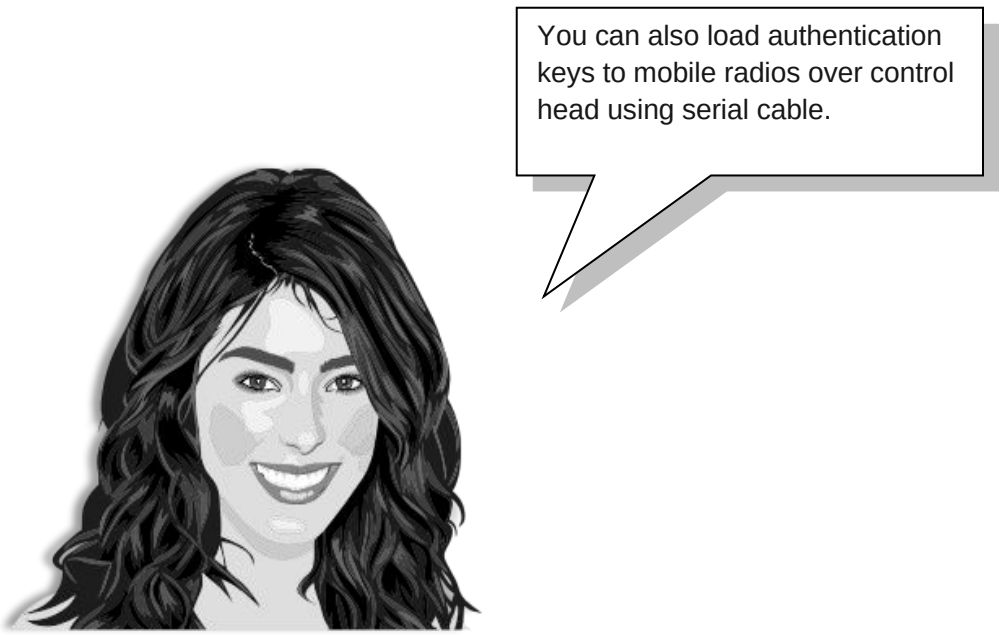
Provision radio

Radio provisioning is an operation of loading authentication key to a device. All Motorola radios configured for the radio authentication feature are supported. The radio provisioning is executed using RS-232 cable.



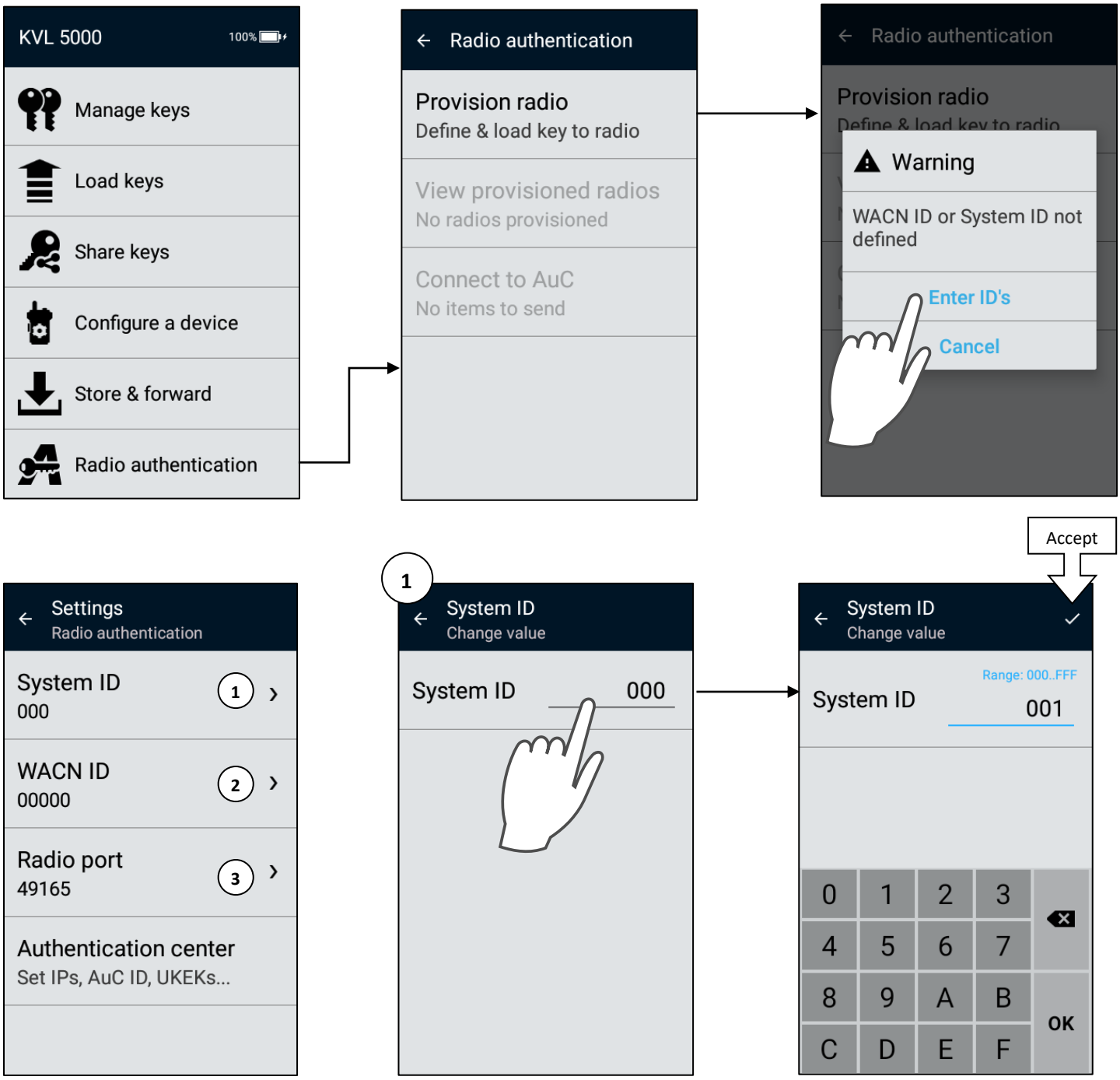
You can also connect devices over USB that support software encryption to perform key load operation when USB key loading feature is enabled.

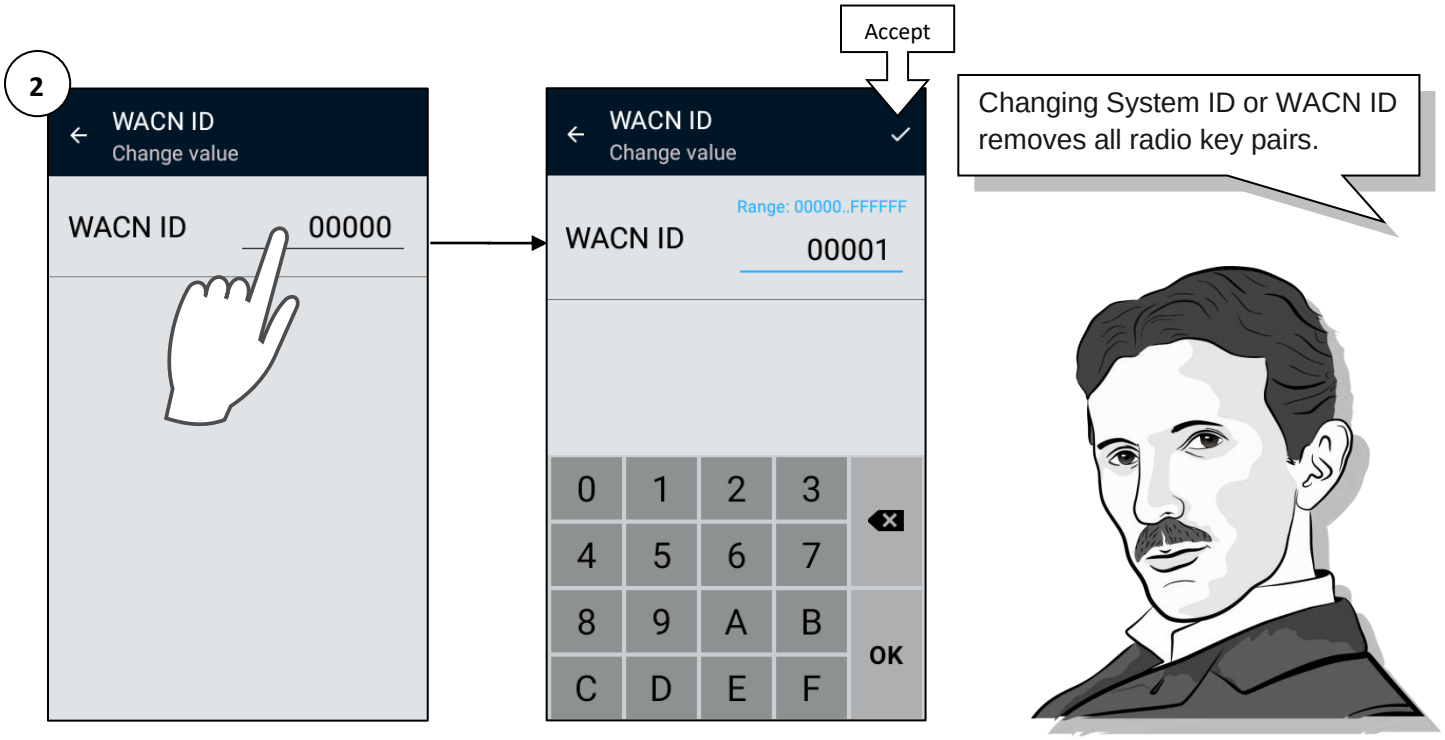
KVL 5000
Manage keys
Load keys
Share keys
Configure a device
Store & forward
Audit log
Motorola
APX 6500
SMARTCONNECT


You can also load authentication keys to mobile radios over control head using serial cable.

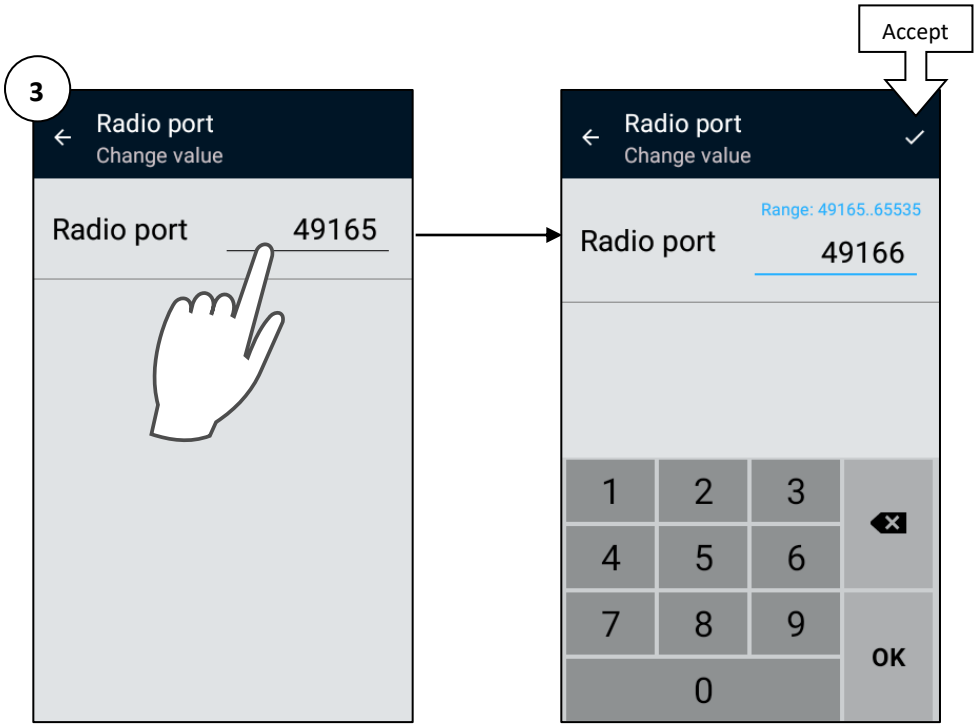
Radio provision settings

Before provisioning a radio there is a need to define System ID and WACN ID.

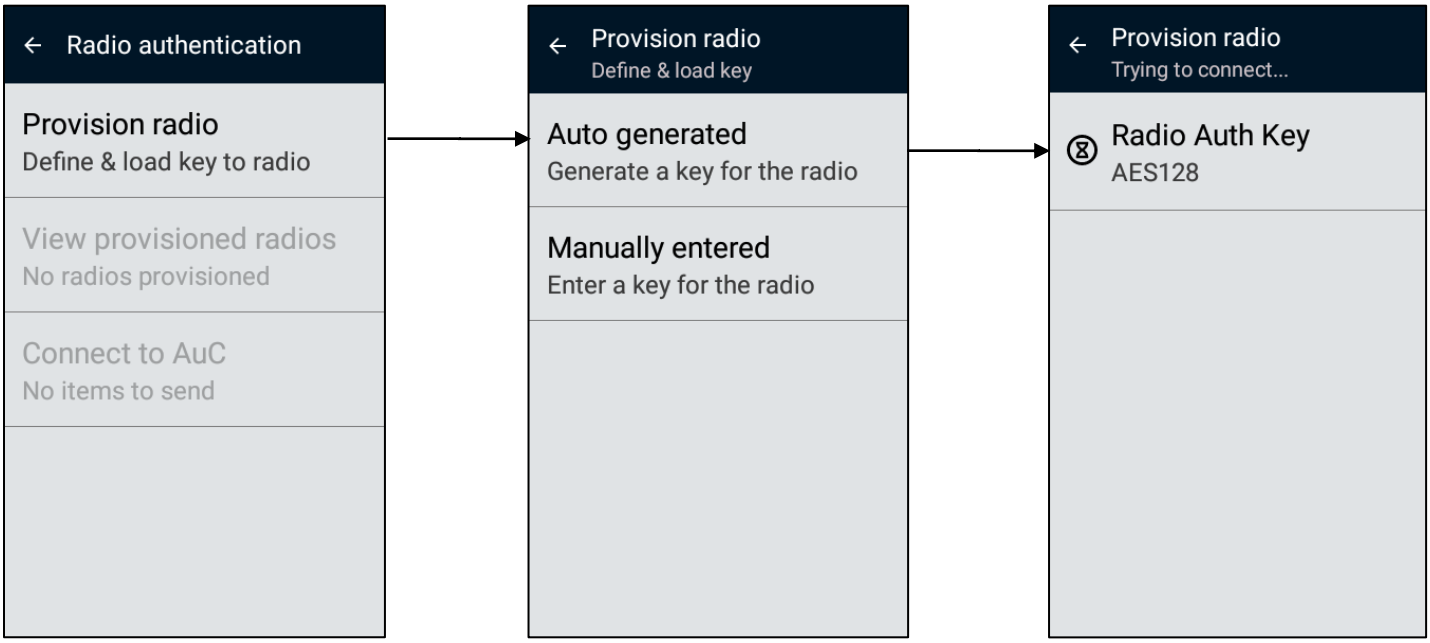


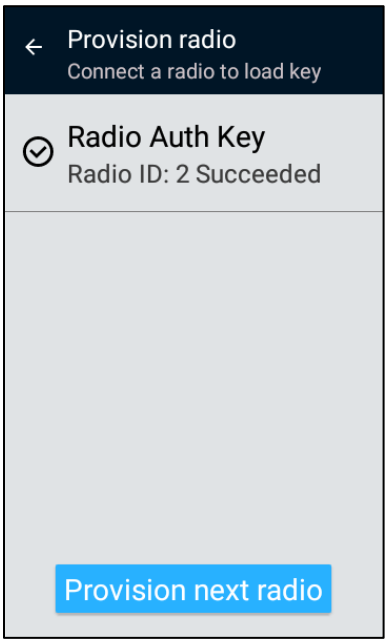


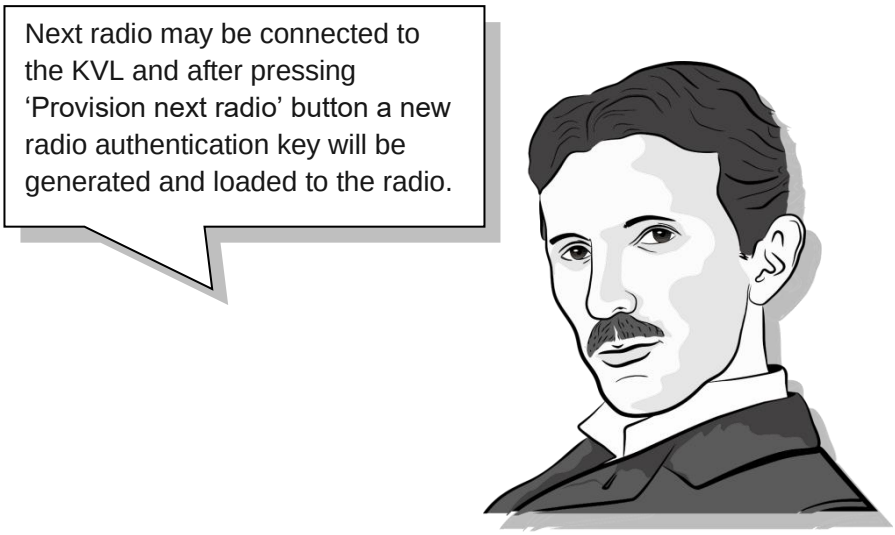
Additionally a radio port for radio authentication can be modified.



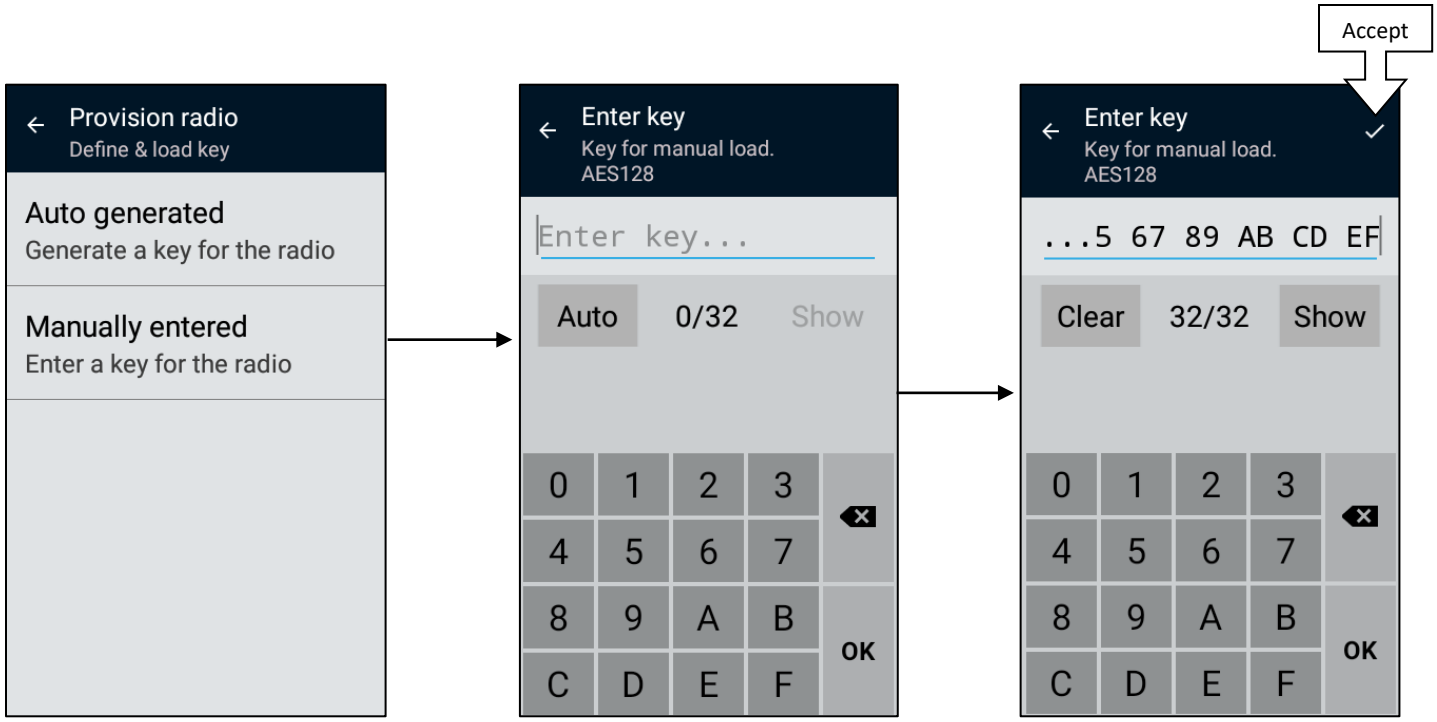
Provision radio with auto generated authentication key.

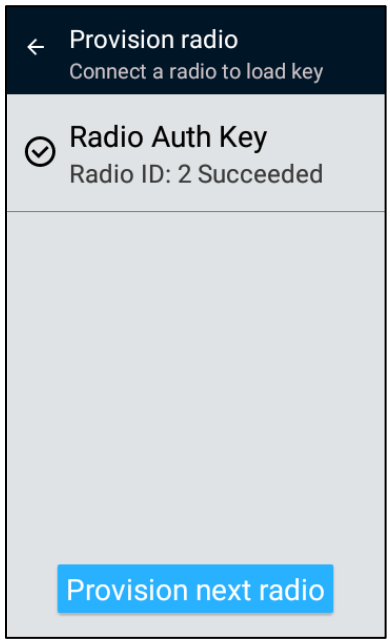






Provision radio with manually entered authentication key.





Next radio may be connected to the KVL and after pressing 'Provision next radio' button KVL application goes to the next screen where a user can enter a key value again.

Loading authentication keys using long press Push to Load (PTL) button

The authentication key loading operation may be quickly started by long press of the PTL button (hold for 3 seconds).

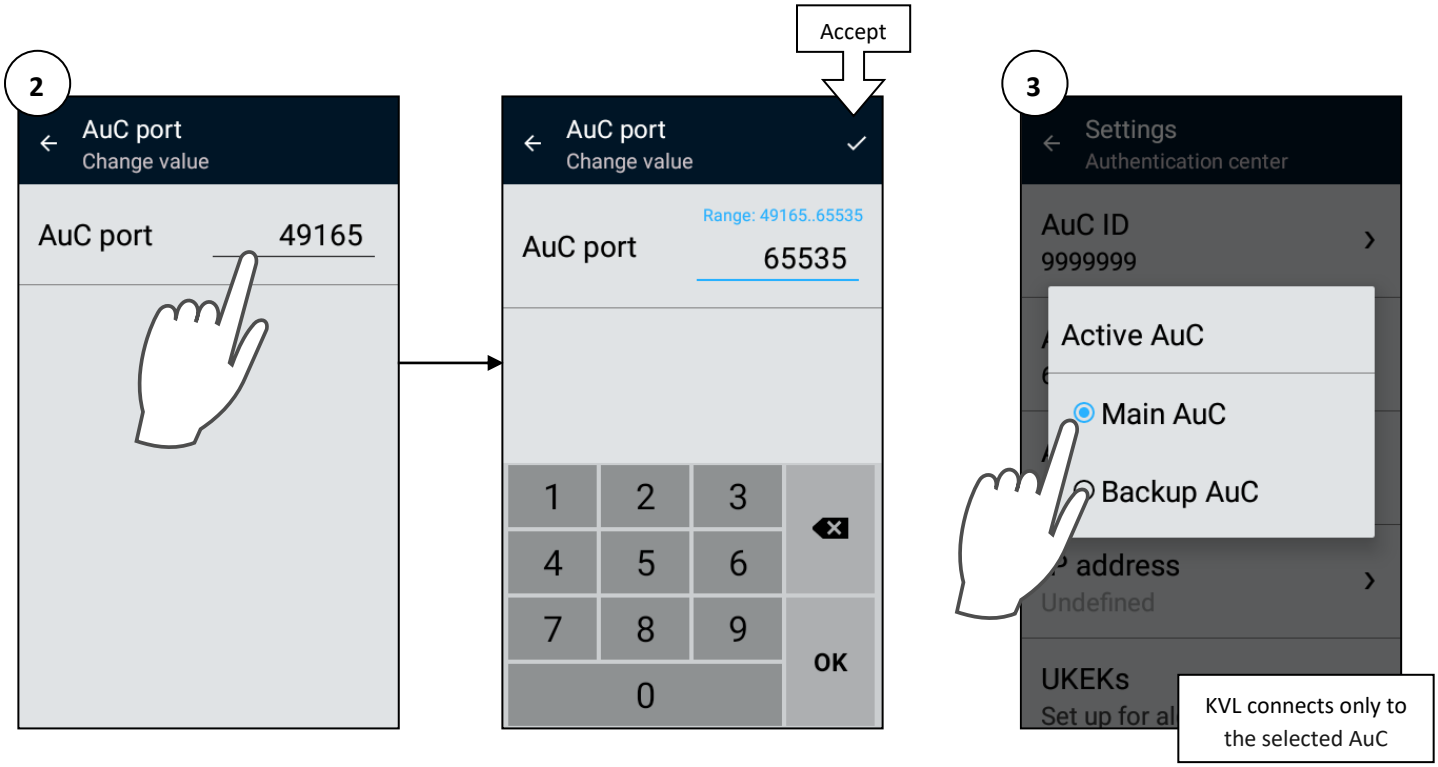
PTL button is disabled if any operation is in progress (for example share keys or upgrade).

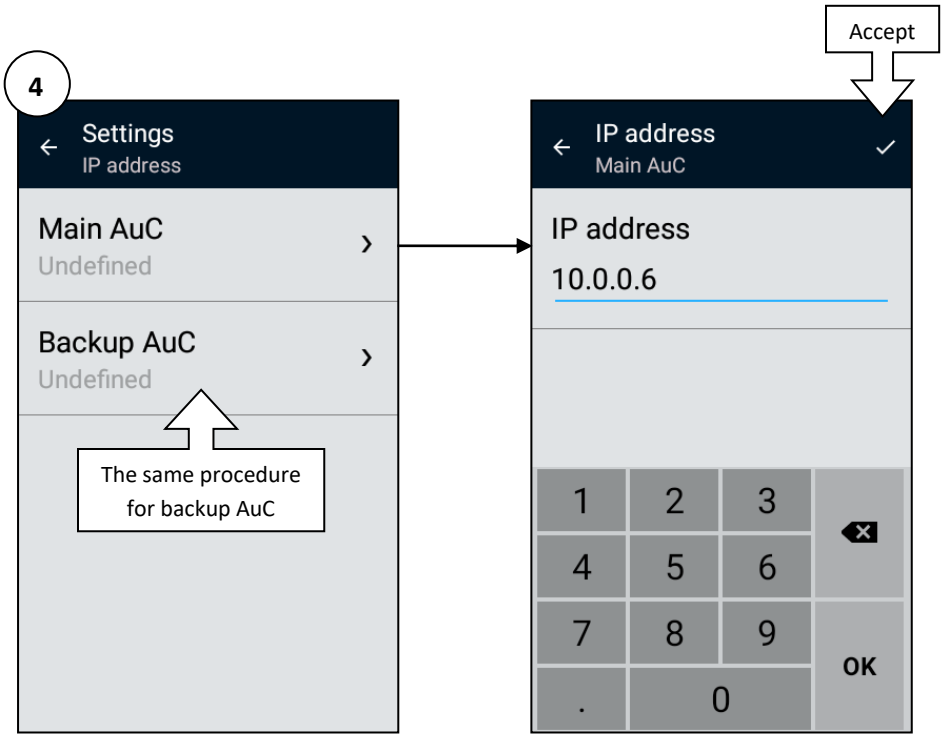
Connect to AuC

AuC Settings (1)

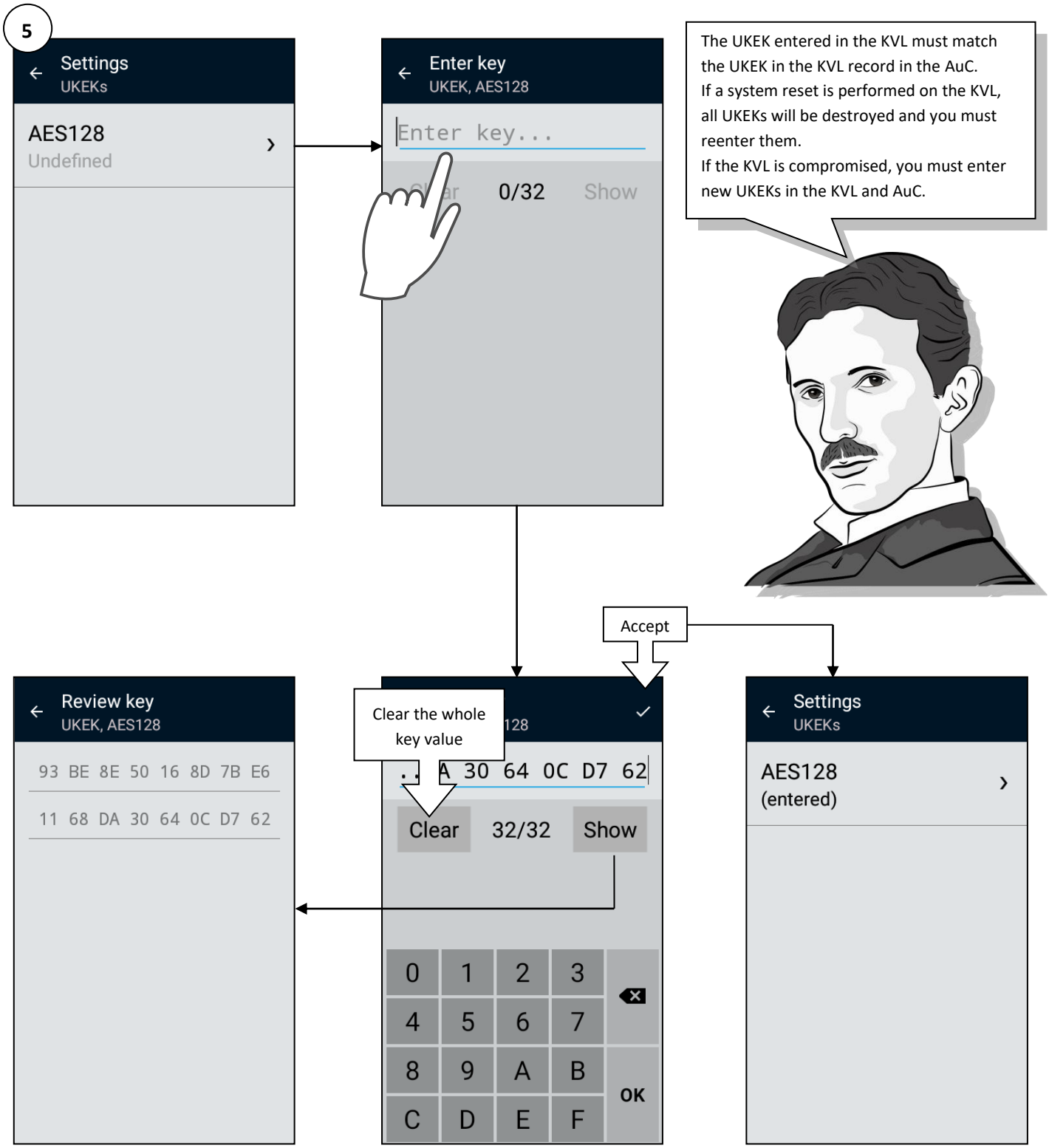
Before using your KVL to work with AuC, you need to program several AuC related parameters.

AuC Settings (2)



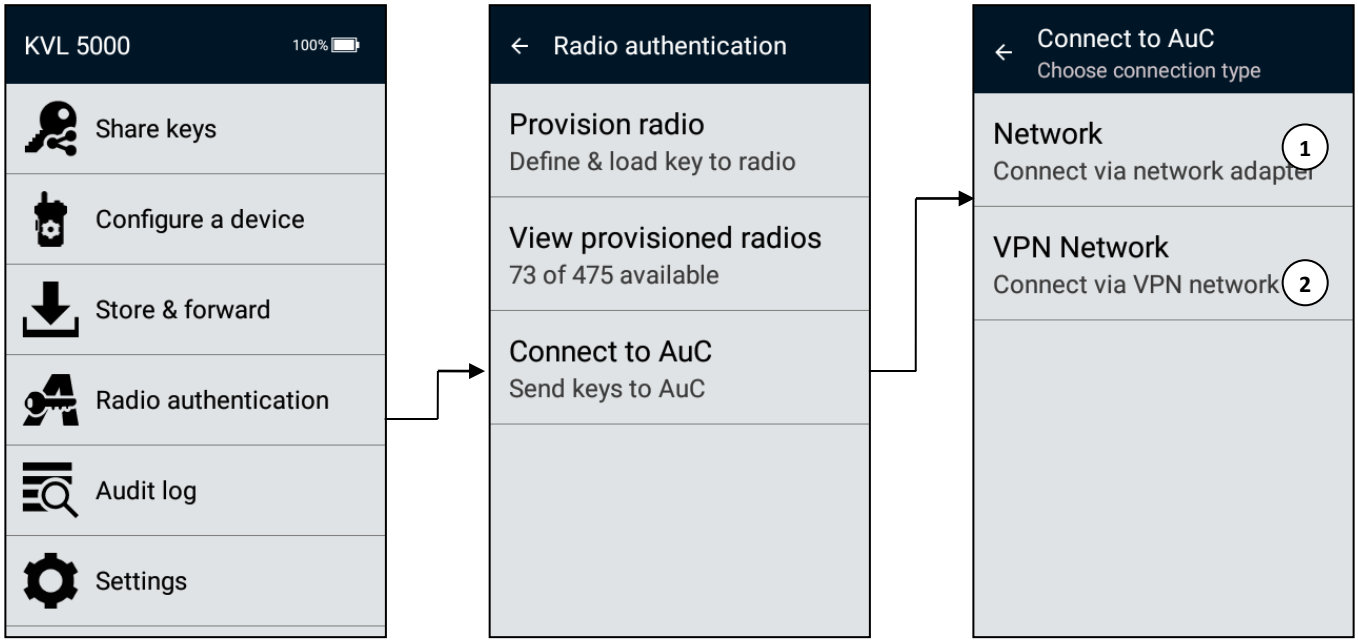


Entering the UKEK

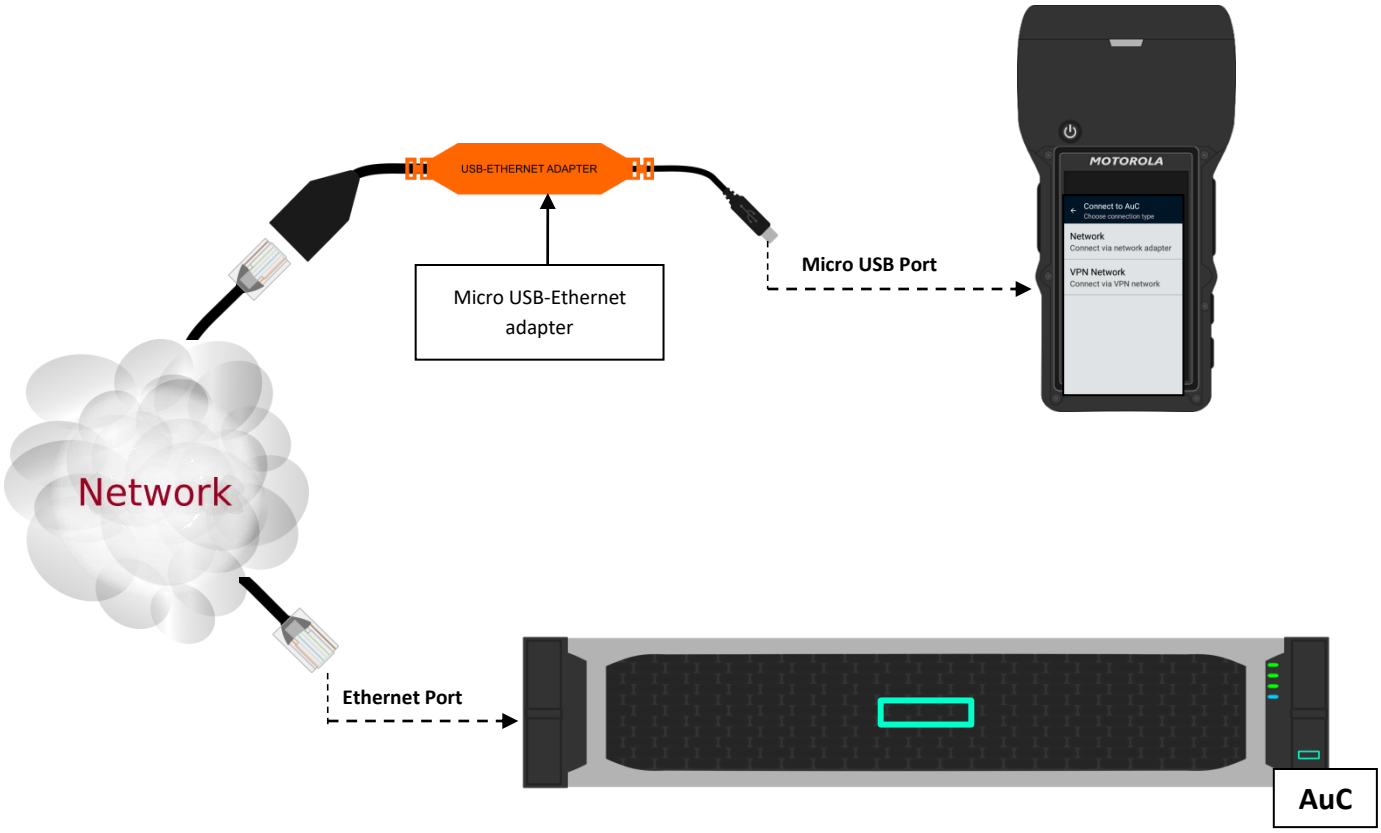


Connect to AuC via Network / VPN Network

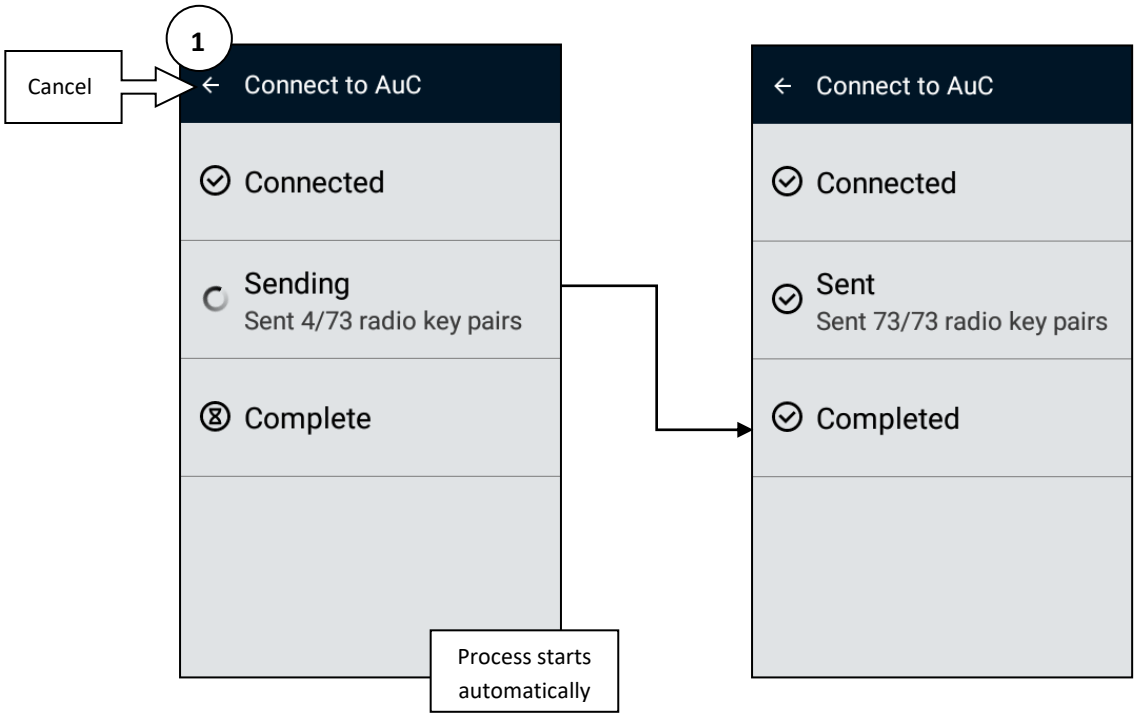
Make sure that the KVL battery is charged.



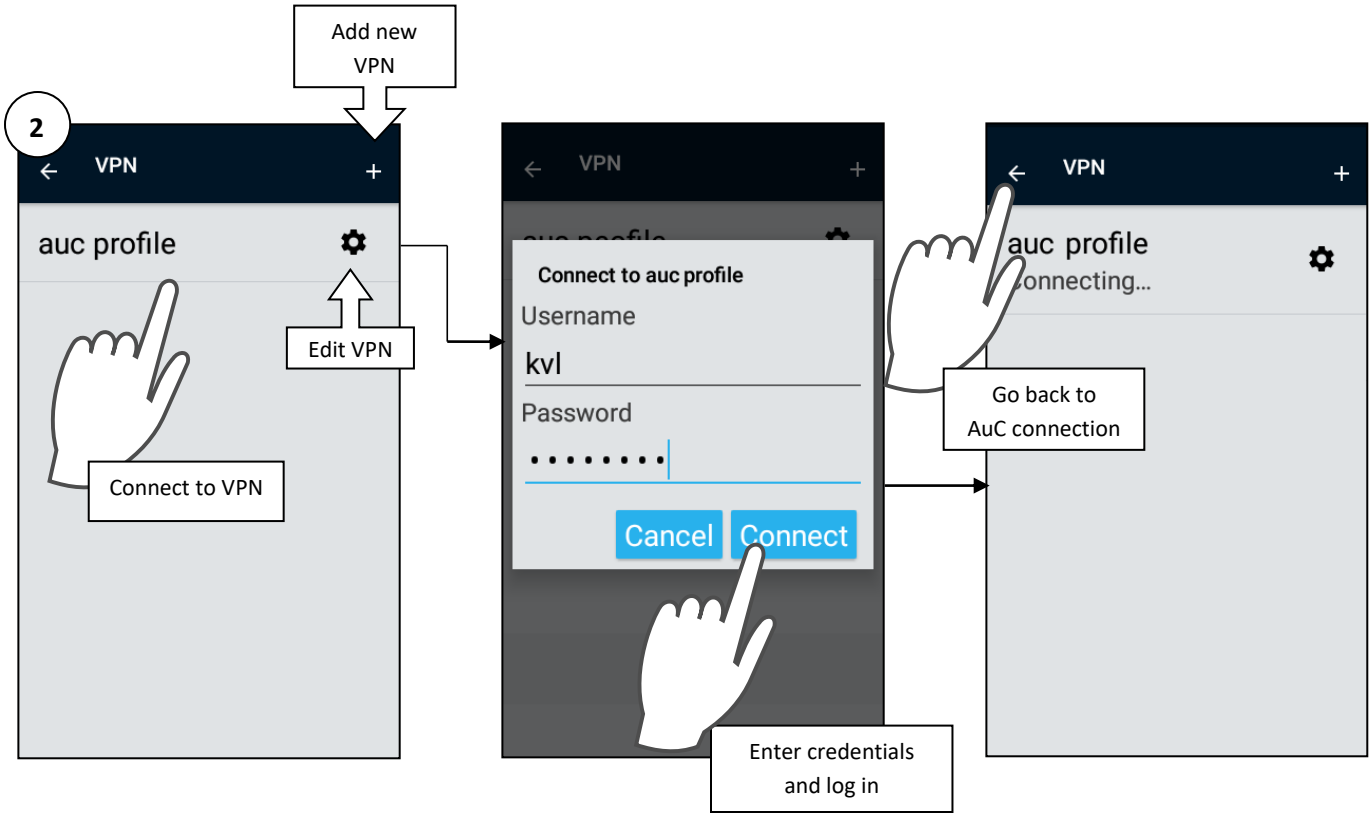
IP address in AuC settings must be set.



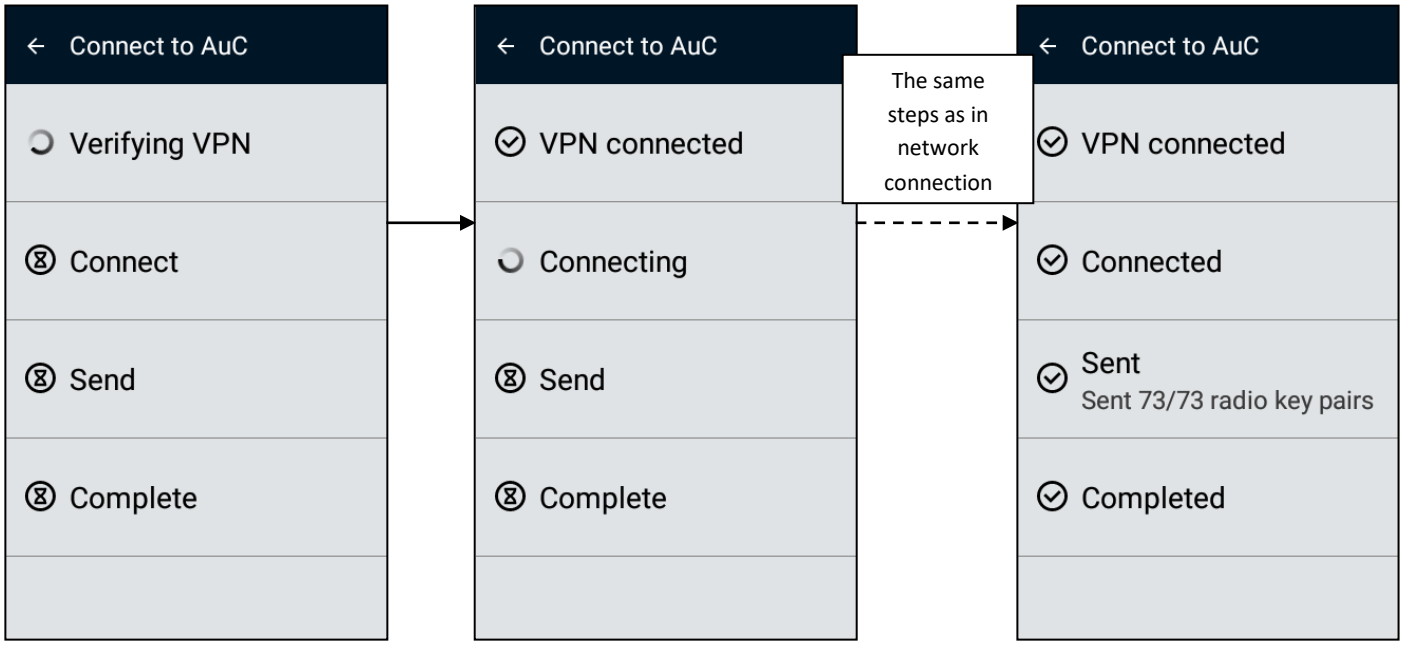
Network connection



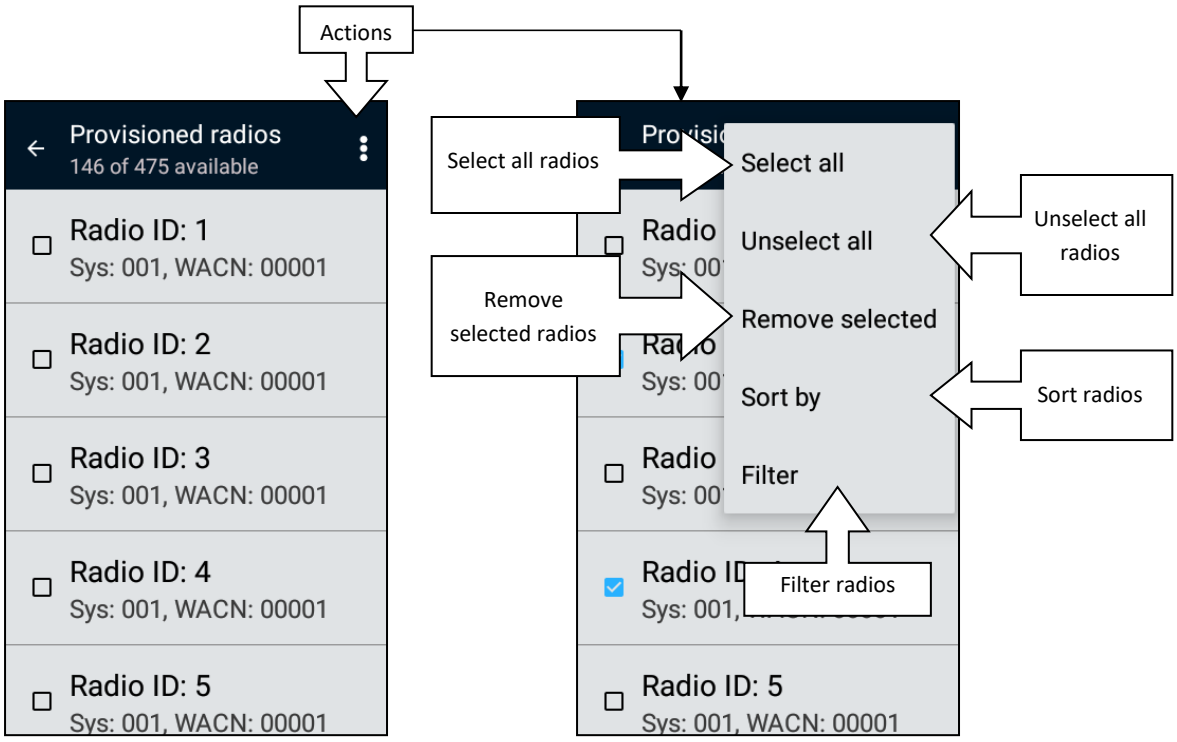
VPN connection (1)



VPN connection (2)

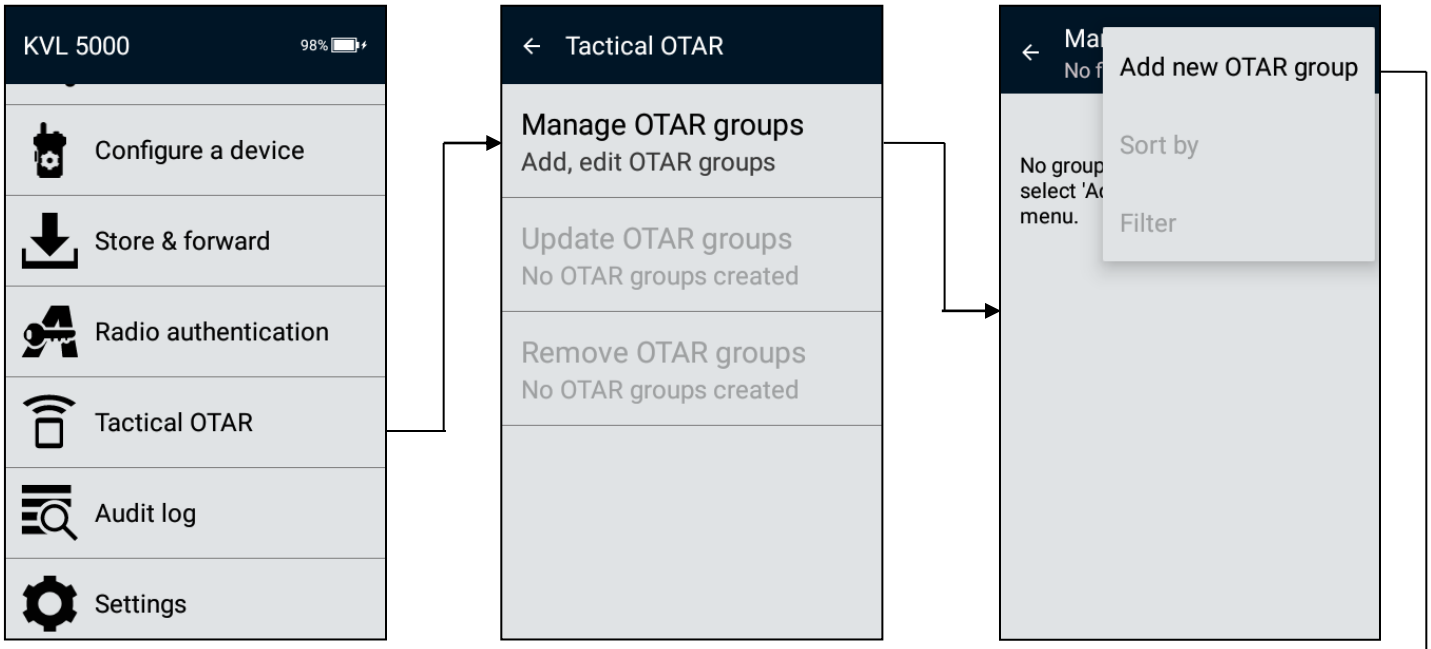


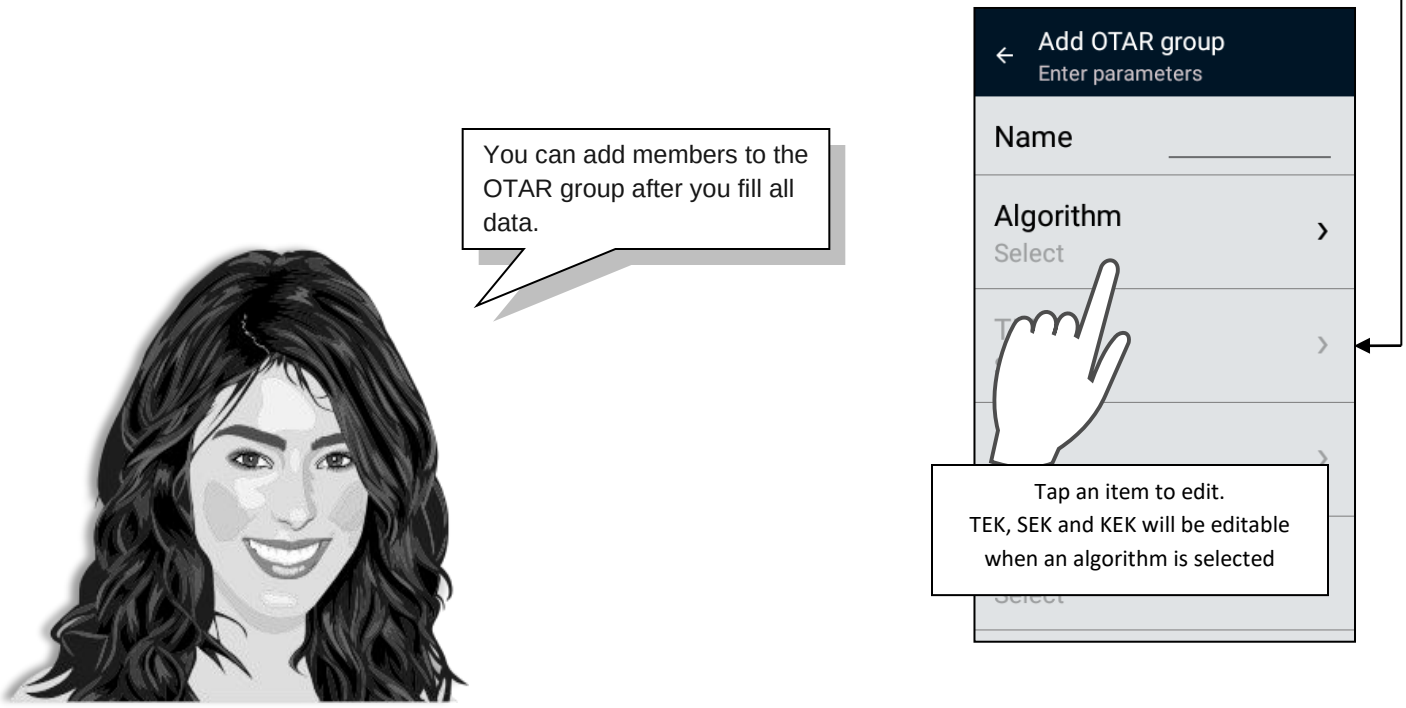
Viewing and removing provisioned radios



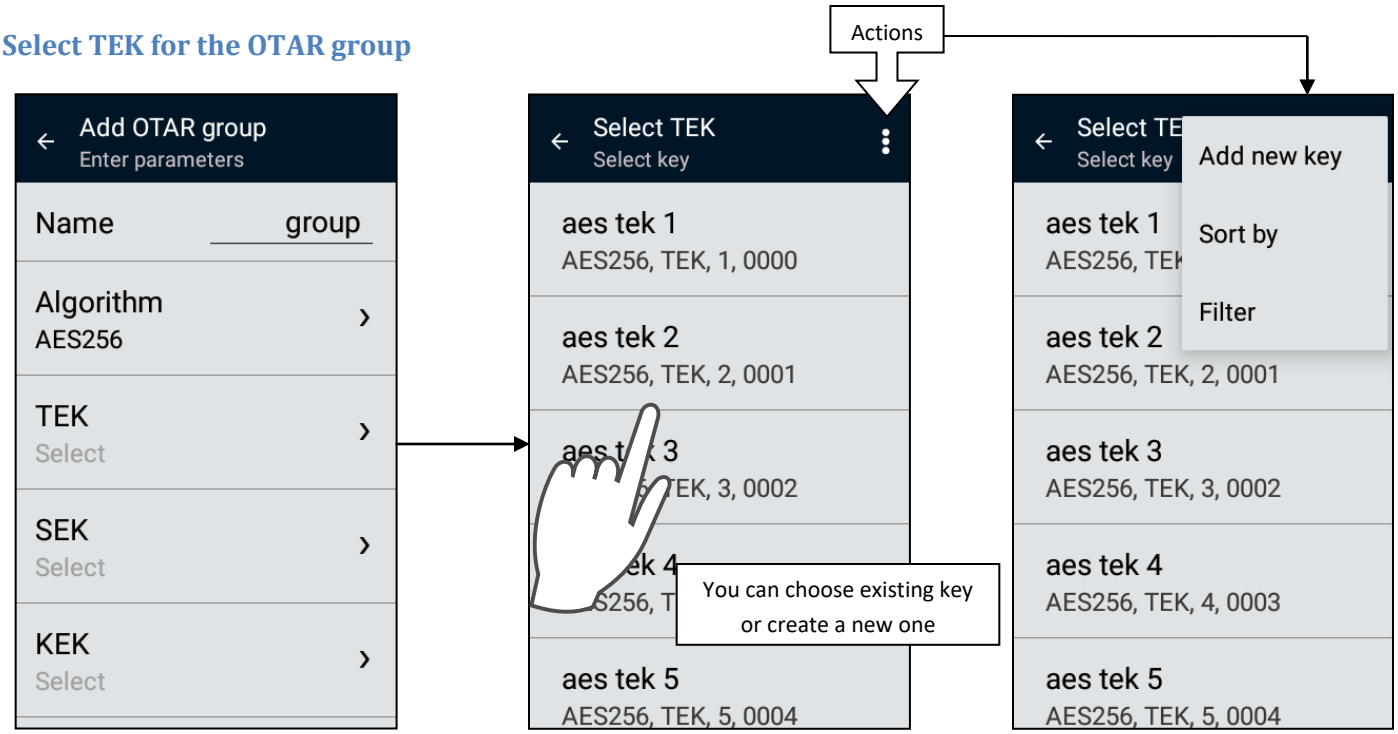
Add new tactical OTAR group

Only administrator can use this feature.

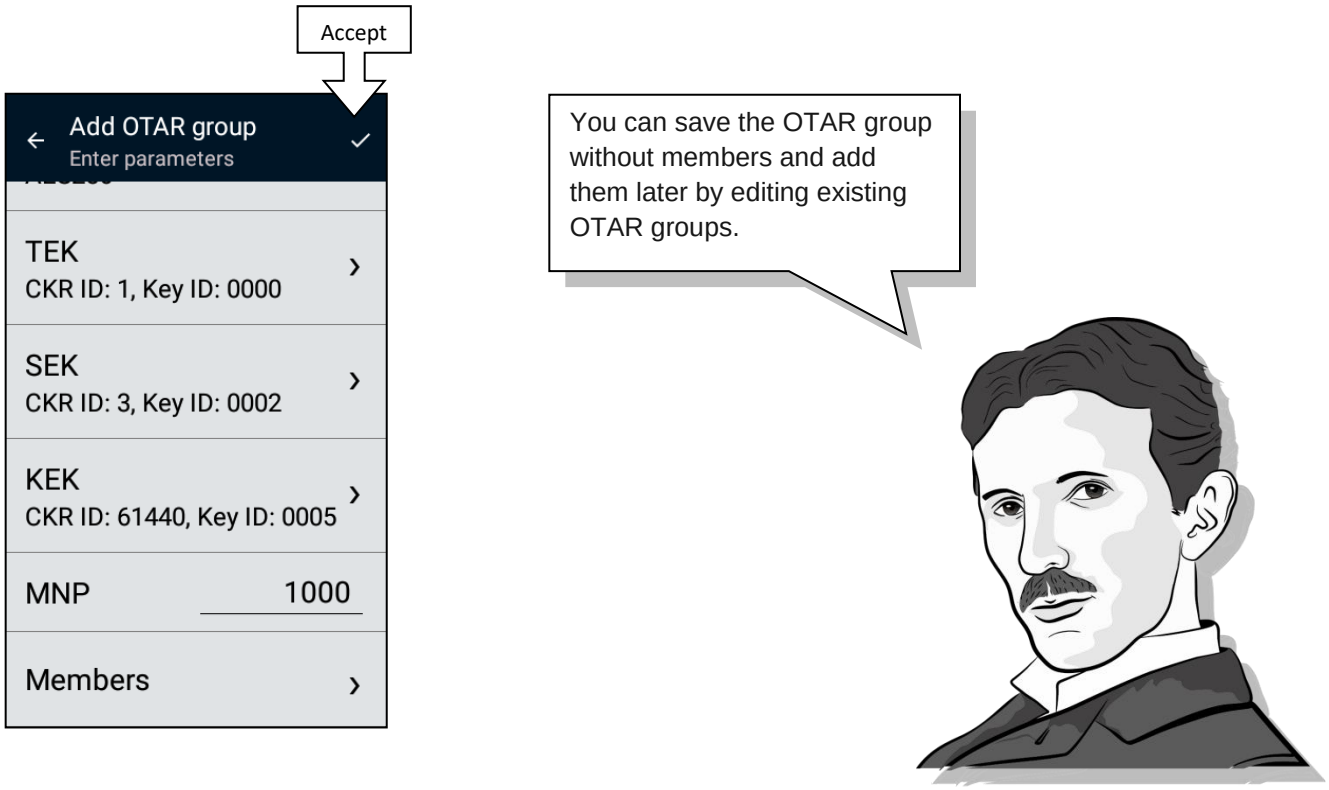




Select TEK for the OTAR group



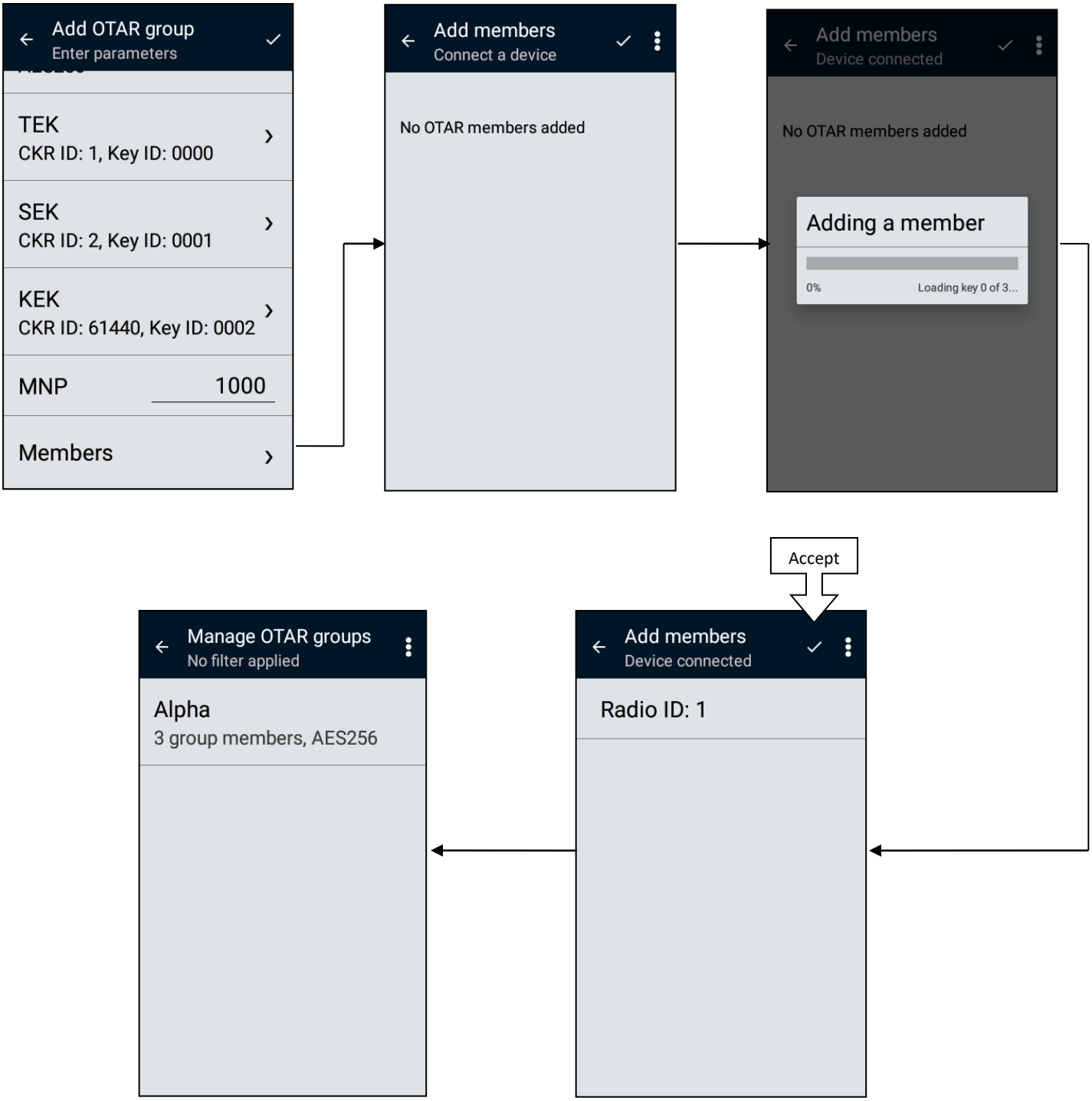
The same procedure is for selecting SEK and KEK.



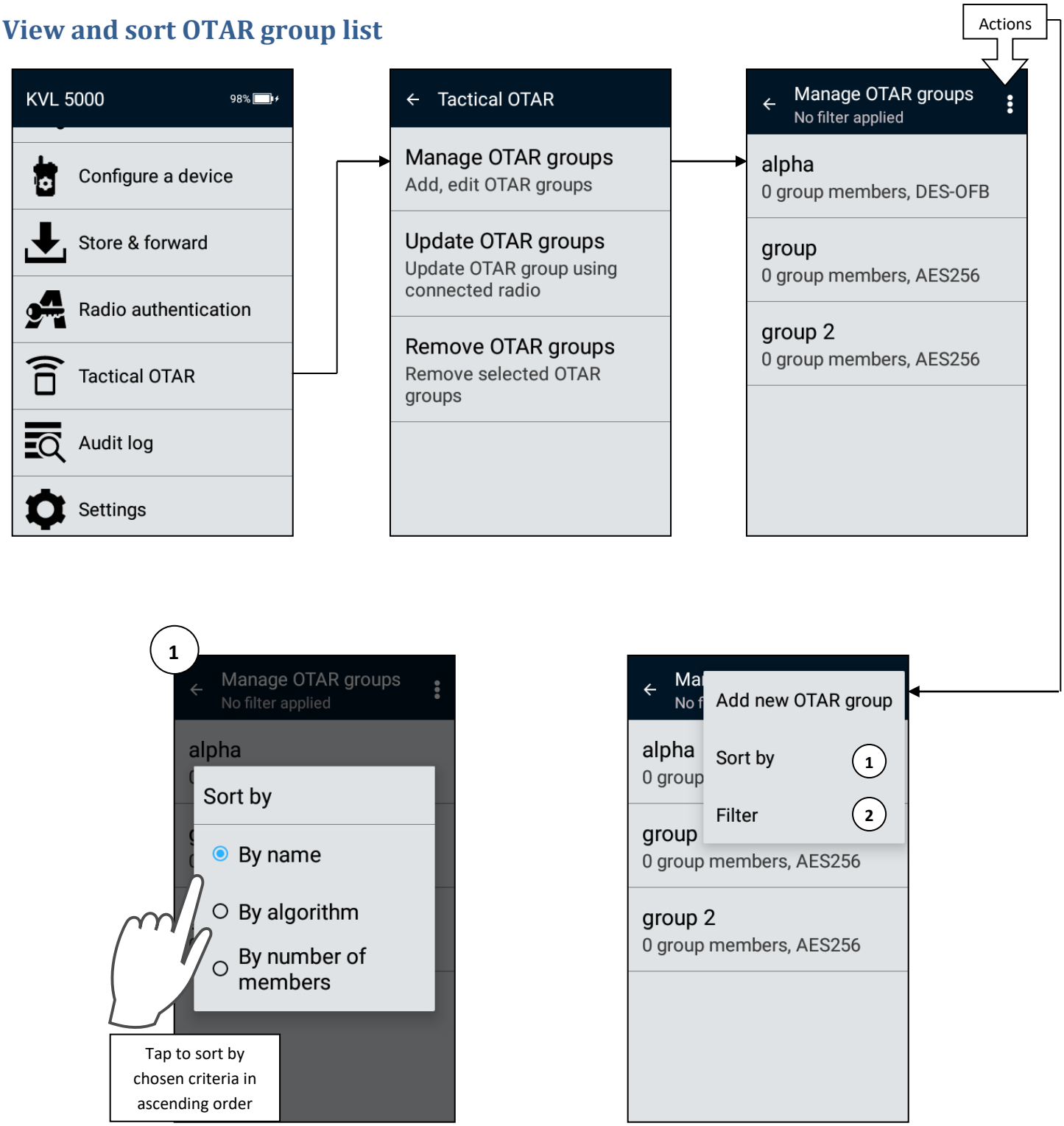
Adding new members to OTAR group (1)

To add radios to OTAR group connect each one to provision them with TEK, KEK and SEK. Single group can contain up to 50 members.

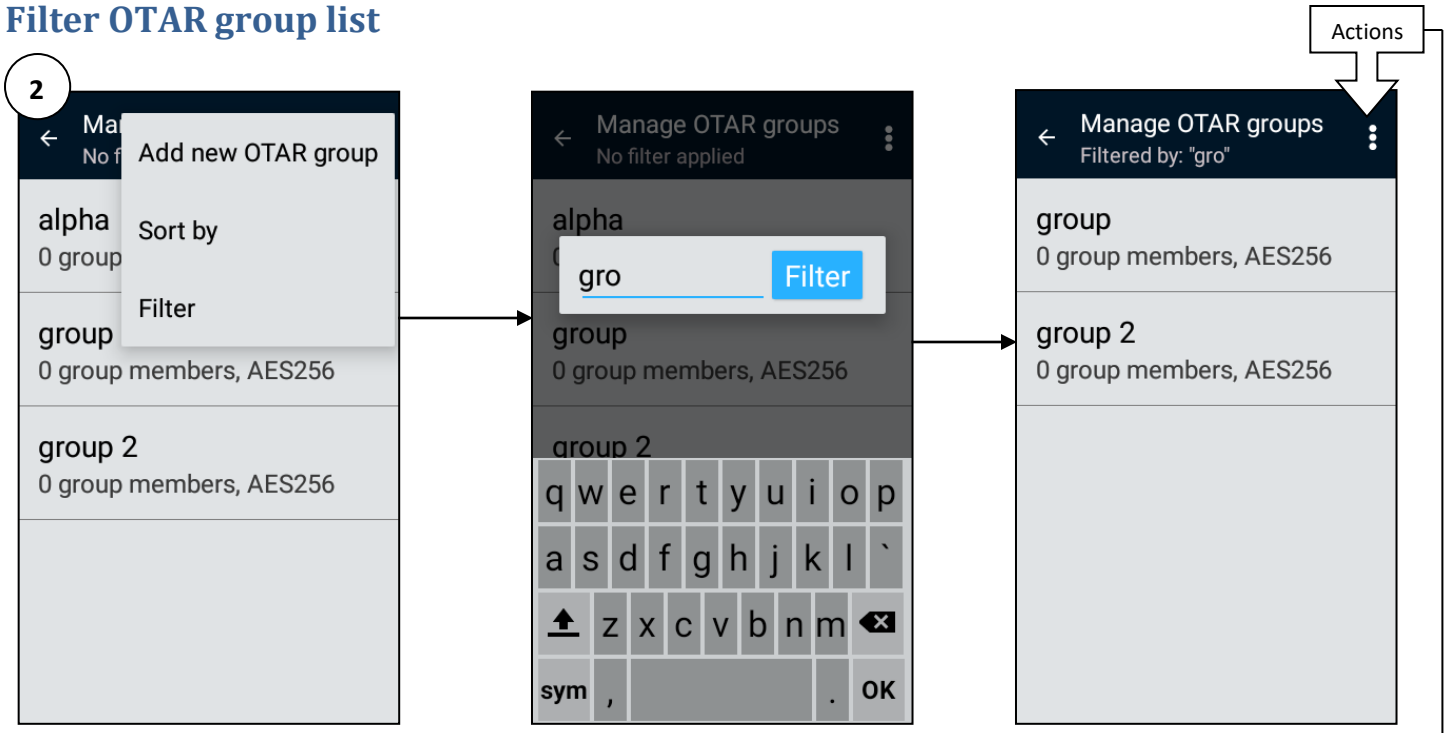
Adding new members to OTAR group (2)

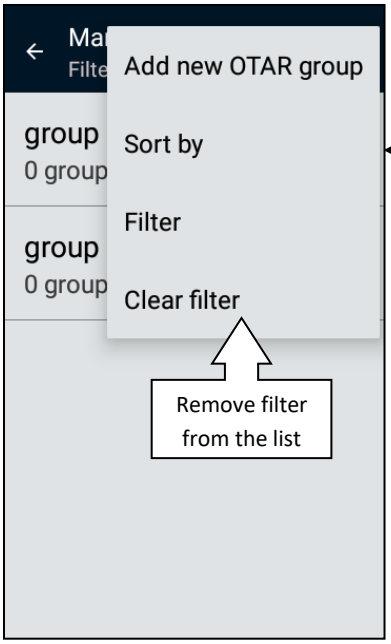


View and sort OTAR group list



Filter OTAR group list



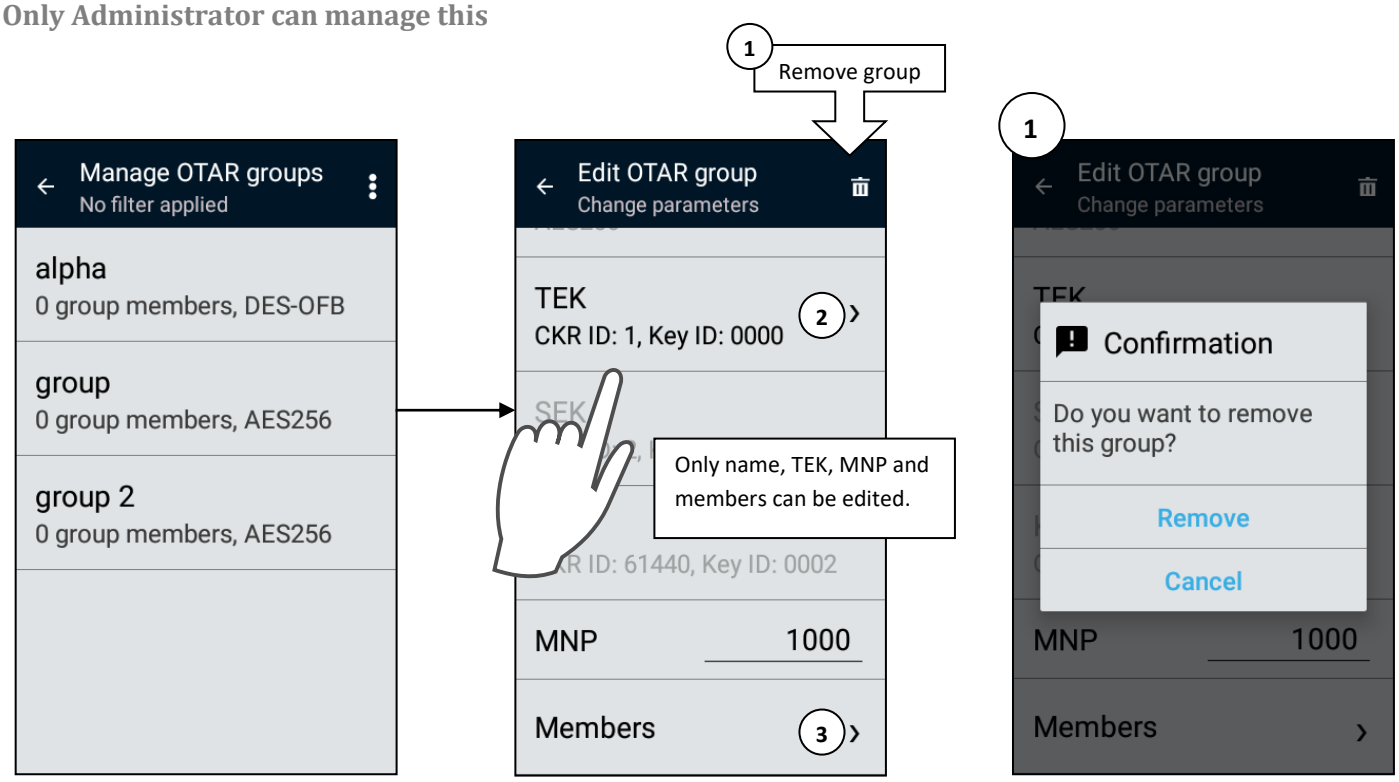


To search for an item, type in the name, algorithm or members count in the filter dialog. You do not need to enter the entire text, only the beginning.

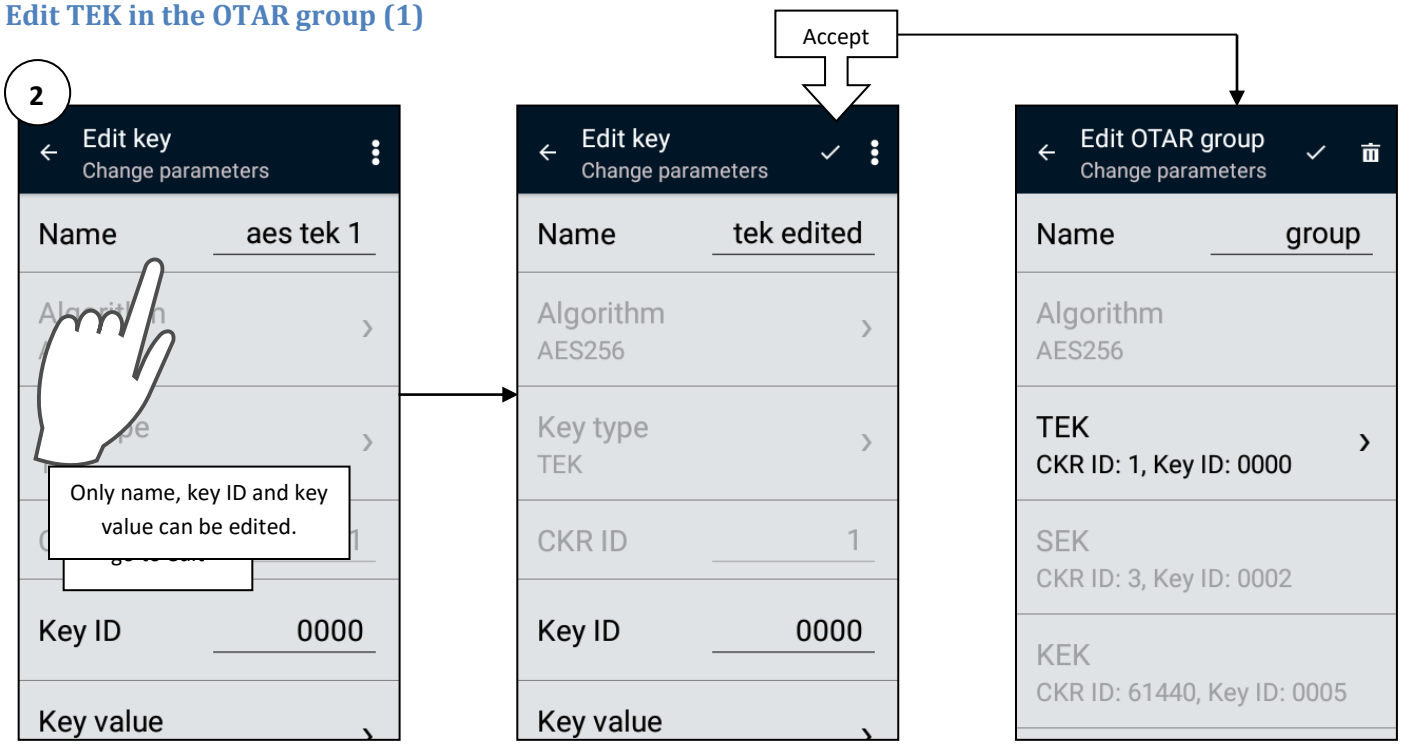
Edit OTAR group

Edit OTAR group name, TEK, MNP and members | Delete the group |

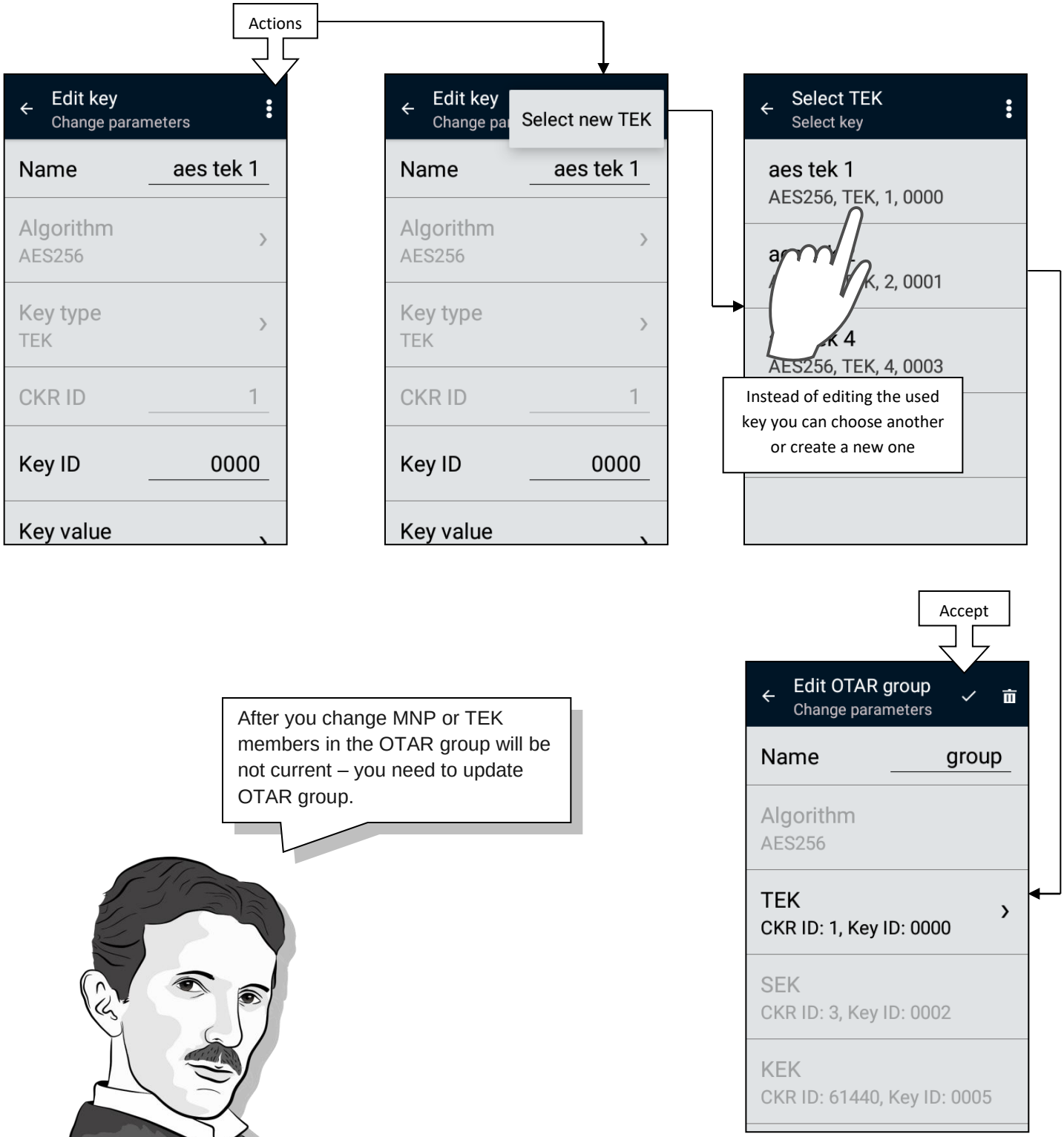
Only Administrator can manage this



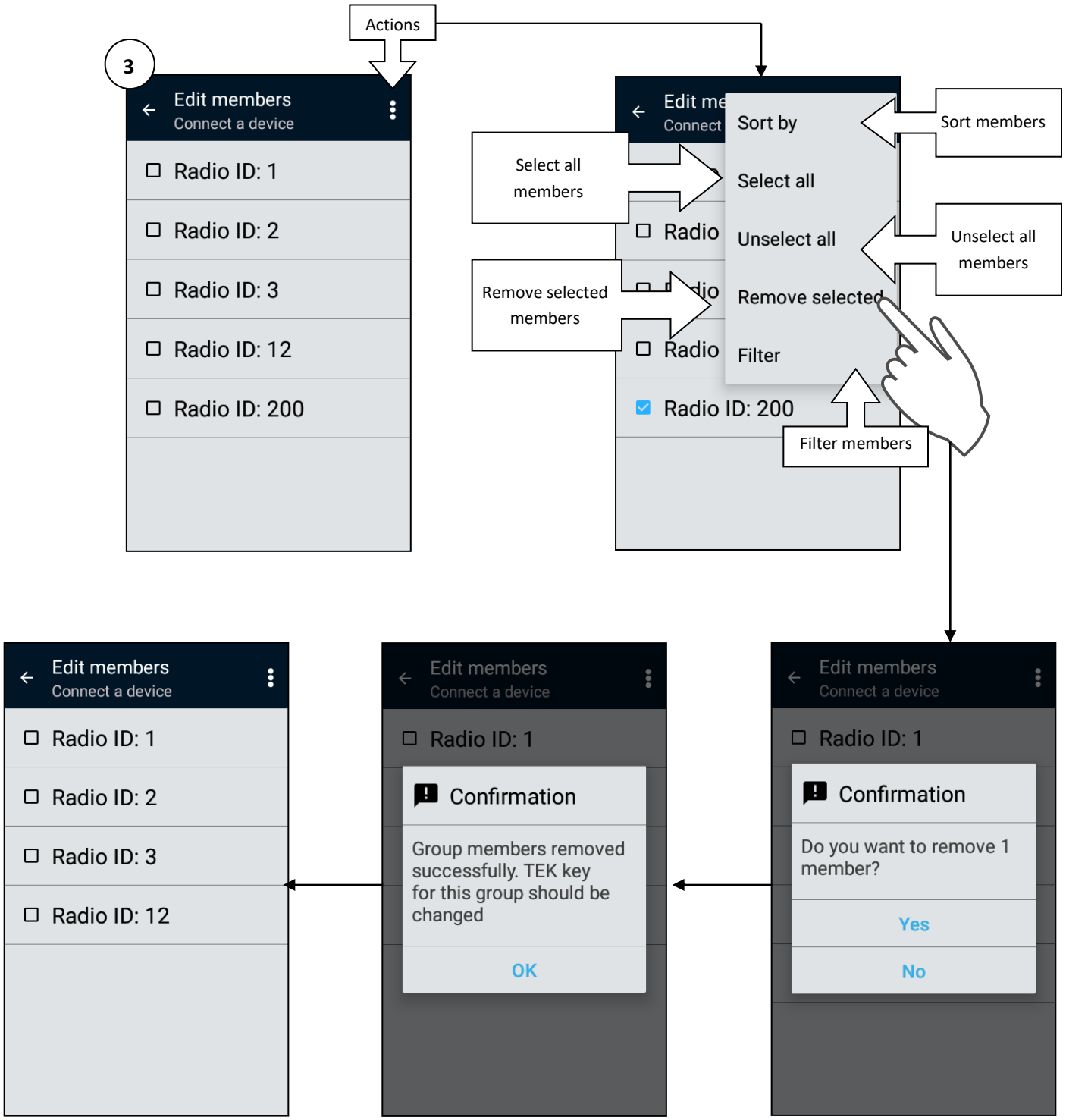
Edit TEK in the OTAR group (1)



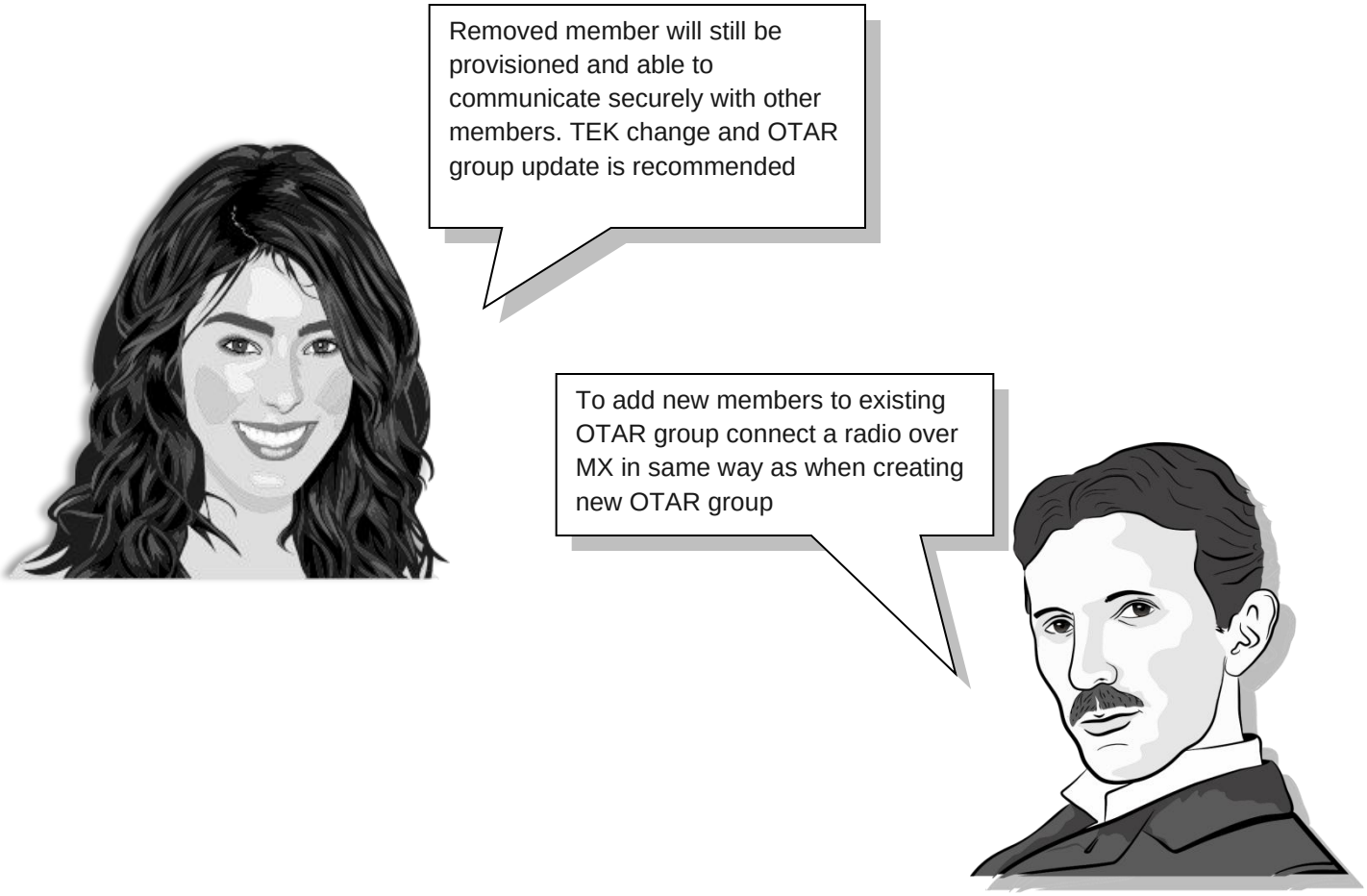
Edit TEK in the OTAR group (2)

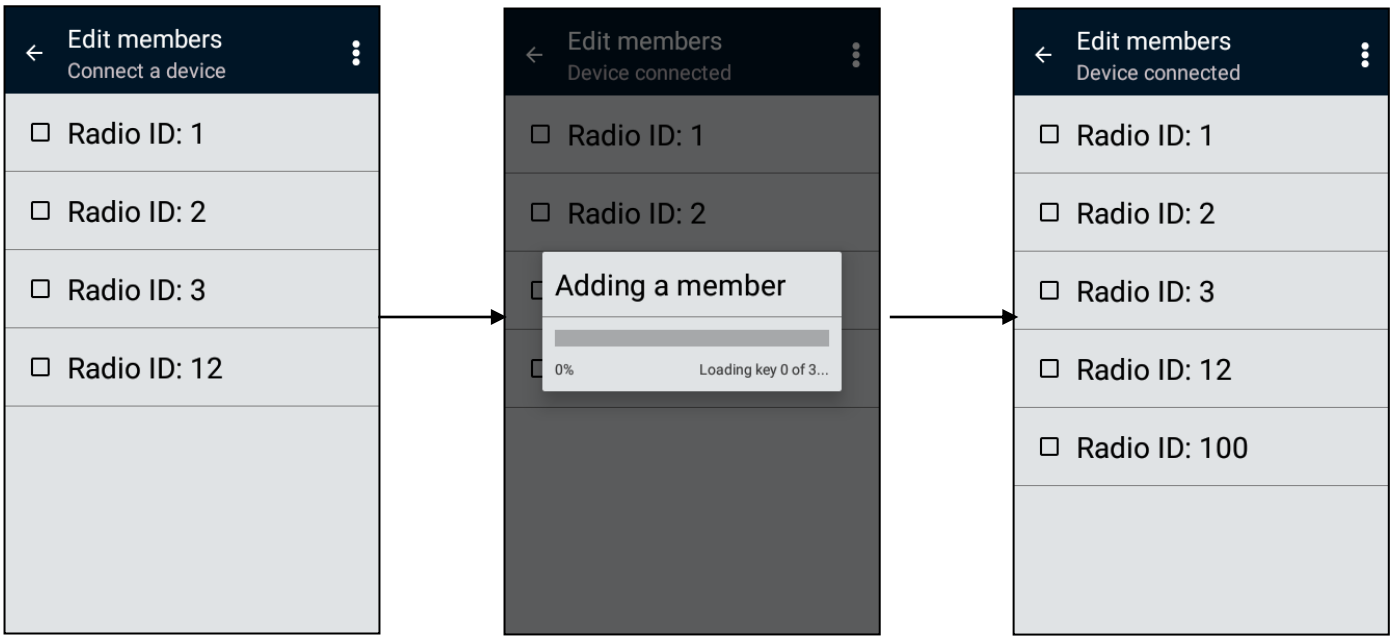


Edit members in the OTAR group (1)



Edit members in the OTAR group (2)





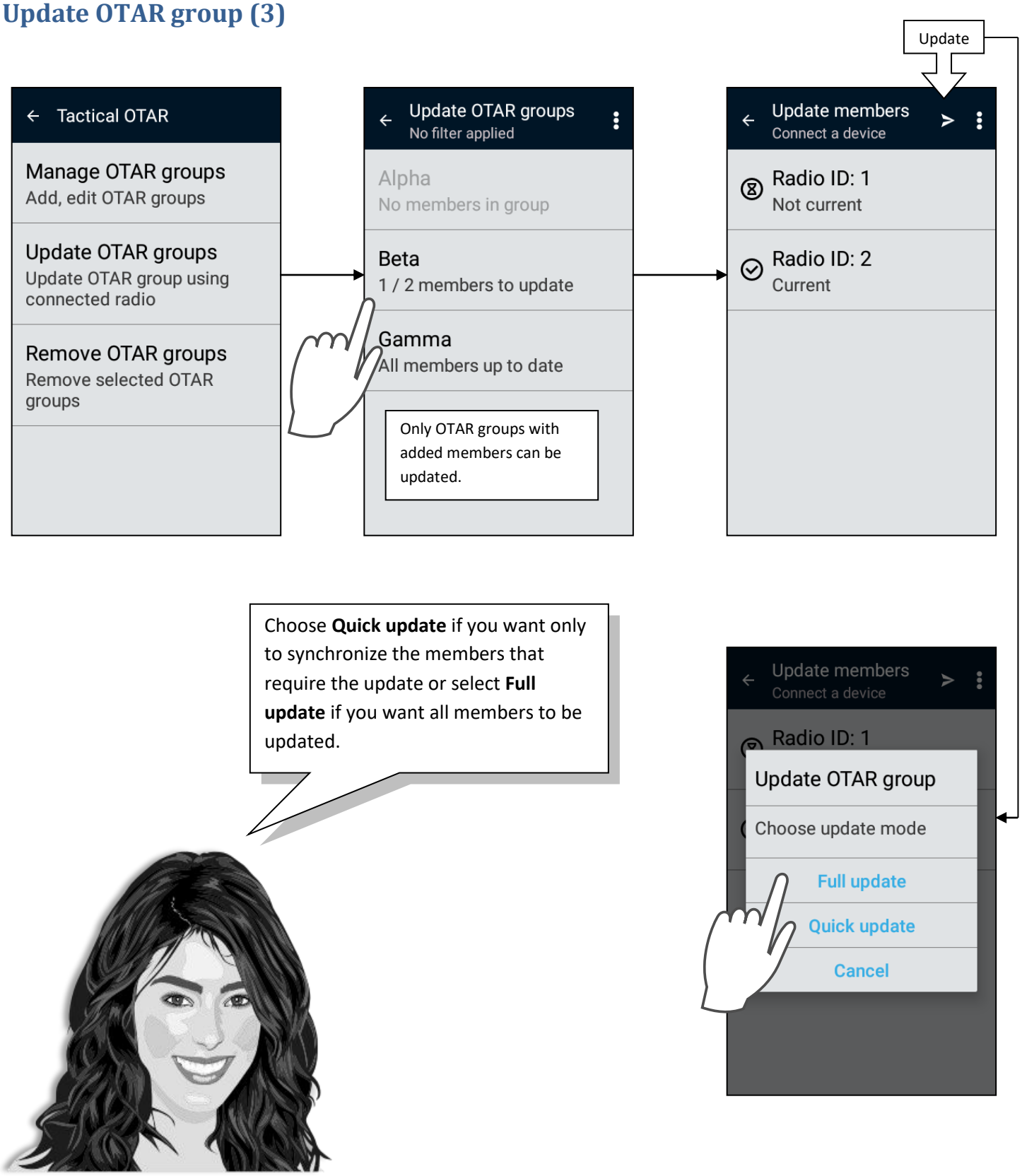
Update OTAR group (1)

Tactical OTAR is a Motorola feature that allows a KVL to wirelessly manage a key (TEK only) for a small group of radios, with one radio serving as an RF modem. The radio serving as an RF modem must be equipped with the Tactical Rekey/OTAR feature. The OTAR group update is executed using RS-232 or USB cable.

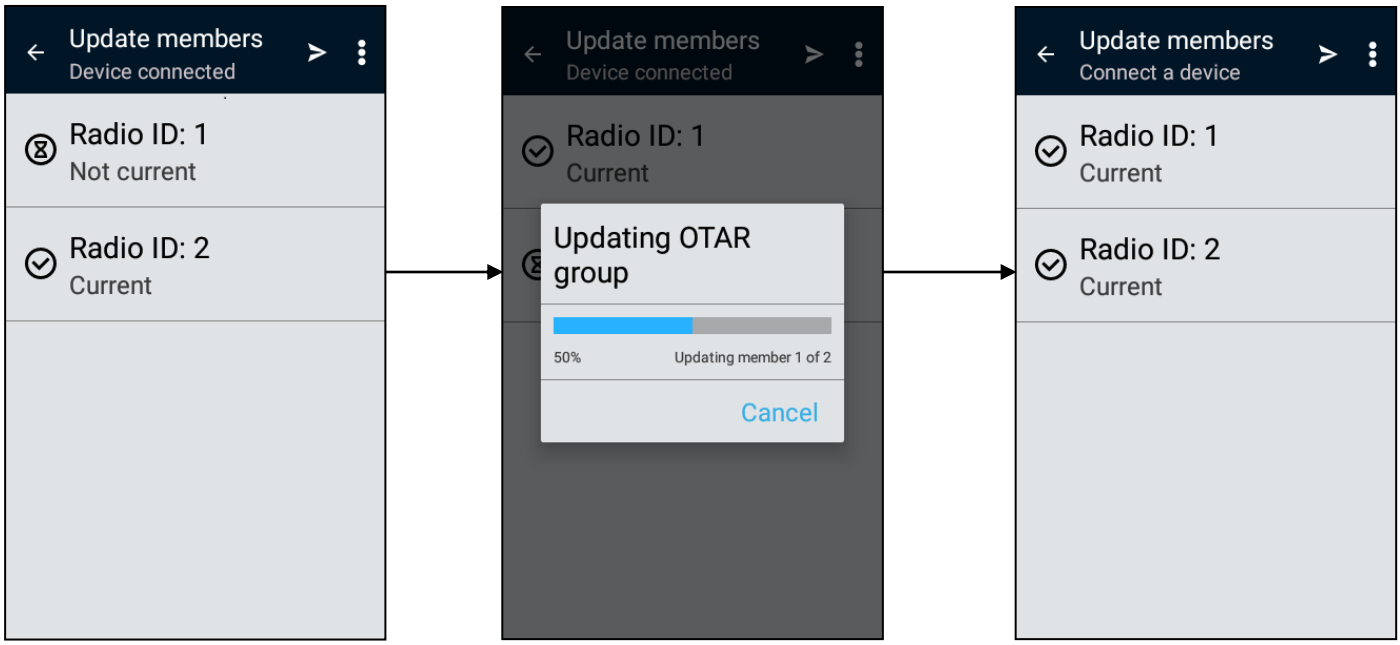
Update OTAR group (2)

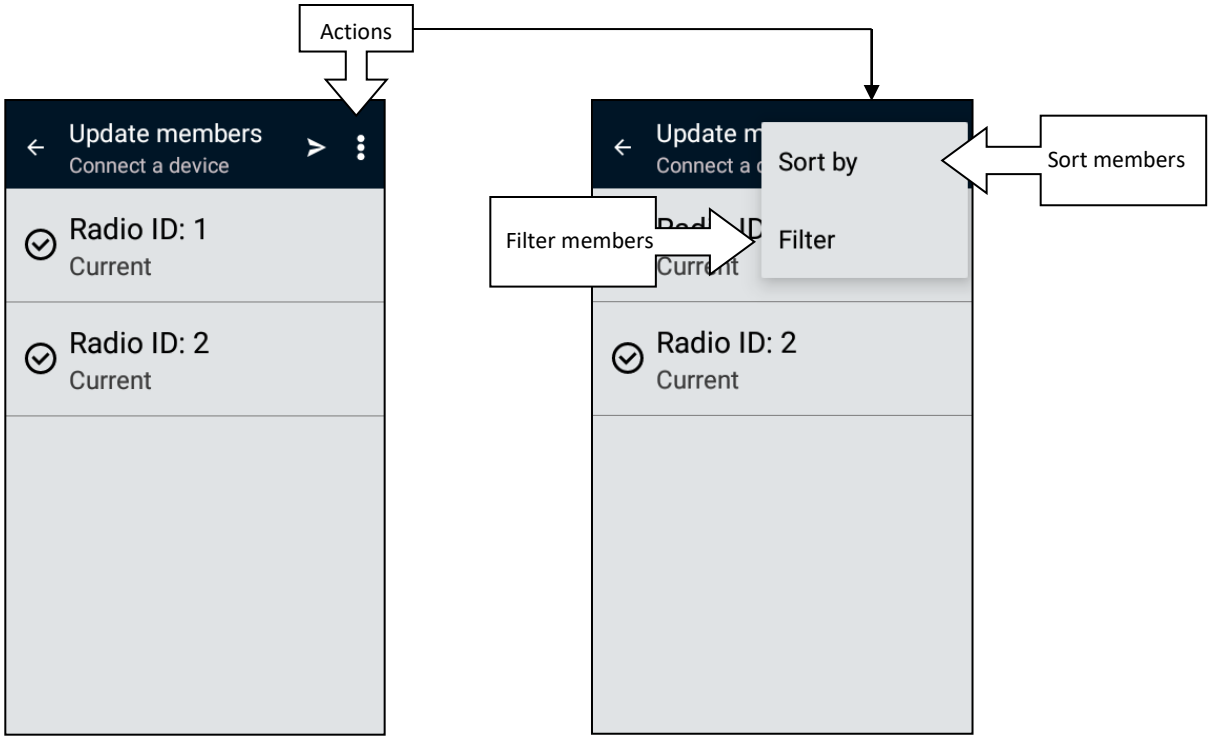
You can also connect devices over USB to update OTAR group when USB key loading feature is enabled.

Update OTAR group (3)



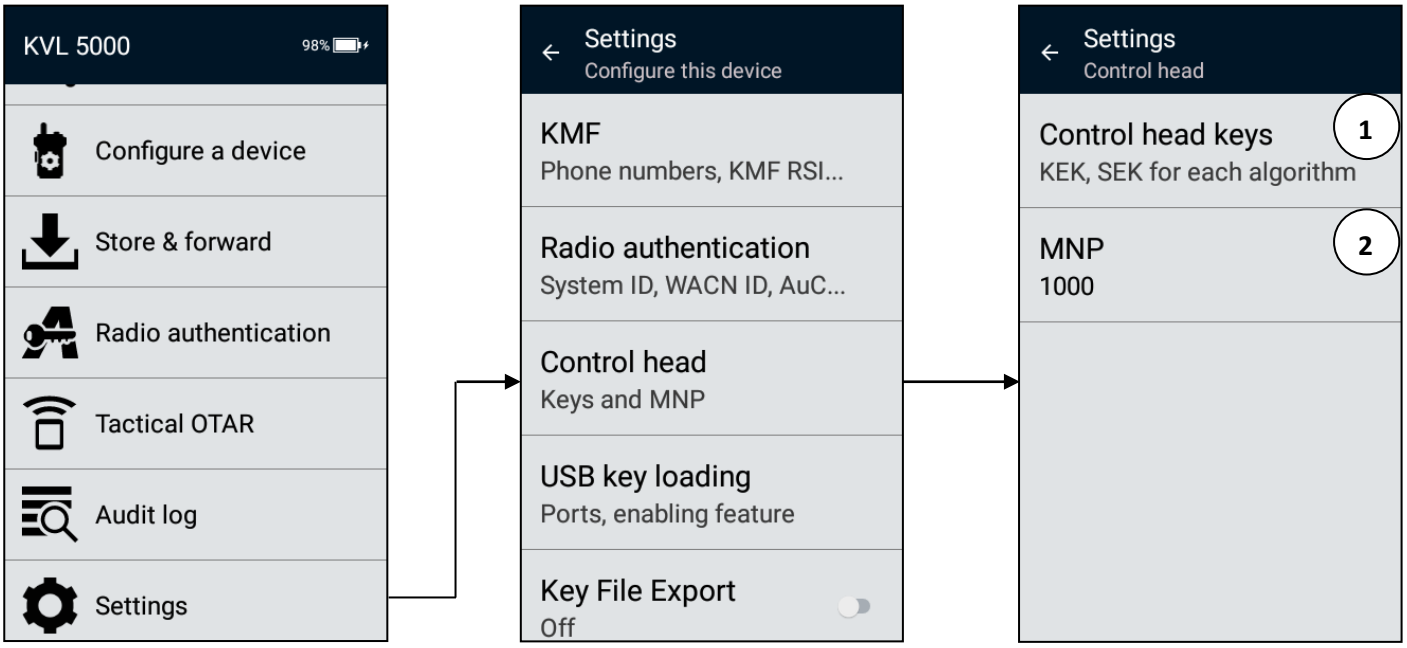
Update OTAR group (4)

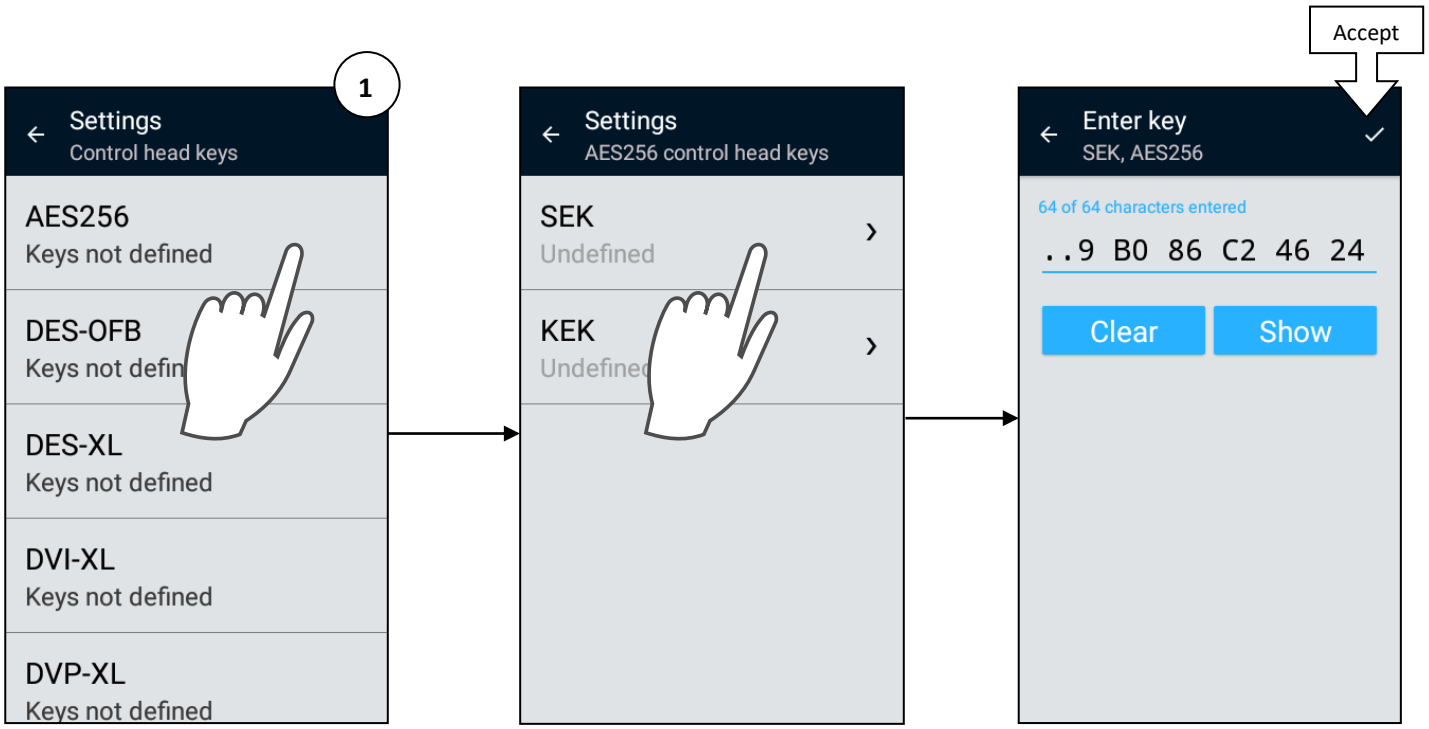




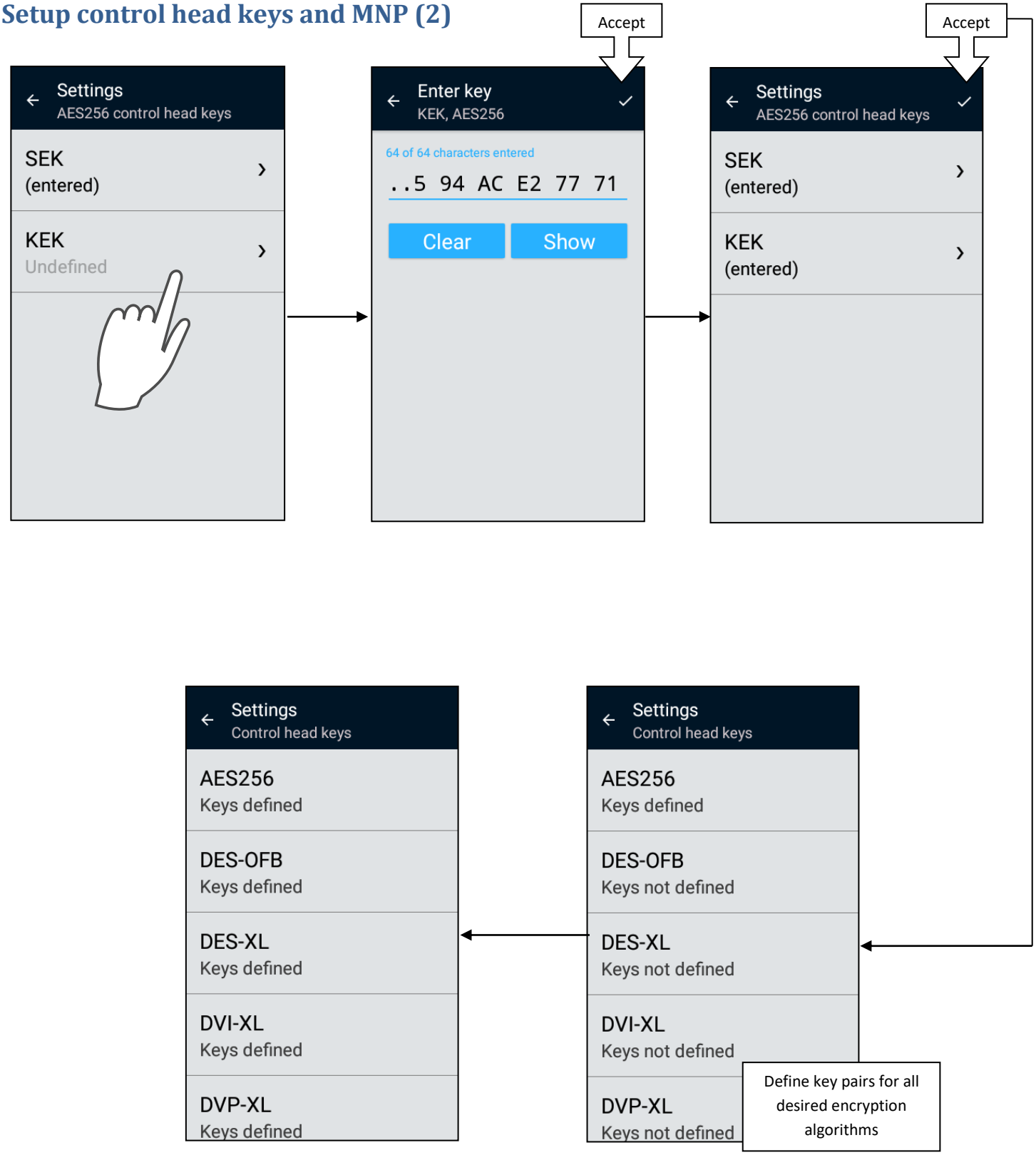
Setup control head keys and MNP (1)

Sometimes the radio may be mounted in a vehicle's trunk and is difficult to access. Remote control head feature allows you to load and manage keys on a radio through a remote control head that can be mounted in vehicle's cabin.

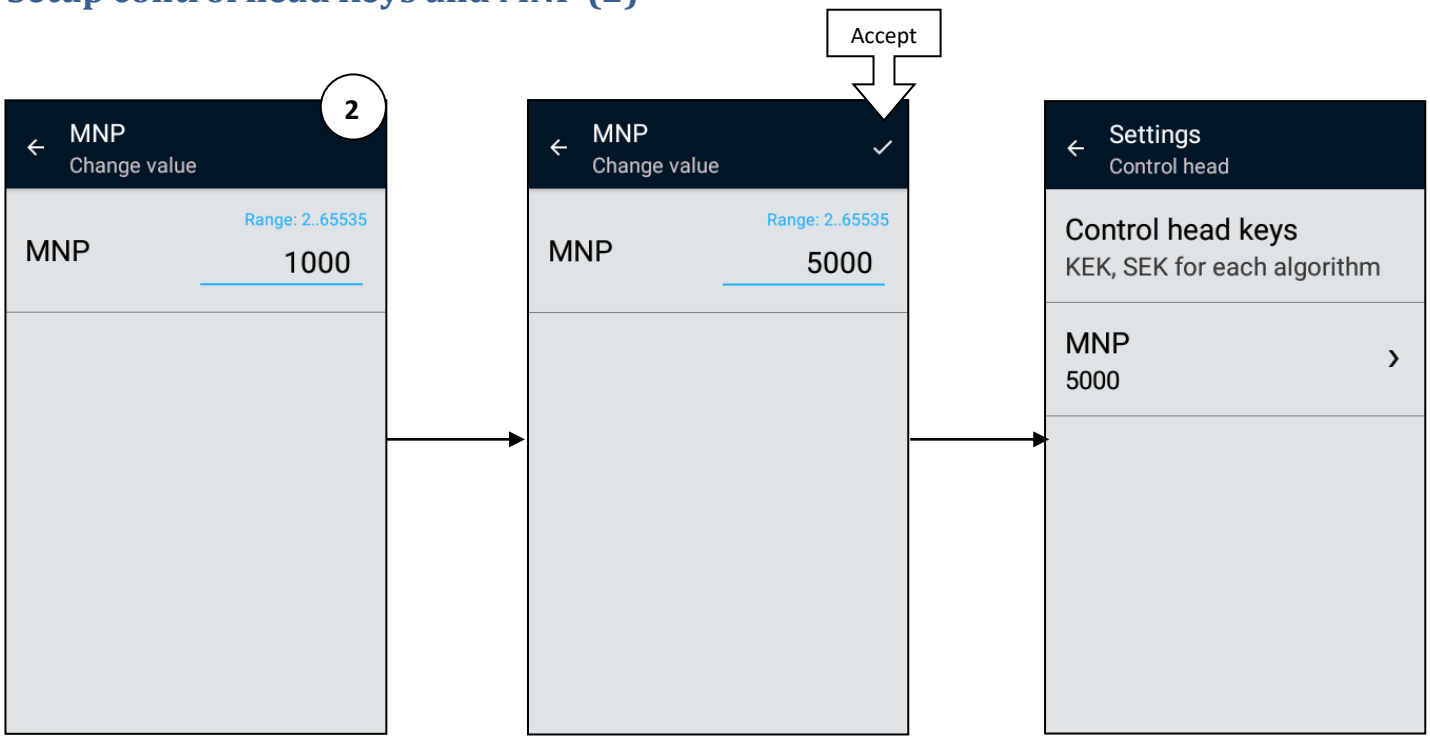




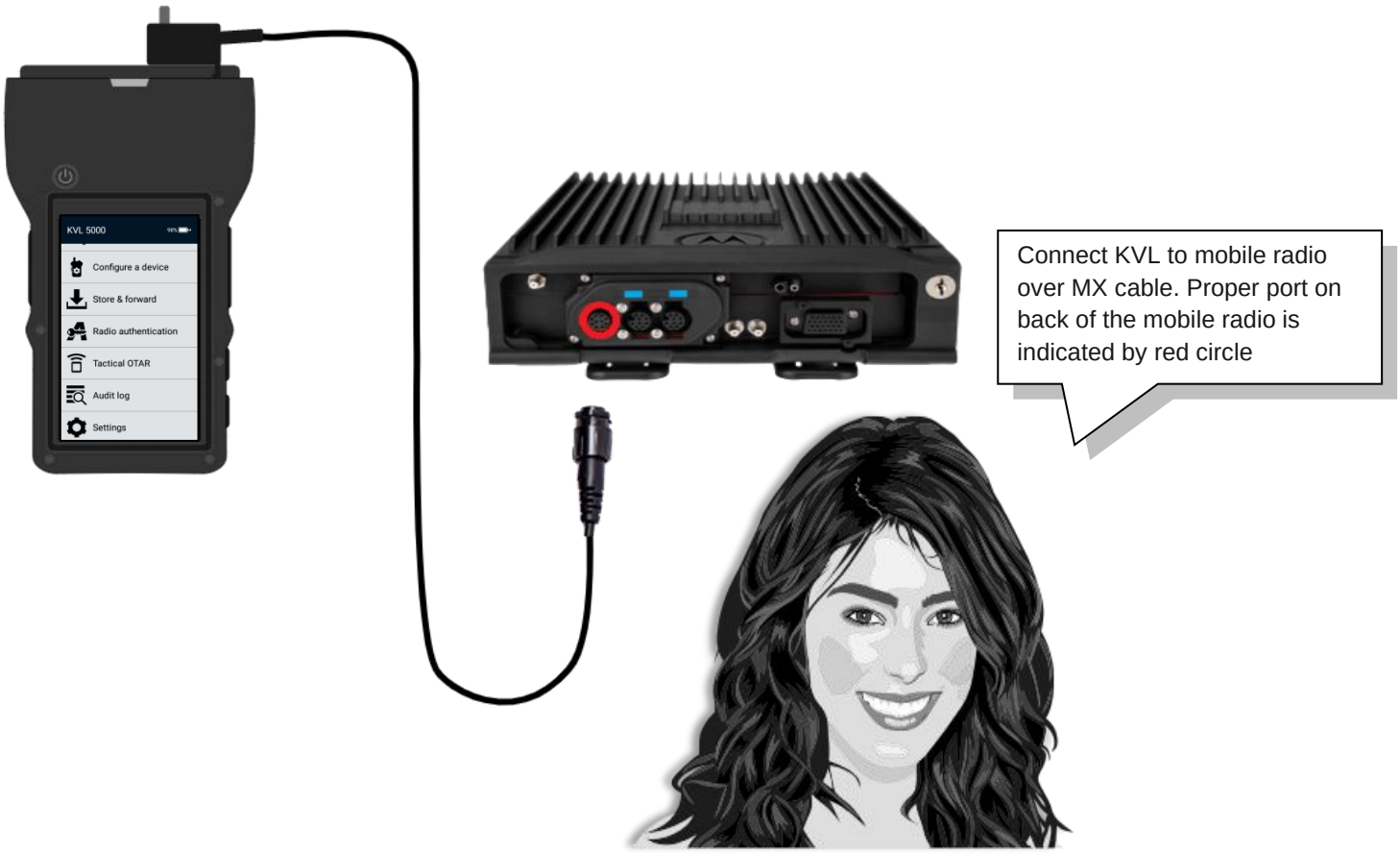
Setup control head keys and MNP (2)



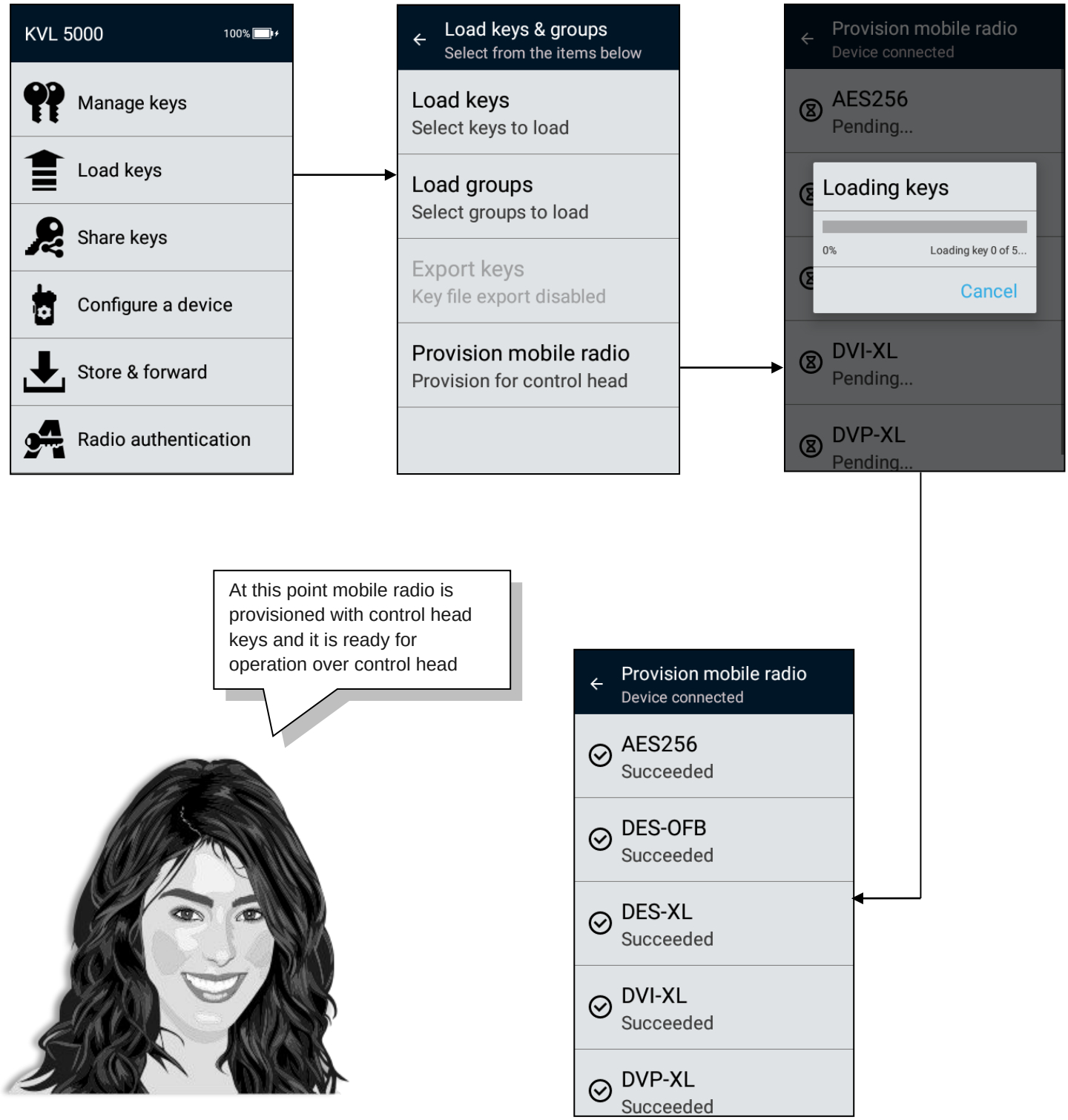
Setup control head keys and MNP (2)



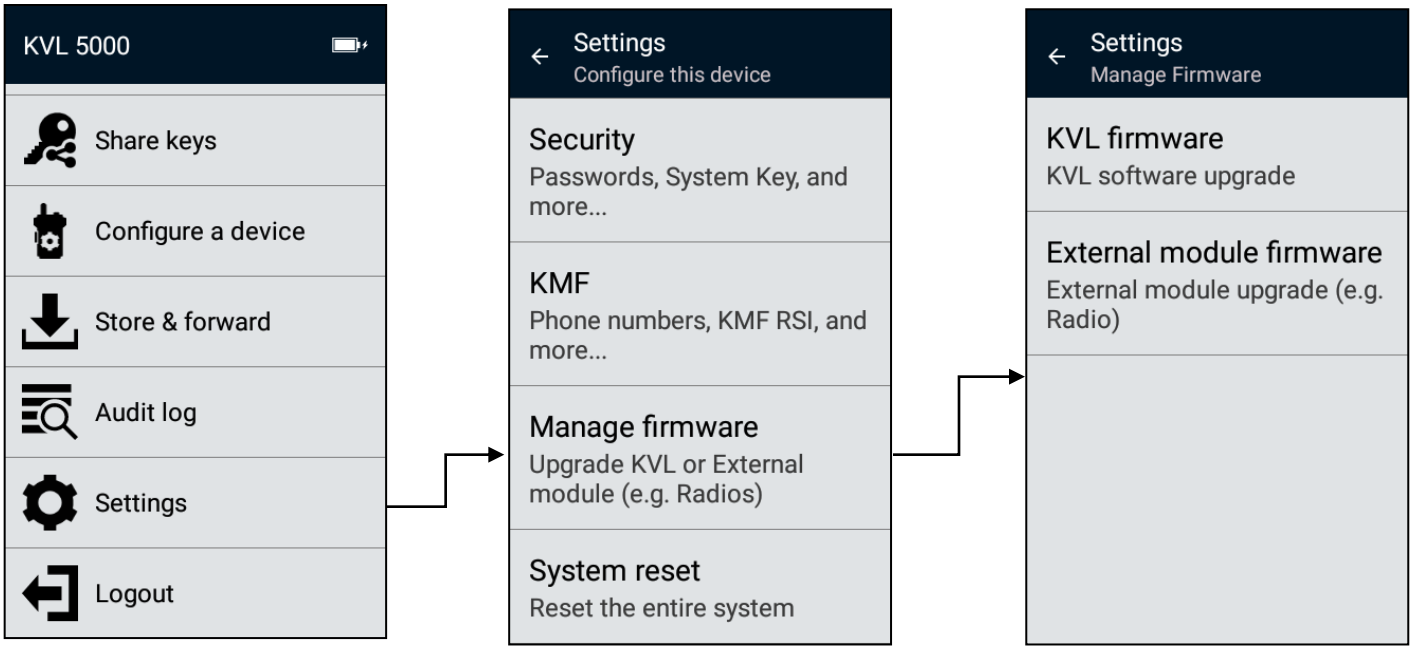
Provision mobile radio (1)

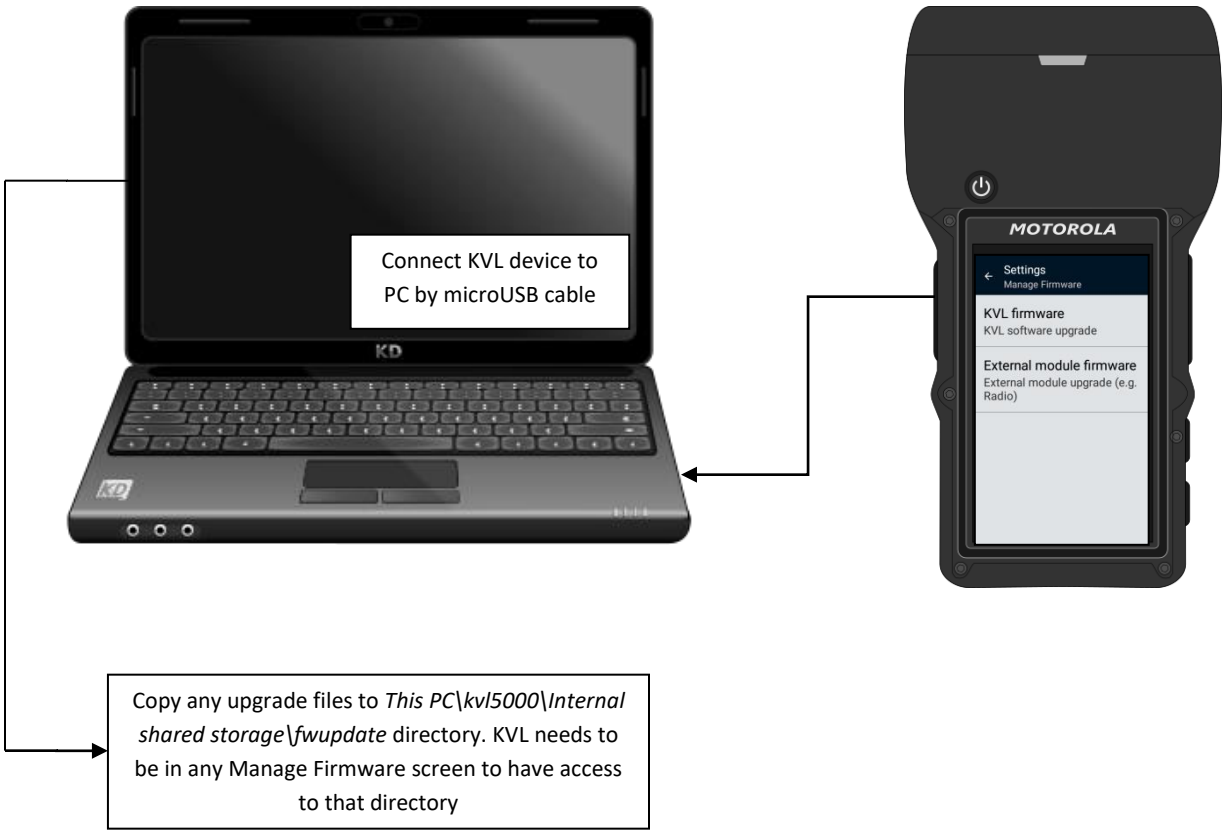


Provision mobile radio (2)



Importing upgrade images





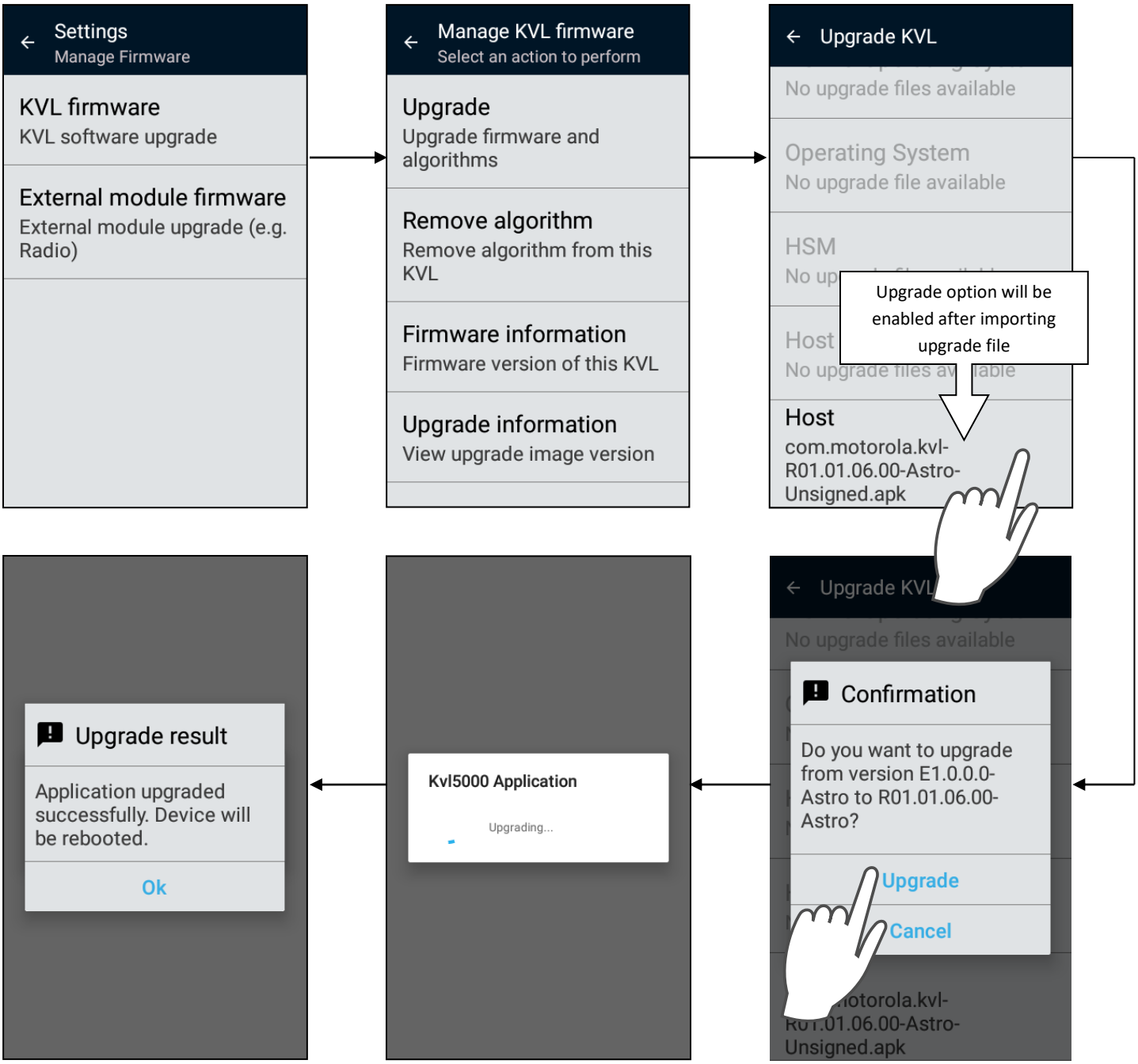
Upgrades

There are four types of upgrade files that can be imported into KVL:

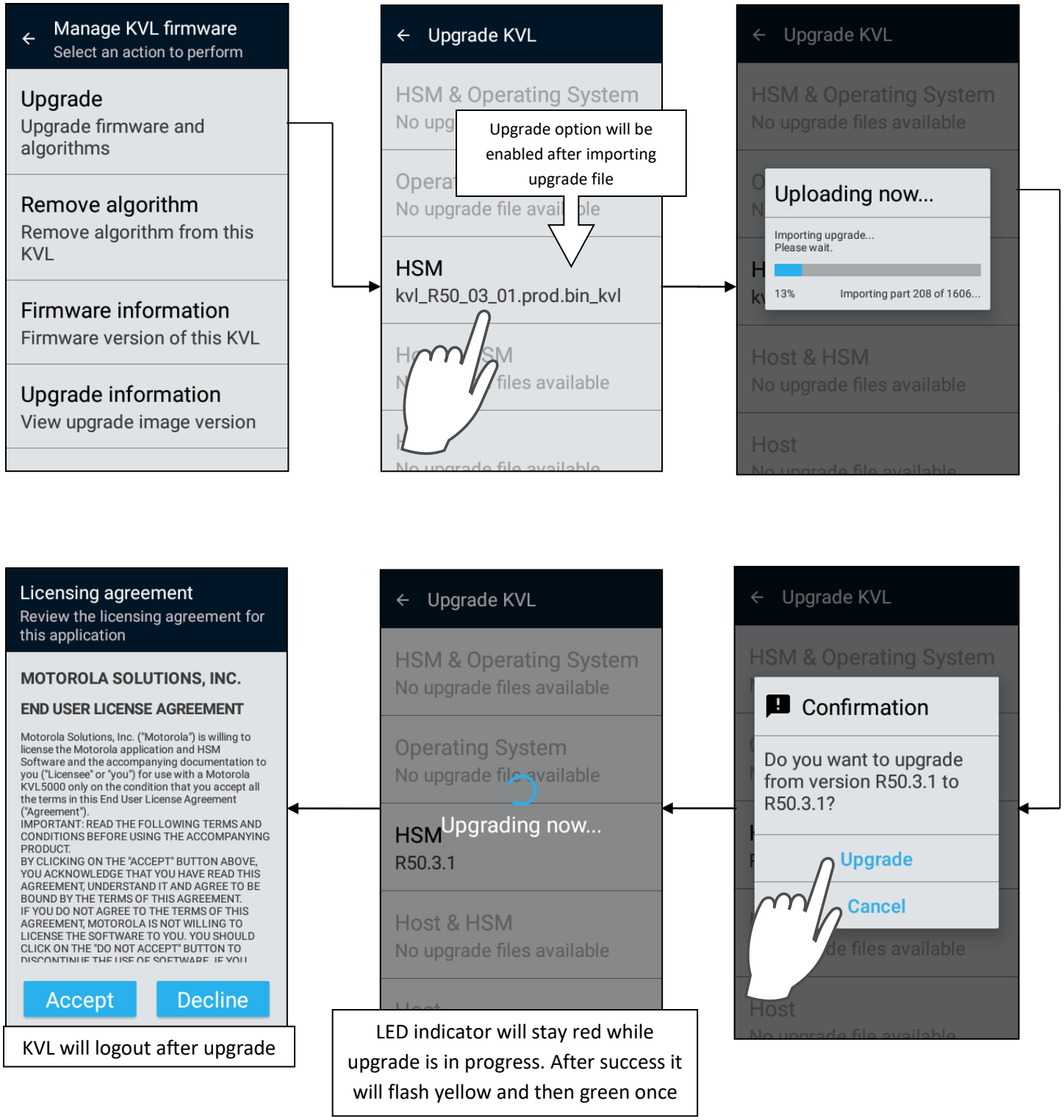
- KVL application (Host) upgrade files with .apk extension
- HSM upgrade files with .bin_kvl extension
- OS upgrade packages with .zip extension
- External device upgrade files with .bin_module extension

KVL will automatically recognize latest upgrade file for each upgrade type. Downgrades are not possible.

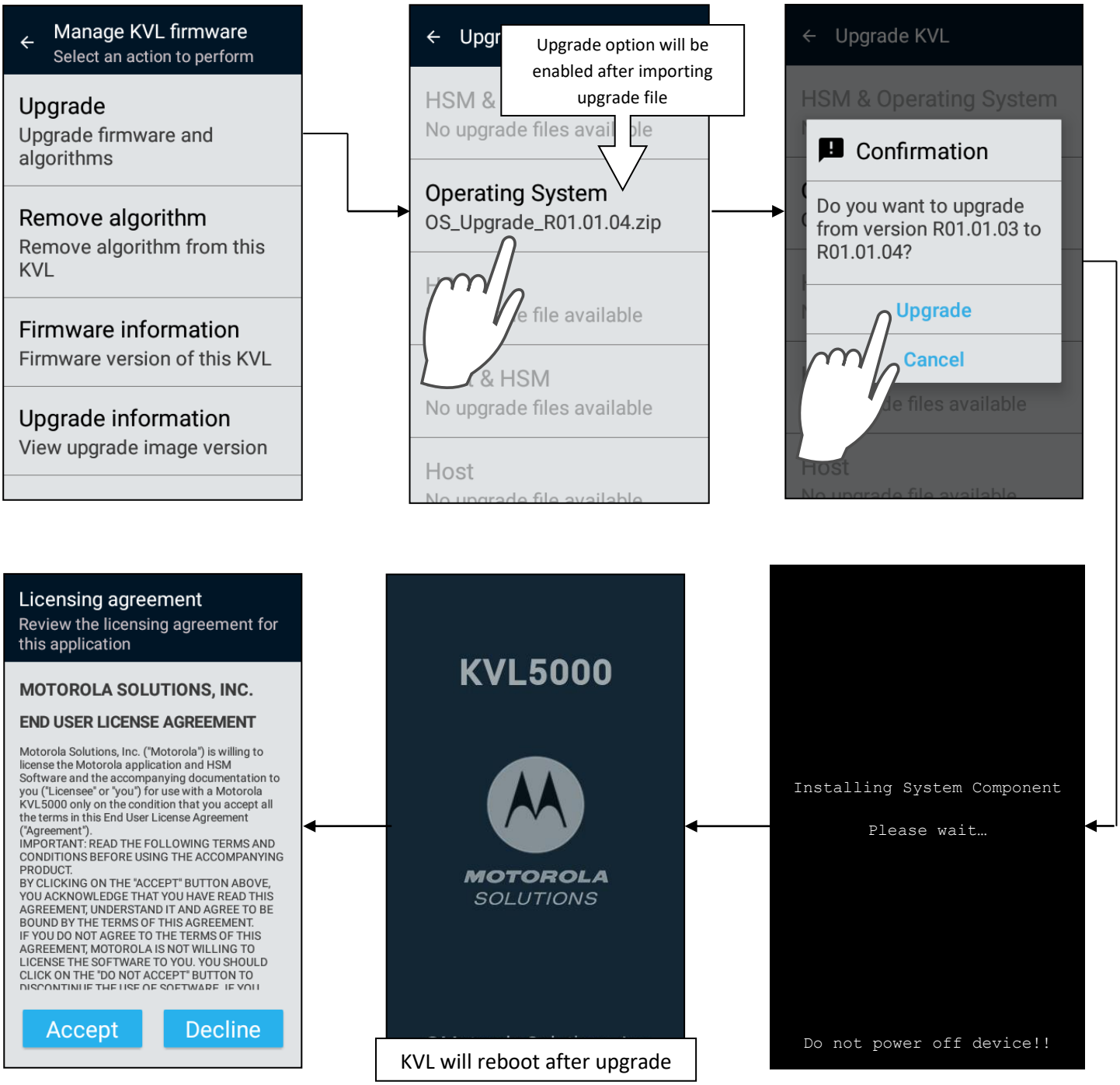
KVL application upgrade



HSM upgrade

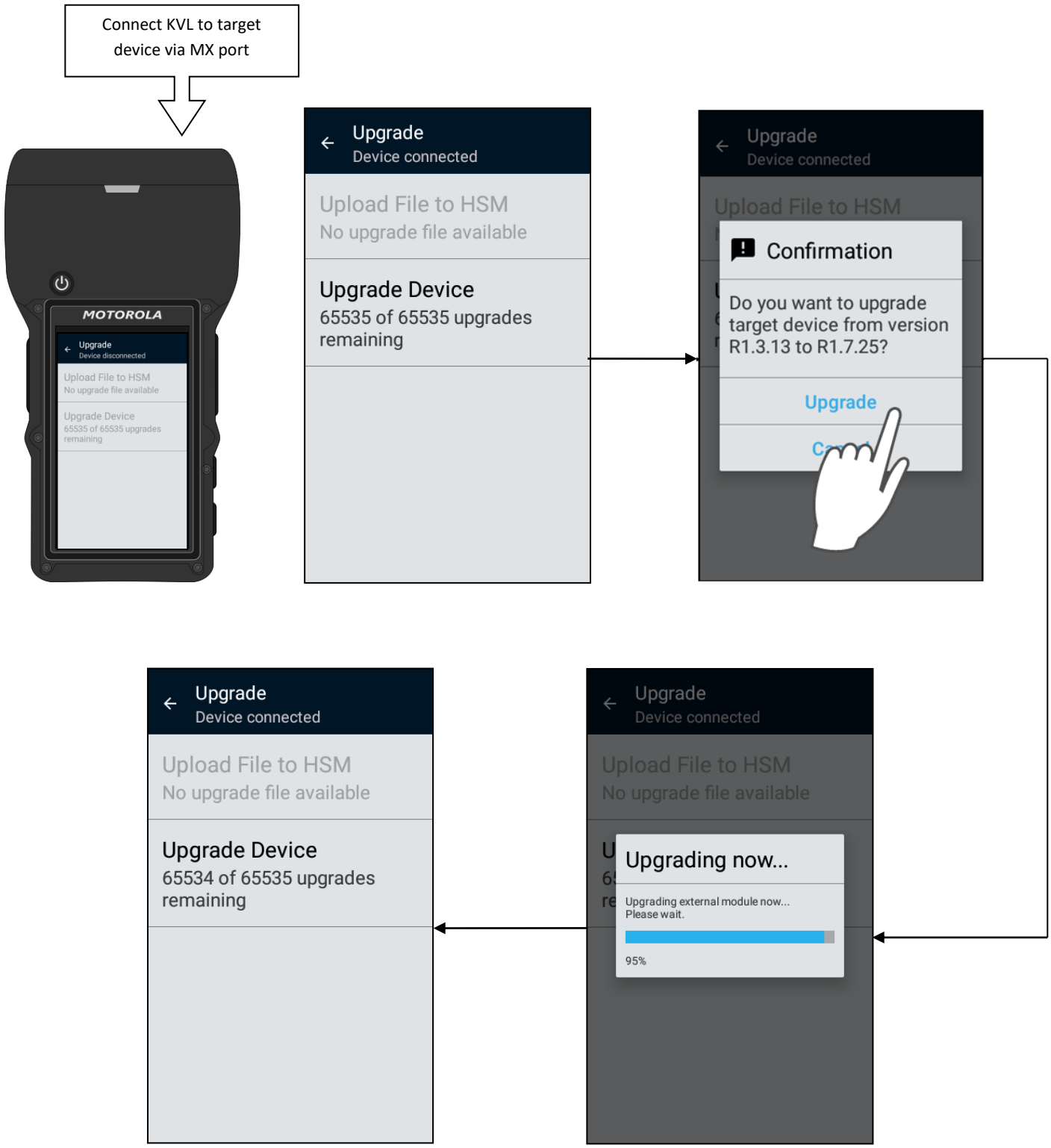

Manage KVL firmware
Select an action to perform
Upgrade
Upgrade firmware and algorithms
Remove algorithm
Remove algorithm from this KVL
Firmware information
Firmware version of this KVL
Upgrade information
View upgrade image version
Upgrade KVL
HSM & Operating System
Upgrade option will be enabled after importing upgrade file
HSM
kvl_R50_03_01.prod.bin_kvl
Upgrade KVL
HSM & Operating System
No upgrade files available
Uploading now...
Importing upgrade...
Please wait.
13%
Importing part 208 of 1606...
Host & HSM
No upgrade files available
Host
Licensing agreement
Review the licensing agreement for this application
MOTOROLA SOLUTIONS, INC.
END USER LICENSE AGREEMENT
Motorola Solutions, Inc. ("Motorola") is willing to license the Motorola application and HSM Software and the accompanying documentation to you ("Licensee" or "you") for use with a Motorola KVL5000 only on the condition that you accept all the terms in this End User License Agreement ("Agreement").
IMPORTANT: READ THE FOLLOWING TERMS AND CONDITIONS BEFORE USING THE ACCOMPANYING PRODUCT.
BY CLICKING ON THE "ACCEPT" BUTTON ABOVE, YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT AND AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT.
IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, MOTOROLA IS NOT WILLING TO LICENSE THE SOFTWARE TO YOU. YOU SHOULD CLICK ON THE "DO NOT ACCEPT" BUTTON TO
Accept
Decline
KVL will logout after upgrade
Upgrade KVL
HSM & Operating System
No upgrade files available
Operating System
HSM
Upgrading now...
R50.3.1
Host & HSM
No upgrade files available
LED indicator will stay red while upgrade is in progress. After success it will flash yellow and then green once
Upgrade KVL
HSM & Operating System
Confirmation
Do you want to upgrade from version R50.3.1 to R50.3.1?
Upgrade
Cancel
Host

Operating system upgrade



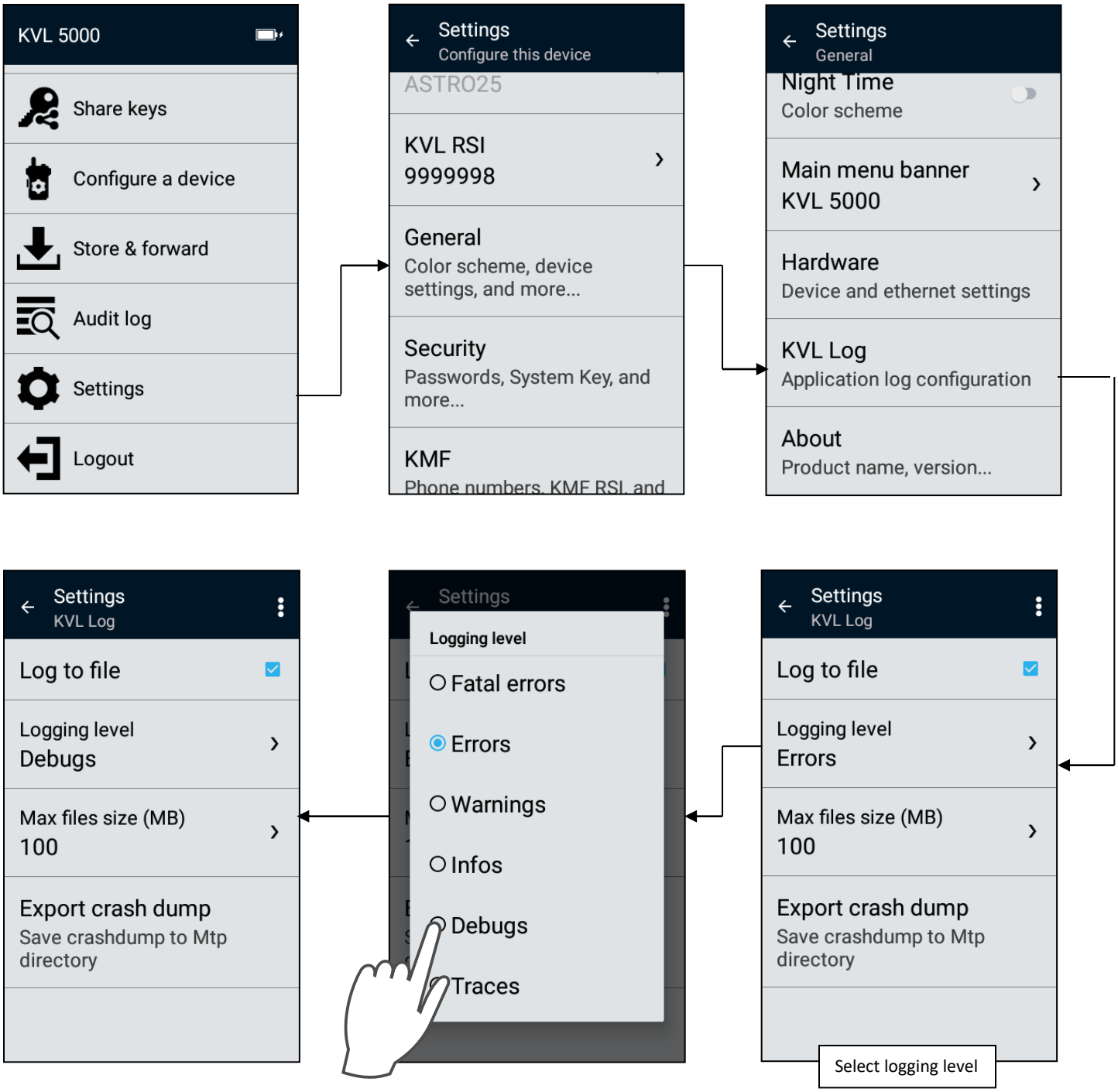
External device upgrade (1)

External device upgrade (2)

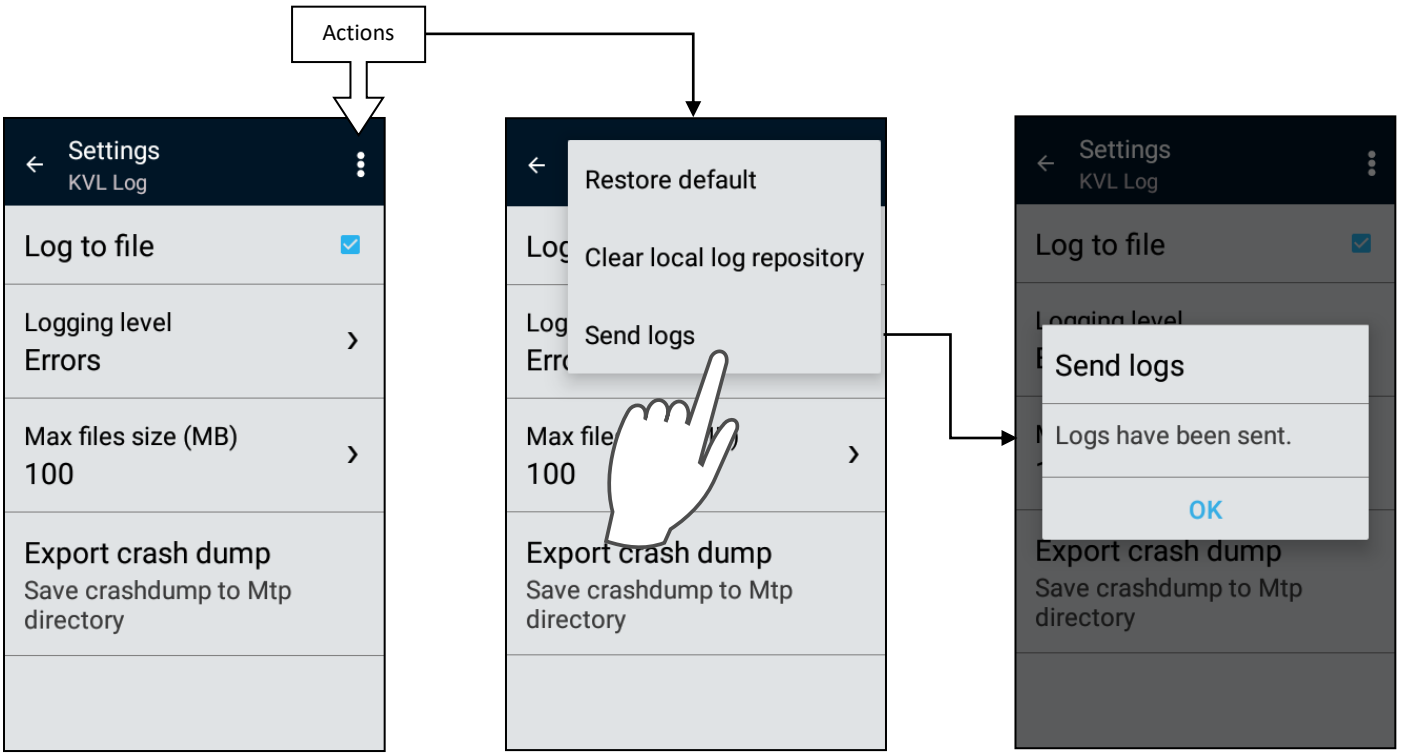


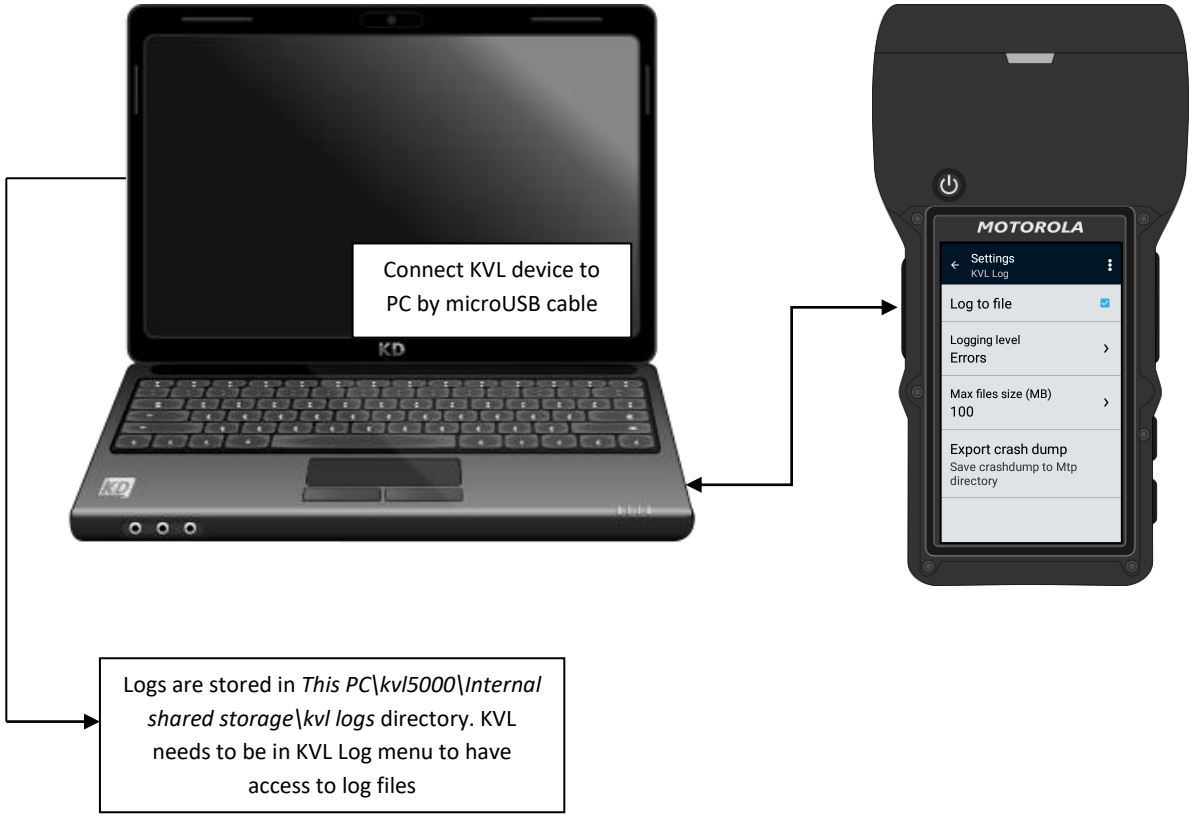
Debug logs

Configuring logging level



Downloading KVL logs to PC





Log event description

The events on the list are sorted from the most severe to the least severe. When you choose a type of event, all more severe events will be logged as well.

For example, if you choose **Warnings**, then **Fatal errors**, **Errors**, and **Warnings** will be logged.

See the following table for more information on the event types:

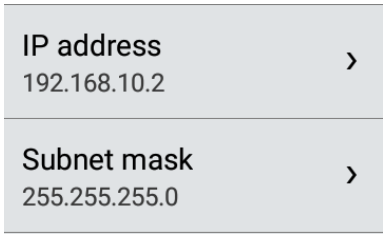
Event Type	Description
Fatal errors	Errors that cause the KVL to stop working correctly
Errors	Errors that do not stop the KVL from running
Warnings	Potentially harmful events
Infos	General informational messages about KVL operation
Debugs	Detailed information about events that are helpful while debugging the KVL
Traces	The lowest severity level of events. All events are logged

Potential IP Connection Issue (1)

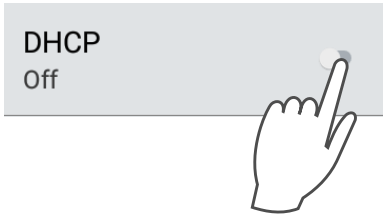
When you connect the KVL to a network and DHCP on KVL is **ON**, in some networks it is possible that the default gateway is not set properly. This may result in connection failure.

IP Connection Troubleshooting Procedure

1. Connect KVL to the network. See S&F with KMF via Ethernet.
2. Go to **Settings →General→Hardware→Ethernet**

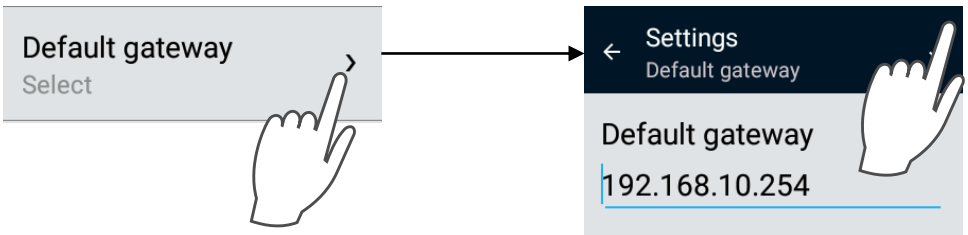


3. Note down values from **IP address** and **Subnet mask** fields.
4. Set **DHCP** to **Off**.

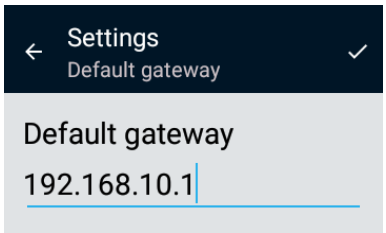


Potential IP Connection Issue (2)

5. In **IP address** and **Subnet mask** fields, manually enter the values that you noted down.
6. Tap **Default gateway**. The maximum value is entered automatically.



7. If the problem is not solved, in the **Default gateway** field enter the minimum allowed value.

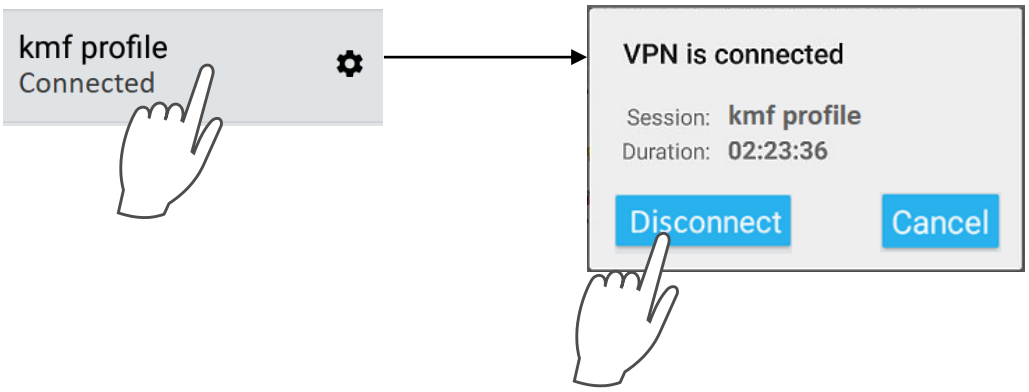


8. If the problem is still not solved, contact your system administrator.

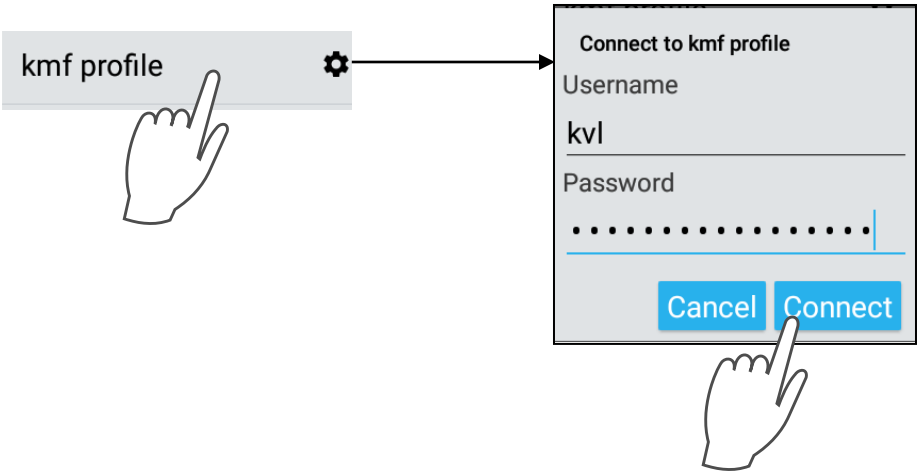
Potential VPN Connection Issue

Most of the VPN connection issues may be resolved in the following way:

- Check the cable connection between KVL and KMF.
- Make sure that the VPN is configured correctly. See Settings VPN section.
- Disconnect and connect to a VPN again by performing the following actions:
  1. From the KVL main menu, go to **Settings → General → Hardware → VPN**.
  2. Tap on a selected VPN to disconnect.



  3. Connect to a VPN by tapping its name on the list. When prompted, enter the credentials for your VPN.



KVL Led Indicators

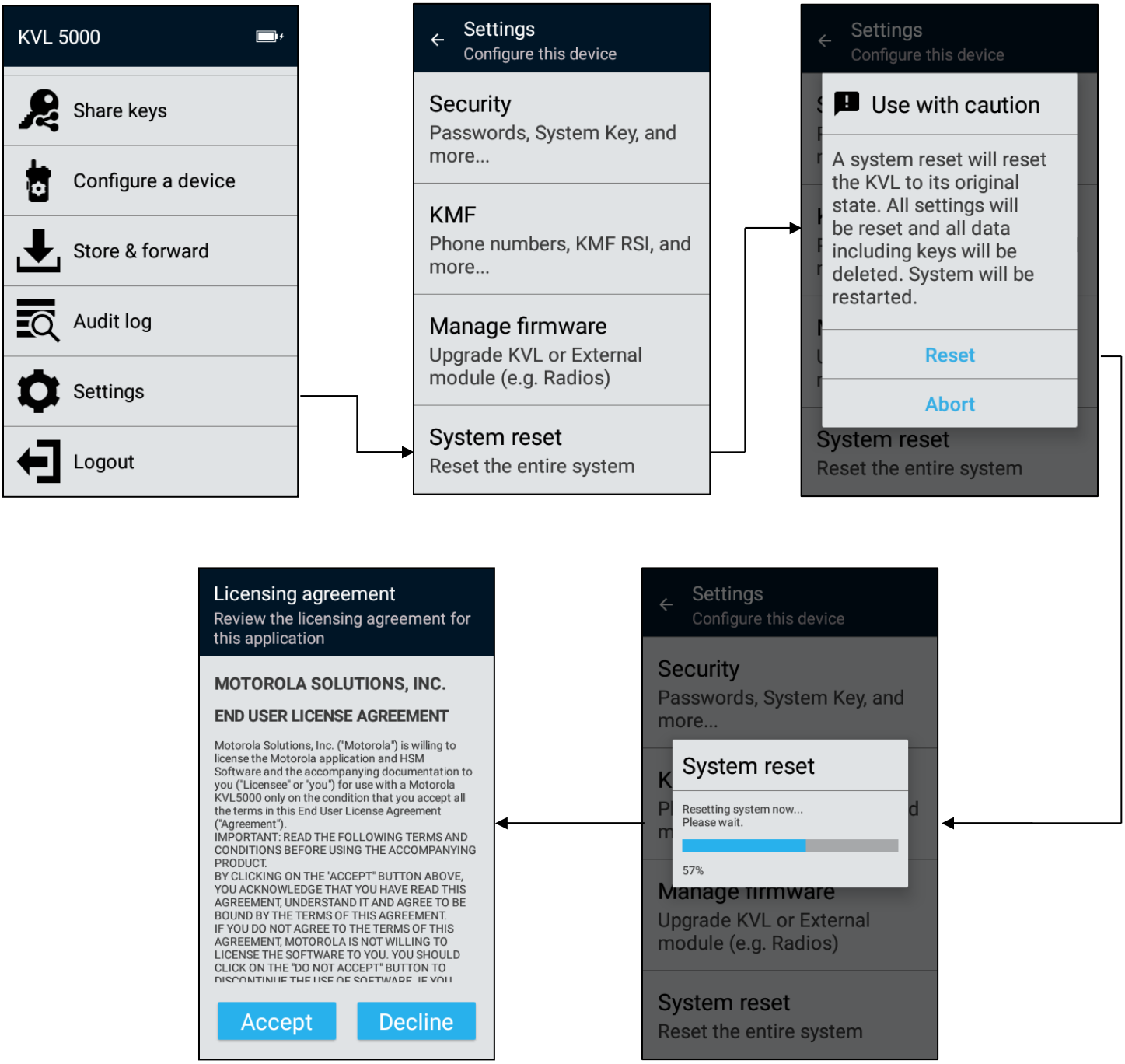
Led color on the KVL provides on current KVL status.

KVL 5000 LED Indicators

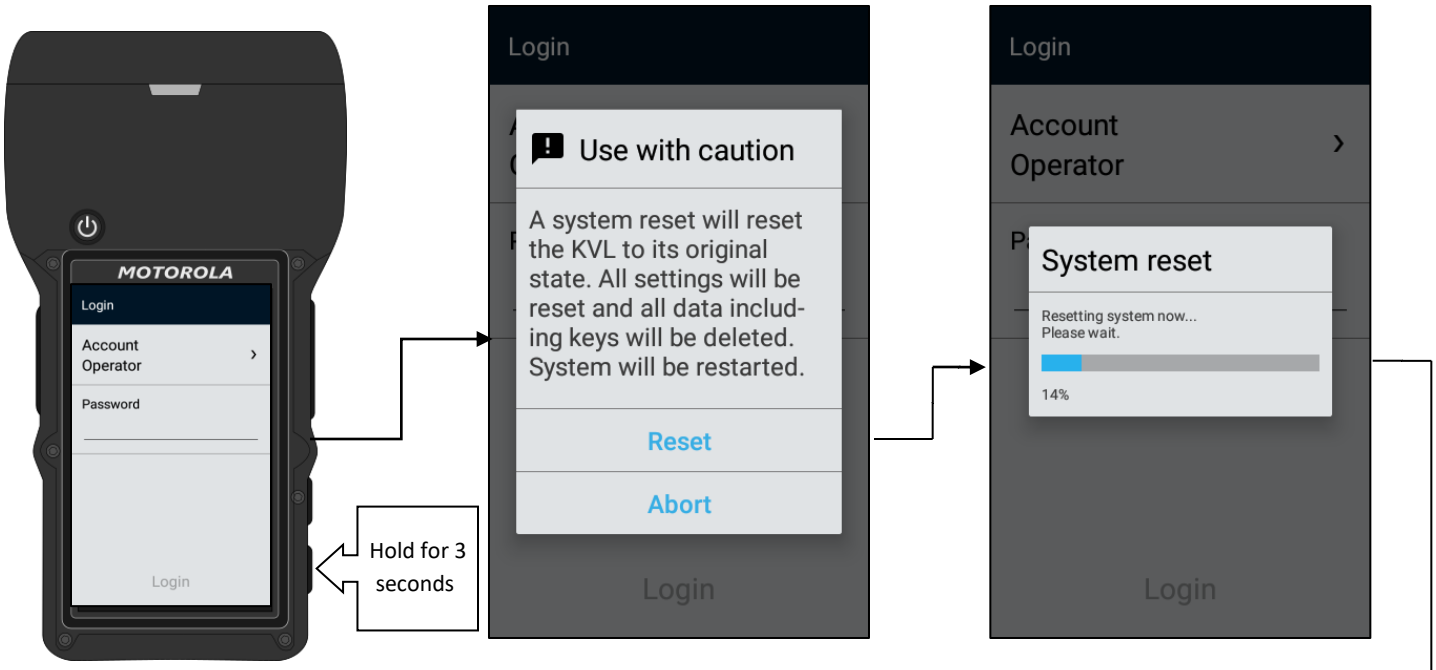
Led color	Meaning
Red	KVL is booting up
Yellow	Checking KVL data integrity
Green	KVL is ready for use
Yellow (flashing)	Formatting KVL memory. May take up to 2 minutes
Red (constant)	KVL may be in one of the states: HSM failure - KVL needs to be restarted HSM permanent failure (restart does not solve issue) – KVL needs to be sent for repair HSM stays in programming mode after upgrading (restart does not solve issue) - KVL needs to be sent for repair

Clearing sensitive data

Perform system reset



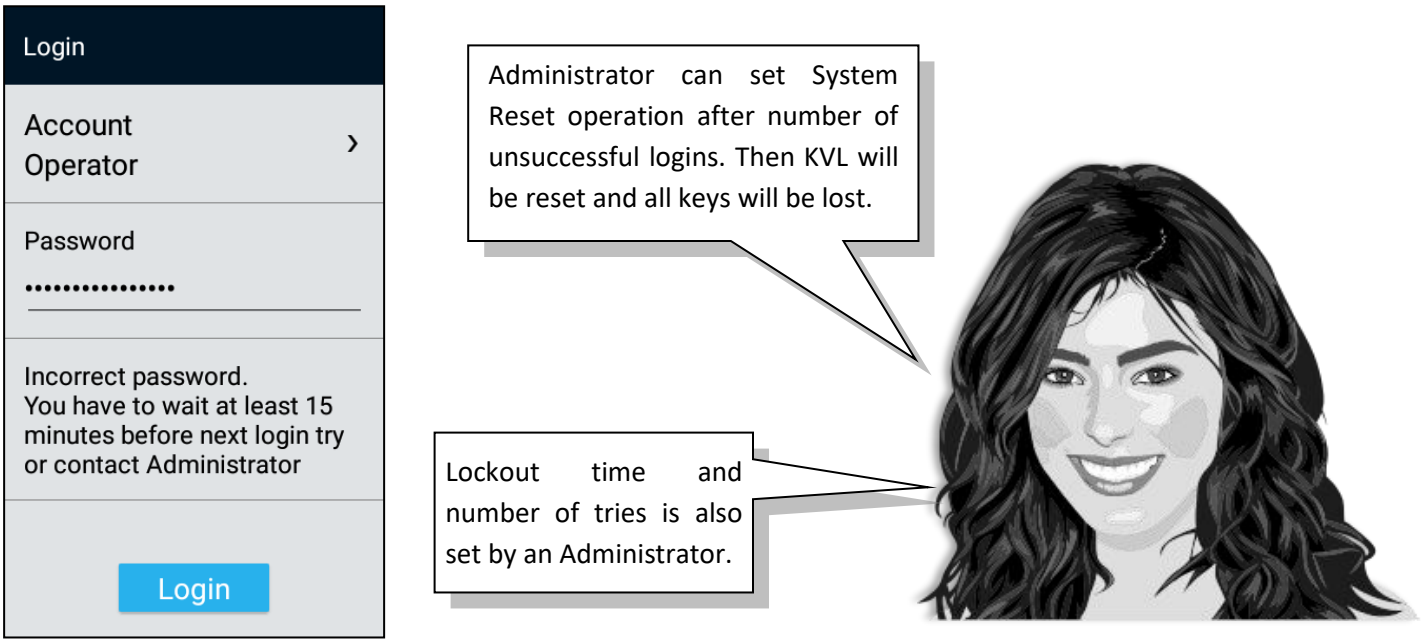
Perform system reset using hardware button



System reset hardware button can be used when not logged in and during most operations

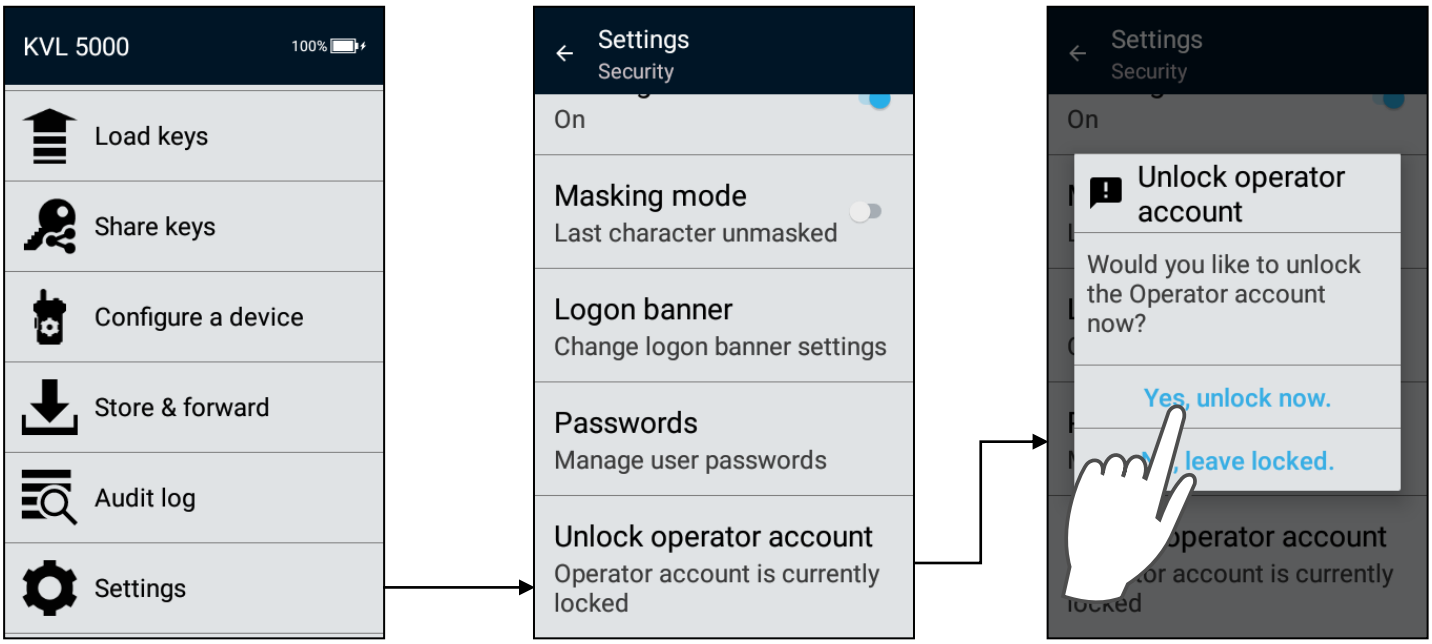
Operator Lockout

When trying to log in with wrong password more than set number of times, lockout is engaged.



Unlocking account

Administrator can unlock Operator's account in Settings.



Potential Radio Authentication issues

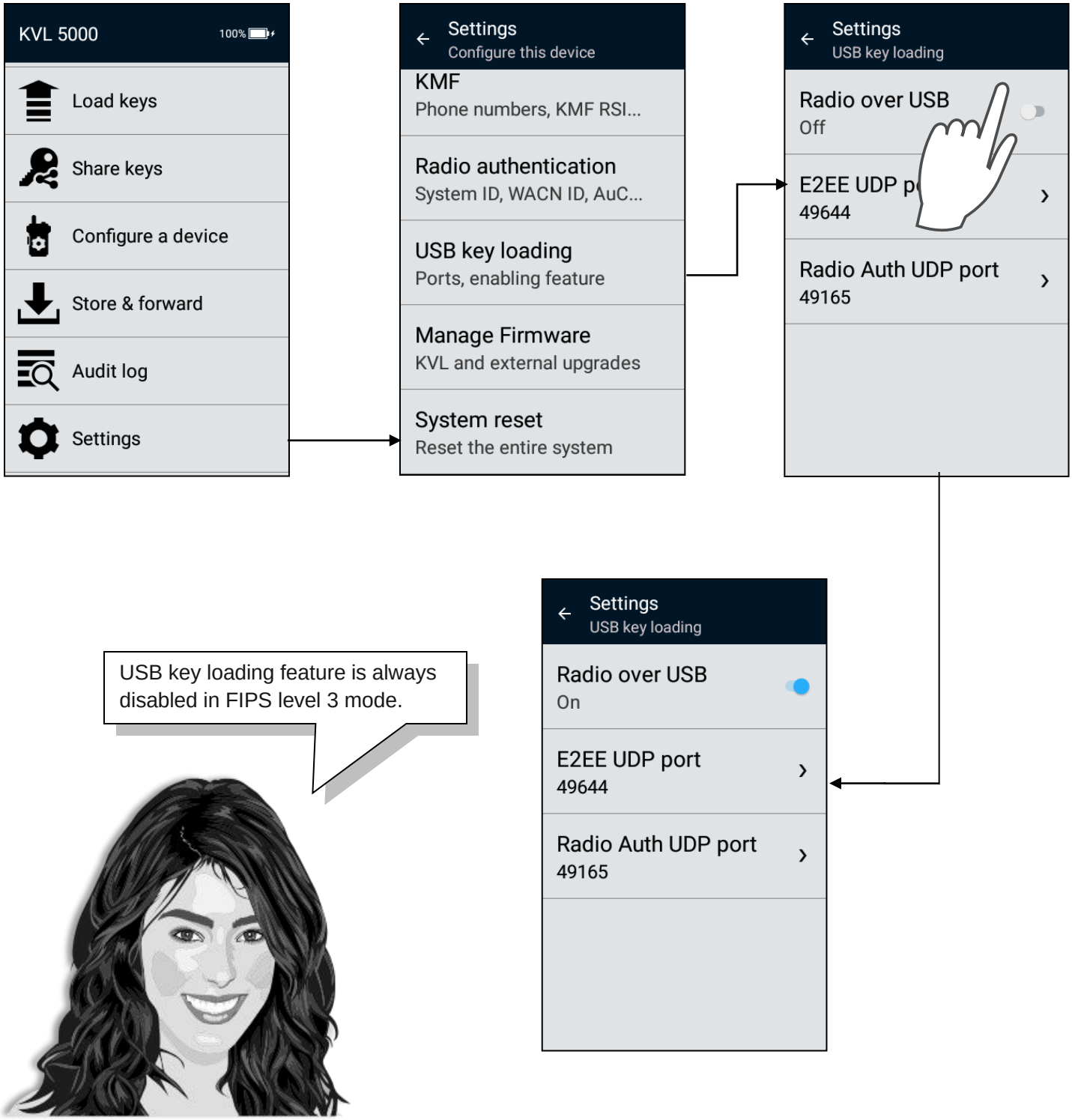
In case there is an issue with connecting KVL to radio for Radio Authentication operations, please make sure that the following conditions are met:

- Serial cable is used for connection between KVL and the radio.
- Radio has been configured for Radio Authentication feature (radio must have Radio Authentication turned on and set correct System ID, WACN ID, Radio Id and Radio port), especially the active profile on the connected radio (each profile can have assigned separate SUID).
- Please note that radio can turn off some of its functions when the battery is low

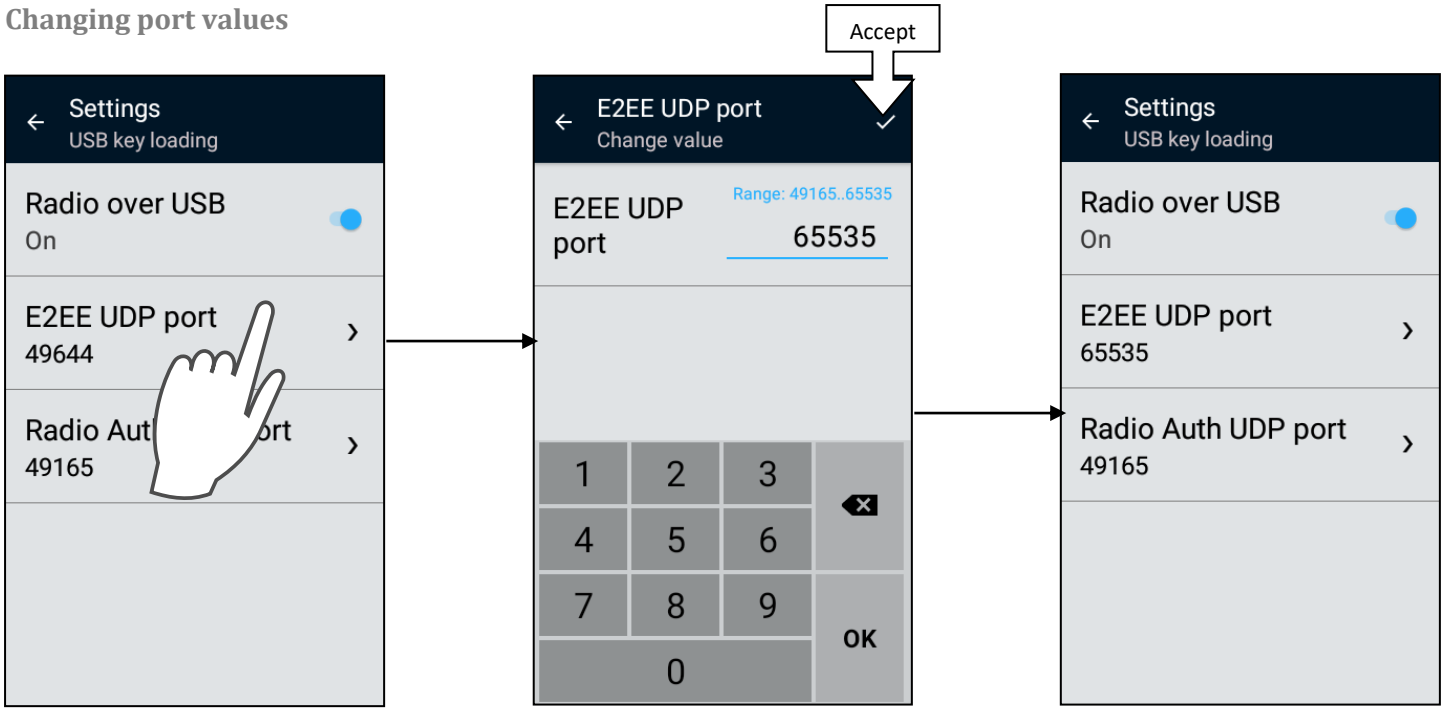
Note: SUID = System ID + WACN ID + Radio ID

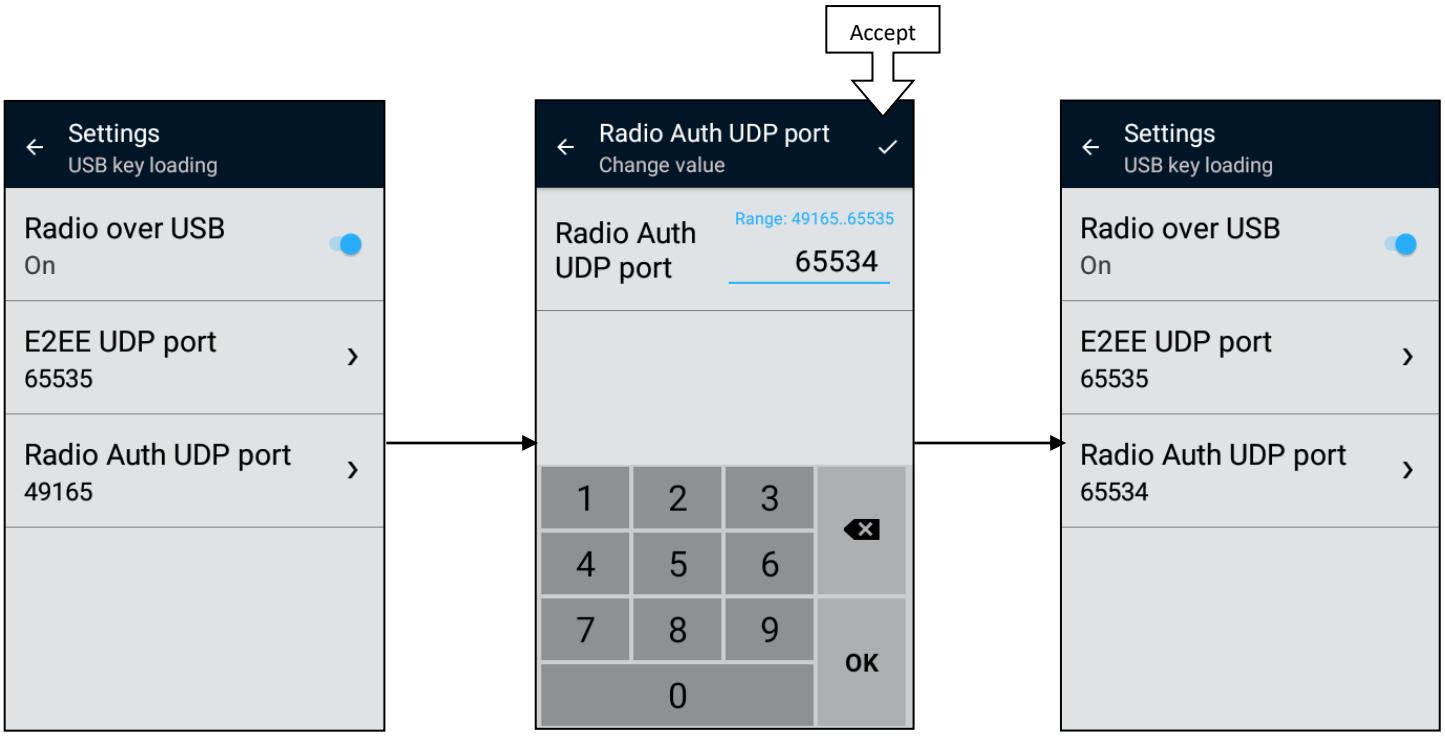
USB key loading

Enabling USB key loading feature



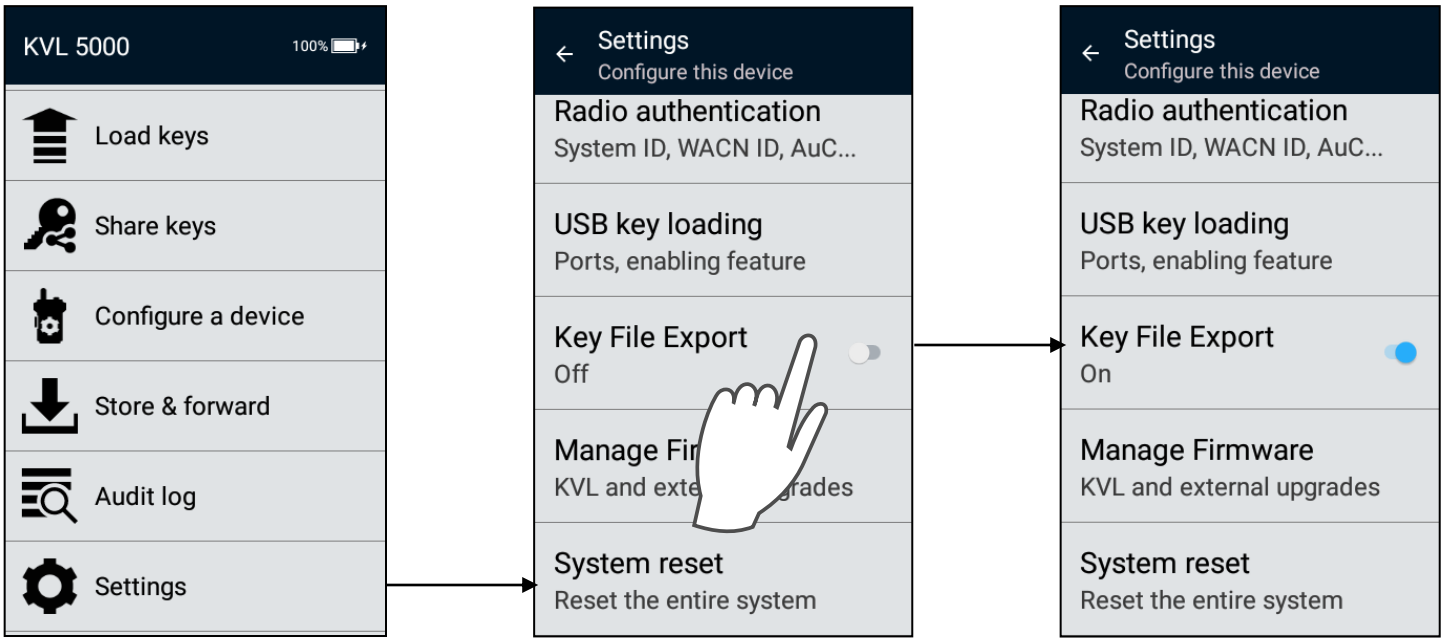
Changing port values



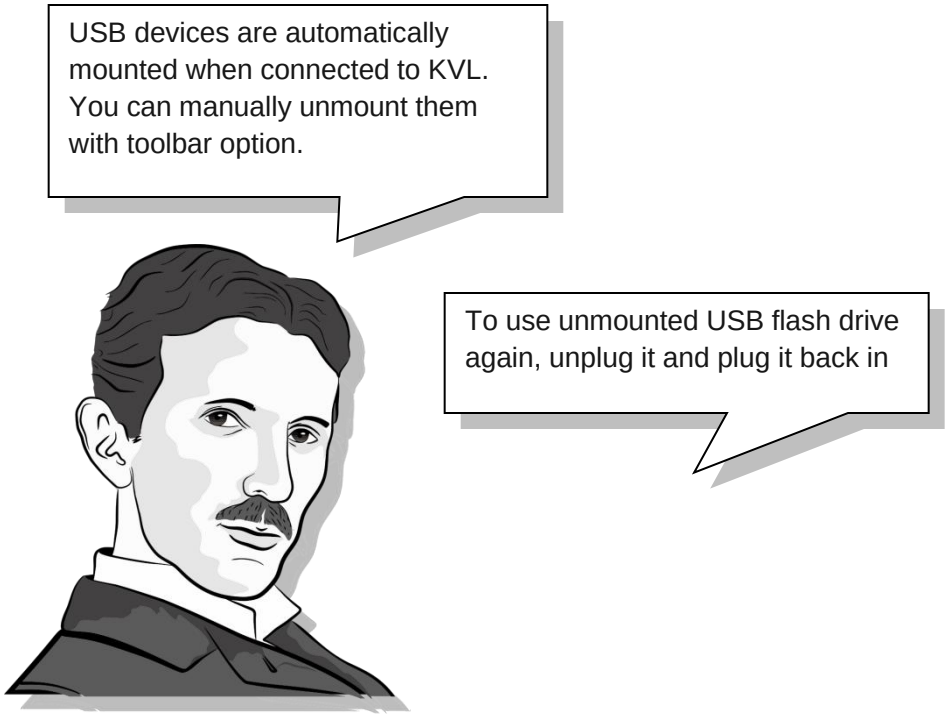


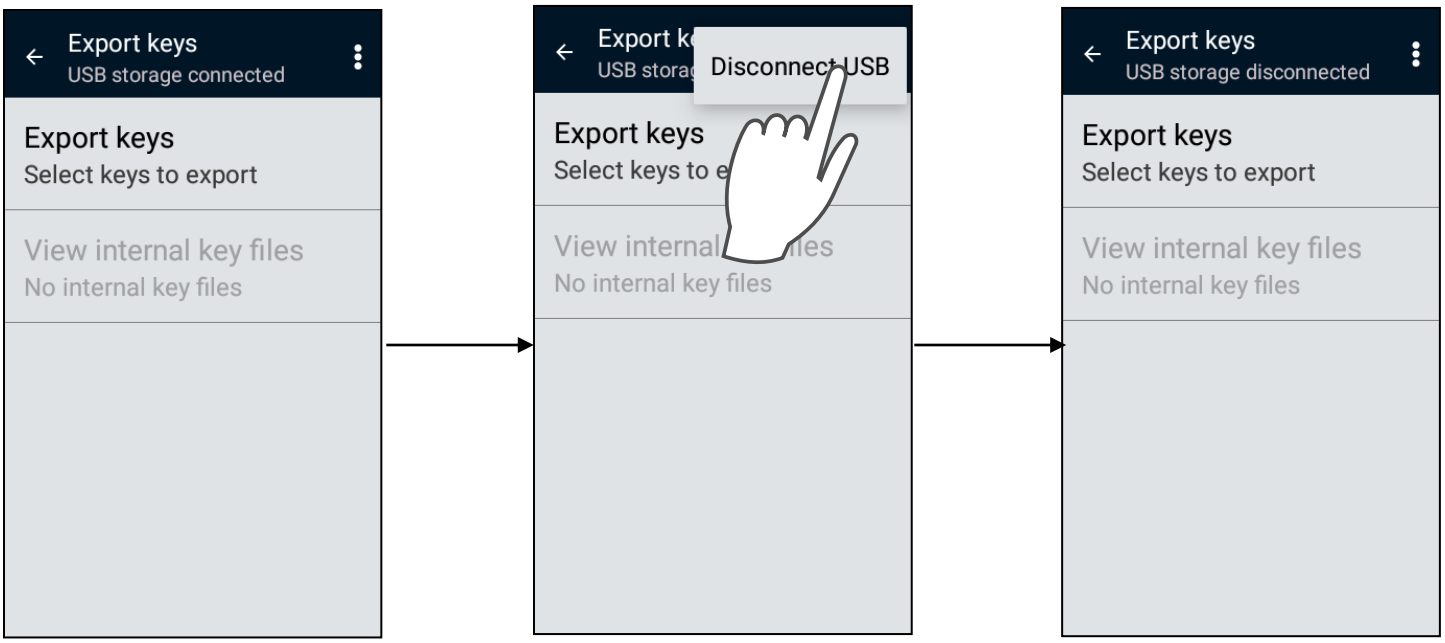
Key File Export

Enabling key file export feature



Unmounting USB flash drive





Key export file missing on USB flash drive

Some USB flash drives will not store exported key if USB flash drive was not unmounted properly. To ensure correct file saving please unmount USB stick after completing file export.

Potential Tactical OTAR issues

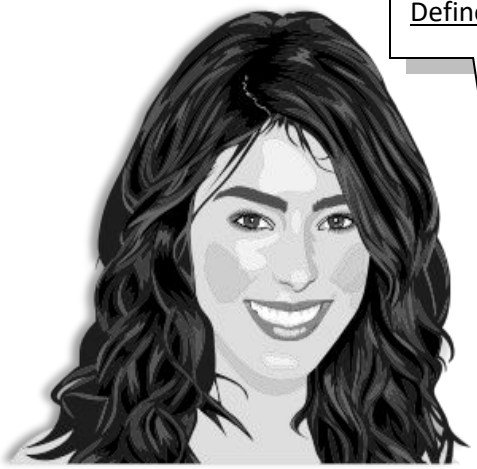
In case there is an issue with connecting KVL to radio for Tactical OTAR update operation, please make sure that the following conditions are met:

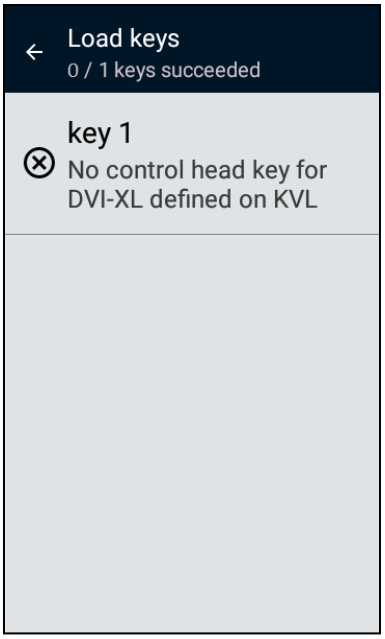
- Serial cable is used for connection between KVL and the radio.
- Radio serving as an RF modem must be equipped with the Tactical Rekey/OTAR feature
- Members to update are within range
- Please note that radio can turn off some of its functions when the battery is low

Potential Control Head issues

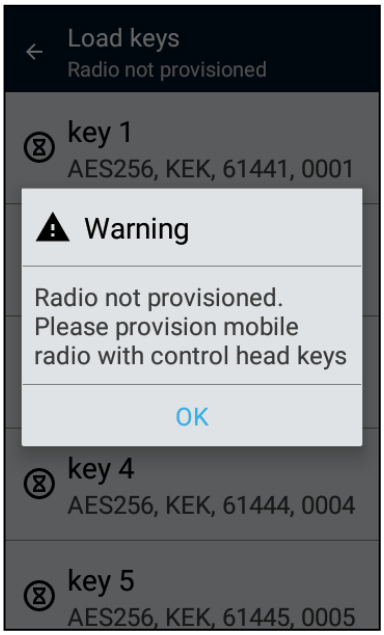
No control head key defined for algorithm

When you see **No control head key defined for an algorithm**, create control head keys for each algorithm. You can check how to do it here Define control head keys





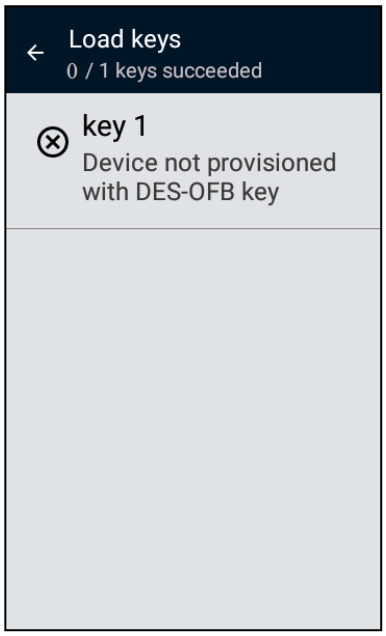
Radio not provisioned



When you see **Radio not provisioned. Please provision mobile radio with control head keys,** create control head keys for each algorithm and provision radio using created keys (see Define control head keys).

Device not provisioned with algorithm key

When you see **Device not provisioned with an algorithm key,** create missing control head keys for the algorithm and provision mobile radio (see Define control head keys).



Appendix: KVL Role based Action List

KVL Action	Admin has Access	Operator has access
Configure Radio		
View Target RSI(s) (Individual, Group)	yes	yes
Change Target Individual RSI	yes	yes
View Target KMF RSI	yes	yes
Change Target KMF RSI	yes	yes
View Target Keys	yes	yes
View Target Keysets	yes	yes
Change Target Active Keyset	yes	yes
View Target MNP	yes	yes
Change Target MNP	yes	yes
Remove Target Key	yes	yes
Remove Target Group	yes	yes
Remove All from Target	yes	yes
Load & Share		
Load Key	yes	yes
Load Key Group	yes	yes
Store and Forward Download	yes	yes
Store and Forward Update	yes	yes
View Targets to Update	yes	yes
Clear Targets to Update	yes	no
Load Automatic SU Auth Key	yes	yes
Load Manual SU Auth Key	yes	yes
Download K-SUID pairs to AuC	yes	yes
View SUID that have been loaded	yes	yes
Clear K-SUID pairs that have been loaded	yes	no

Manage Keys & Groups		
View Key	yes	yes
Add Key	yes	Only with Keys and Groups permission
Delete Key	yes	Only with Keys and Groups permission
Delete KMF / AUC UKEK Keys	yes	Only with Keys and Groups and KMF / AUC permissions
Edit Key	yes	Only with Keys and Groups permission
Add Group	yes	Only with Keys and Groups permission
Delete Group	yes	Only with Keys and Groups permission
Rename Key Profile	yes	no
Clear Key Profile	yes	no
Tactical OTAR		
View Tactical OTAR Groups	yes	yes
Add Tactical OTAR Group	yes	Only with OTAR Groups permission
Delete Tactical OTAR Group	yes	Only with OTAR Groups permission
Edit Tactical OTAR Group	yes	Only with OTAR Groups permission
Add Tactical OTAR Member	yes	Only with OTAR Groups permission
Remove Tactical OTAR Member	yes	Only with OTAR Groups permission
Tactical OTAR Full Update	yes	yes
Tactical OTAR Optimized Update	yes	yes

Settings		
Change KVL RSI	yes	no
Change Theme	yes	yes
Change Inactivity Timeout	yes	no
Change FIPS Mode	yes	no
Change System Key	yes	no
Change Sharing Mode	yes	no
Change Banner Text	yes	no
Change Hardware Settings	yes	yes
Change Application Log Level	yes	yes
Export Application Log	yes	yes
Change Operator Password	yes	yes
Change Admin Password	yes	no
Clear Passwords	yes	no
Change KMF RSI	yes	Only with KMF permission
Change KMF MNP	yes	Only with KMF permission
Change KMF Baud Rate	yes	yes
Change Active KMF	yes	yes
Change KMF Phone #'s	yes	Only with KMF permission
Change KMF UKEK Setup	yes	Only with KMF permission
Enable USB Key Loading	yes	no
Change USB Port Numbers	yes	no
Enable Key File Export	yes	no
View Audit Log	yes	yes
Clear Audit Log	yes	no

Settings		
System Reset	yes	yes
Change KVL Radio Auth ID	yes	Only with AuC permission
Change AuC Destination Port	yes	Only with AuC permission
Change Active AuC	yes	yes
Change SU Destination Port	yes	Only with AuC permission
Change AuC UKEK Setup	yes	Only with AuC permission
Change SU Auth System ID	yes	Only with AuC permission
Change SU Auth WACN ID	yes	Only with AuC permission
Manage Firmware		
Upgrade KVL	yes	no
Remove KVL Algorithms	yes	no
View KVL Firmware Version	yes	yes
Upgrade External Crypto Module	yes	no
Remove Algorithm From External Crypto Module	yes	no
View External Crypto Module Firmware	yes	yes
Control head		
Change MNP	yes	Only with control head permission
Define control head keys	yes	Only with control head permission
Provision mobile radio	yes	yes
Load keys and groups	yes	yes

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 50 - Key Loading Documentation

RFP # 549

December 18, 2025

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Motorola Solutions

Section 1

RFP Section 3.42.4.2 Key Loading Documentation

KVL 5000 Key Variable Loader

The KVL 5000 is Motorola Solutions' encryption Key Variable Loader for secure-enabled Motorola Solutions products. The key loader is outfitted with state-of-the-art features and a user interface for increased efficiency and programming flexibility. A large LCD color display, paired with an easy-to-use alphanumeric keypad, enables simple viewing and data entry.

Figure: KVL 5000 Key Variable Loader Device

Additional programming and key loading documentation has been provided on the following pages.

Use or disclosure of this proposal is subject to the restrictions on the cover page.
Motorola Solutions

P25 KVL 5000

NEXT GENERATION ENCRYPTION KEY LOADER ENSURES SECURE INTEROPERABLE COMMUNICATIONS WITH EASE

The Motorola Solutions Key Variable Loader (KVL) 5000 allows programmers to generate, transport and load encryption keys securely and efficiently into communication products. Packaged in an easy to use one-handed design with an intuitive UI, the KVL 5000 integrates with Key Management Facility (KMF) by provisioning radios to use Over The Air Rekeying (OTAR).

Designed to meet the requirements of two-way radio programmers, the purpose-built KVL 5000 delivers a quick start and snappy response for easy and efficient key loading - without interrupting the rest of their workflow. The only keyloader that can protect keys with a hardware protected keystore, the KVL 5000 provides users with the highest level of secure programming and information protection.

KVL 5000 FEATURES

- FIPS 140-3 Level 2 keyloader
- Hardware Security Module (HSM) to protect keys
- Automatic key load
- Dead battery operation
- AES included
- Hardened out of the box

KVL 5000 ENABLES

- Encrypted communications
- OTAR (KMF Managed)
- Tactical OTAR (KVL Managed)
- Store and forward
- Key creation
- Aftermarket algorithm upgrades
- Radio authentication provisioning
- Control head keyloading

COMPATIBILITY

Compatible with existing KVL 3000/3000+/4000 keyloaders and keyloading cables.

OPTIONAL ACCESSORIES

- USB modem
- USB programming cable

KVL 5000 PORTABLE SPECIFICATIONS

PHYSICAL CHARACTERISTICS	
DIMENSIONS	
Length	145 mm (5.71 in)
Width	76 mm (2.99 in)
Depth	37 mm (1.46 in)
WEIGHT	
KVL with High Capacity (2925 mAh) Battery	300 g (10.6 oz)
BATTERY/CHARGER	
2925 mAH Li-ion USB-Micro Cable	Up to 10 hours of typical keyloading operation
2925 mAH Li-ion Si500 Drop-In Charger	Up to 10 hours of typical keyloading operation

USER INTERFACE	
Display	3.2" Touch Display Transflective, Full Color Portrait/Landscape Display Support Tempered Glass Display
Connectors/Ports	RS232/DB9, USB-micro, MX-style keyload
Remote Connection to KMF/AuC	IP Network: USB-micro to Ethernet Adapter Dial-Up: USB Modem (USB to RJ-11)

ENCRYPTION SPECIFICATIONS	
Supported Systems	ASTRO 25 7.13 or later
Supported Algorithms	AES, DES-OFB, DES-XL, DVI-XL, DVP-XL, ADP
Supported Modes	ASTRO 25 Keyloading, USB Keyloading, Radio Authentication
SUPPORTED PRODUCTS	
APX 900* APX N30* APX 1500* APX 2000 APX 2500 APX 3000 APX 4000 APX N50 APX 4500 APX 5000 APX 5500 APX 6000 APX N70 APX 6500 APX 7000 APX 7500 APX 8000 APX NEXT APX 8500	KMF CDEM WAVE CRYPYR CRYPTR Micro MCC 7500 VPM MCC 7500E CRYPTR PDEG

* SW AES Only

WHAT'S IN THE BOX

- KVL 5000 Unit (P25 software, AES algorithm, hardened by default)
- Battery
- Charging cable (USB-micro)
- Quick Start Guide

WHY KVL 5000?

- Only keyloader with HSM to protect keys
- Purpose built device
- One piece design
- One handed operation
- Rugged (IP54, MIL-STD)
- Multiple keyload
- Ability to create, use, and erase keys
- KMF support
- Key sharing (KVL 4000 to KVL 5000, KVL 3000+ to KVL 5000, KVL 5000 to KVL 5000)
- Quick Startup

UNSUPPORTED PRODUCTS	
ASTRO Saber	XTS 4000 (ARMOR-based)
ASTRO Spectra	XTS 5000
Any ARMOR-based product	DIU
XTL 5000 (ARMOR-based)	MGEG
XTS 3000 (ARMOR-based)	RNC

REGULATORY COMPLIANCE AND APPROVALS	
FIPS 140-3 Level 2	Compliant
Electromagnetic Compatibility	FCC Part 15 Class A Emission, EN55022 Class A Emission, EN50392 RF Exposure
Safety	EN60950, EN62368, UL/cUL, RoHS IP54
MIL-STD	Shock - MIL STD 810G 516.6 I Drop - MIL STD 810G 516.6 IV Vibration - MIL STD 810G 514.6 I/24

ENVIRONMENTAL	
Operating Temperature	-10°C to +50°C
Storage Temperature	-40°C to +70°C
Ingress Protection	IP 54
ESD Protection	EN 55024
Humidity	MIL STD 810G (507.5 II/Agg)

For more information, visit motorolasolutions.com/astro-security.

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Attachment 52 - Portable Radio Accessory Documentation

RFP # 549

December 18, 2025

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Motorola Solutions

Section 1

RFP Section 3.42.5.2A – Portable Radio Accessory Documentation

Portable Radio Accessory information has been provided in the following pages.

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Motorola Solutions

APX radio accessories

Resilience without compromise

MOTOROLA SOLUTIONS

POLIC
SWAT
S. DORE

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Mission critical performance focused on durability and flexibility to keep you safer

Motorola P25 APX radios deliver what first responders need to increase their safety and improve their situational awareness. Get the most out of your APX radio by extending its power and reliability with resilient APX accessories. They are the only accessories tested and certified for use with APX radios. Our accessories endure rigorous testing to last longer and help keep you safer. There's simply no substitute for Motorola APX accessories.

Motorola's exclusive energy and audio features are made for mission critical moments

IMPRES™ 2 Energy: Your radio is your lifeline. If your battery dies, it jeopardizes everything.

That's why we introduced the IMPRES 2 for APX series radios. It's a next-generation energy system that's safer and smarter, while keeping you powered for even longer. With IMPRES 2 chargers, you can charge batteries up to 40% faster. Customize your charging to extend the life of batteries in storage. And manage power more intelligently with enhanced diagnostics, so you get the most from each battery.

IMPRES Audio: I hear you, even when you can't hear yourself.

Motorola's exclusive IMPRES audio accessories help suppress ambient noise, amplify loudness and improve voice intelligibility. IMPRES audio can virtually block out all background noise in any extreme environment with windporting and noise-cancelling technology. Ensure your voice is heard loud and clear no matter what direction you speak with an advanced microphone system. IMPRES audio will make sure you are heard in any demanding environment.

APX NEXT XN

APX NEXT XE

APX NEXT

APX N70 XE

APX N70

APX N50

APX N30

APX N70 XE Featured Accessories

See more compatible accessories throughout the catalog

COMPATIBILITY	ACCESSORY			
APX N70 XE FEATURED ACCESSORIES				
Radio	DESCRIPTION	CATEGORY	PART NUMBER	CARRY ATTACHMENT
APX N70 XE	XVE500m high impact green, channel knob, gcai mini	RSM	PMMN4173	
	XVE500m black channel knob, gcai mini	RSM	PMMN4173_BLK	
	XVE500m high impact green, no channel knob, gcai mini	RSM	PMMN4172	
	XVE500m black no channel knob, gcai mini	RSM	PMMN4172_BLK	
	1-wire Surveillance Kit, Loud, Translucent Tube	Earpiece	PMLN8716	
	2-wire Surveillance Kit, Loud, Translucent Tube	Earpiece	PMLN8717	
	3-wire Surveillance Kit, Loud, Translucent Tube	Earpiece	PMLN8718	
	PTT Nexus Adapter	Adapter	PMLN8297	
	APX N70 XE Classic Holster (Compatible with PMNN4816,PMNN4817,PMNN4818)	Carry	PMLN8689 Carry attachment buy separately	2.5" - PMLN8507 3" - PMLN8508 AY000223A01 AY000229A01 RLN6487 RLN6488 RLN6486
	APX N70 XE Leather Case (use with PMNN4818 only)	Carry	PMLN8690 Carry attachment buy separately	AY000223A01 AY000229A01 RLN6487 RLN6488 RLN6486
	IMPRES 2 Li-Ion 3200 mAh Battery, IP68 Rugged*	Battery	PMNN4816	
	IMPRES 2 Li-Ion 4400 mAh Battery, IP68 Rugged*	Battery	PMNN4817	
	IMPRES 2 Li-Ion 3650 mAh Battery, IP68 Rugged*	Battery	PMNN4818	
	IMPES 2 Single-Unit Fast Charger, US/NA 115V	Charger (SUC)	PMPN4604	
	IMPRES 2 Multi-Unit Fast Charger with 6 Displays and 6 Integrated USB Charging Ports, US/NA, 100-240V	Charger (MUC)	PMPN4591	
	ANTENNA, WHIP, 762-870 MHZ , 15CM,FERRULE	Antenna	AN000411A01	
	ANTENNA, STUBBY, 762-870 MHZ , 10CM, FERRULE	Antenna	AN000418A01	

* APX N70, N70 XE, N50, N30 & APX NEXT XN batteries come with self-calibration feature when used with IMPRES 2 Single-Unit Fast Charger (SW ver V2.05 and above) and IMPRES 2 Multi-Unit Fast Charger (SW ver V2.05 and above).

XVN500 Remote speaker microphone

Audio for extreme environments

The XVN500 features four high dynamic range (HDR) microphones, which are arranged for all-round coverage. This guarantees that communications are clear from every direction. The designated HDR mic arrangement also provides significant muffled audio reductions from any positions that the RSM may be held or worn.

To further enhance noise suppression, all HDR microphones are not only windported but are also placed behind our exclusively engineered housing. This further redirects airflow and facilitates water draining, effectively mitigating any leftover wind noise. The adaptive noise suppression also allows for voice tracking while filtering out surrounding background noise, giving you the best clarity in your communications.

The XVN500's HDR microphone technology prevents speech distortion, even when shouting in extreme noise environments. And as the noise environment changes, so will the XVN500 to adjust for maximum noise cancellation. When combined with the APX NEXT XN, this technology will give firefighters high quality audio features for any intense situation.

Loud and intelligible

The XVN500 RSM speaker improves speaker clarity while the maintaining best in class volumes. Even at the highest volume, the RSM will maintain understandable and intelligible audio output. This audio cuts through the noisiest environments while simultaneously preserving audio richness at mid to low volumes.

The XVN500 audio experience is enhanced by using the full features of the adaptive audio engine on the APX NEXT XN. This dynamically optimizes the radio's performance in the presence of background noise. Adaptive microphones gain control while adaptive speaker equalization provides the loudest, most intelligible audio in any environment, even at maximum volume.

The algorithm in the XVN500 RSM allows additional audio features like Receive Volume Leveling to be maximized through the RSM. With receive volume leveling, a firefighter can set the volume once, and the radio will adjust based on the power of the received audio of loud or soft voices.

XVN500 RSM button configuration

APX N portable radio accessories

COMPATIBILITY	ACCESSORY		FEATURES										
REMOTE SPEAKER MICROPHONES (RSM)													
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	IMPRES AUDIO	MICROPHONE NOISE SUPPRESSION	ViQi SUPPORT	VOLUME CONTROL	ORANGE PROGRAMMABLE BUTTON	CHANNEL CONTROL	AUDIO JACK	PROGRAM-MABLE BUTTON	IP RATING	HAZLOC-CAPABLE†	SIZE (WITHOUT CLIP) (MM)
APX NEXT XN	XVN500 high impact green, no channel knob, Xtreme temperature cable (meets latest fire standard)	PMMN4138	•	•	•	•	•			2	IP68	UL	75 x 98 x 34
	XVN500 high impact green, with channel knob, Xtreme temperature cable (meets latest fire standard)	PMMN4162	•	•	•	•	•	•		2	IP68	UL	75 x 98 x 34
APX NEXT XE APX NEXT	XVE500 high impact green, channel knob, Xtreme Temperature Cable	PMMN4154	•	•	•	•	•	•		2	IP68	UL	75 x 98 x 34
	XVE500 black housing, channel knob, Xtreme temperature cable	PMMN4154 _BLK	•	•	•	•	•	•		2	IP68	UL	75 x 98 x 34
	XVE500 High impact green, no channel knob, Xtreme temperature cable	PMMN4152	•	•	•	•	•			2	IP68	UL	75 x 98 x 34
	XVE500 black housing, no channel knob, Xtreme temperature cable	PMMN4152 _BLK	•	•	•	•	•			2	IP68	UL	75 x 98 x 34
	XVP850 RSM with channel knob TAA compliant	PMMN4135_ TAA	•	•	•	•	•	•	•	3	IP68	UL	58 x 93 x 31
	XVP830 RSM without channel knob TAA compliant	PMMN4136_ TAA	•	•	•	•	•		•	3	IP68	UL	58 x 93 x 31
	XVP850 RSM with channel knob	PMMN4135	•	•	•	•	•	•	•	3	IP68	UL	58 x 93 x 31
	XVP850 RSM without channel knob	PMMN4136	•	•	•	•	•		•	3	IP68	UL	58 x 93 x 31
APX N70 XE	XVE500m high impact green, channel knob, Xtreme Temperature Cable	PMMN4173	•	•	•	•	•	•		2	IP68	UL	75 x 98 x 34
	XVE500m black housing, channel knob, Xtreme temperature cable	PMMN4173 _BLK	•	•	•	•	•	•		2	IP68	UL	75 x 98 x 34
	XVE500 High impact green, no channel knob, Xtreme temperature cable	PMMN4172	•	•	•	•	•			2	IP68	UL	75 x 98 x 34
	XVE500 black housing, no channel knob, Xtreme temperature cable	PMMN4172 _BLK	•	•	•	•	•			2	IP68	UL	75 x 98 x 34

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual [illegible] UL-approved APX portable.
* Compatible with APX N50 when the "Audio Bundle" is selected

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APX N portable radio accessories

COMPATIBILITY	ACCESSORY		FEATURES										
REMOTE SPEAKER MICROPHONES (RSM)													
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	IMPRES AUDIO	MICROPHONE NOISE SUPPRESSION	ViQi SUPPORT	VOLUME CONTROL	ORANGE PROGRAMMABLE BUTTON	CHANNEL CONTROL	AUDIO JACK	PROGRAM-MABLE BUTTON	IP RATING	HAZLOC-CAPABLE†	SIZE (WITHOUT CLIP) (MM)
Portable Radios: **APX NEXT** **APX NEXTi** **APX N70** **APX N70 XE** **APX N50** **APX N30** **APX8000** **APX6000 BN** **APX900** **APX6000XE** **APX8000XE** **APX8000H** **APX8000HXE** **SRX 2200** **Mobile Radios:** **APX8500** **APX6500 BN** **APX5500 BN** **APX4500 BN** **APX2500 BN** **APX1500 BN** **Not Supported with Standard APX radios in analog channel**	WM800 wireless RSM	**PMMN4156**	•	•	•	•	2		•	•	IP68	UL	67.5 x 98 x 32
APX NEXT APX N70	SVX VRSM	**PMMN8200**		•	•	•	•		•	3	IP68	UL	61.1 x 109.3 36.4
APX N70 XE APX N70 APX N50*	XVP750 RSM with channel knob	**PMMN4141_TAA**	•	•	•	•	•	•	•	3	IP68	UL	58 x 93 x 31
	XVP730 RSM without channel knob	**PMMN4142_TAA**	•	•	•	•	•		•	3	IP68	UL	58 x 93 x 31
APX N70 XE APX N70 APX N50 APX N30	RM780 RSM	**PMMN4177**	•	Windporting mic		•	•		•	2	IP68	UL	77 x 58 x 25

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual provided with each UL-approved APX portable.
* Compatible with APX N50 when the "Audio Bundle" is selected

APX N portable radio accessories

COMPATIBILITY	ACCESSORY	
Remote speaker microphone accessories and replacement parts		
RSM's	DESCRIPTION	PART NUMBER
RSM REPLACEMENT PARTS		
XVN500	Xtreme temperature replacement cable for XVN500 RSM	CB001073A01
	XVN500 RSM clip assembly with brass insert designed to work with the boston leather straps (AY000223A01, AY000229A01) requires clip button NNTN8749	PMLN9005
	Replacement channel knob (20pcs per pack)	PMLN7653
XVE500 XVE500m	Xtreme temperature replacement cable for XVE500 RSM	CB001138A01
	Xtreme temperature replacement cable for XVE500m RSM (GCAI mini)	CB001289A01
	XVE500 RSM clip assembly with brass insert designed to work with the boston leather straps (AY000223A01, AY000229A01) requires clip button NNTN8749	PMLN7633
XVN500 XVE500	Replacement channel knob (20pcs per pack)	PMLN7653
	Clip button	NNTN8749
XVP850 XVP830	Replacement coil cord	PMKN4260
WM800 XVP850 XVP830 XVP750 XVP730	Low profile swivel clip with D-ring (10pcs per pack)	PMLN8312
	Swivel molle clip	PMLN8675
XVP850 XVP750	Replacement channel knob (20pcs per pack)	PMLN8313
XVP750 XVP730	Replacement coil cord	PMKN4461
RM780	Replacement cable for RM780	PMKN4462
	Replacement dust cover for RM780 (10pcs per pack)	PMLN8122
	Replacement low profile swivel clip	PMLN8121

SVX Video remote speaker microphone

Voice and video, combined without compromise

By converging our industry-leading APX NEXT and N70 radio line and our trusted body camera technology, we've transformed what it means to be on the front line. Now, your team can get the best of both worlds, by accessing mission-critical communications, evidential video capture and public safety-grade AI from one device, without sacrificing ergonomics or usability.

But we didn't stop there. We know that, even though technology should be a force multiplier for modern law enforcement agencies, it often just serves to create more stress - whether it's an issue of equipment management, training or budget. The SVX solution goes beyond just converging hardware: it also revolutionizes the workflows around device deployment, usage and even evidence handling: so now, your team can get twice the results from half the resources.

APX, amplified and more intelligent

Clear audio is a crucial element of effective law enforcement, from talking to your team throughout a high-stakes situation, to capturing confessions and witness statements on the go. Like the rest of our RSM portfolio, the SVX is designed with audio quality top of mind: two high dynamic range (HDR) microphones, sophisticated windporting and intelligent noise reduction technology ensure that officers will be heard, even in the most demanding conditions.

This clear audio means that ViQi will hear you better than ever before, and it's also the gateway to a better response downstream: leveraging the SVX's voice technology, our Assist AI can generate more reliable incident creation prompts for dispatchers, and provide more accurate license plate searches for intelligence analysts.

SVX VRSM overview

APX N portable radio accessories

COMPATIBILITY	ACCESSORY		
SVX Video Remote Speaker Microphone Accessories			
RSM	DESCRIPTION	CATEGORIES	PART NUMBER
SVX	Receive-Only Earpiece w/Translucent Tube, Extra Loud, 3.5mm Audio Jack	Earpiece	PMLN8708
	2-Wire Surveillance Earpiece w/Translucent Tube, Extra Loud, 3.5mm Audio Jack	Earpiece	PMLN8709
	Quick Disconnect Long Translucent Tube with Clear Rubber Eartip (compatible with PMLN8708 and PMLN8709 only)	Earpiece	RLN6569
	SVX Li-Ion 4300T Battery, IP68 Rated	Battery	PMNN4893
	12 Slot Charging Dock US/NA	Charger	PMPN5026
	10 Slot Smart Charging/Upload Dock	Charger	PMPN5022
	Magnetic Shirt Mount, V300/V700 BWC	Mount	WGP02798
	Shirt Clip, V300/V700 BWC	Mount	WGP02697
	Heavy Jacket Magnetic Mount, V300/V700 BWC	Mount	WGP03085
	Heavy Jacket Clip, V300/V700 BWC	Mount	WGP03088
	Molle Locking Mount V300/V700 BWC	Mount	WGA00668

APX portable radio accessories

COMPATIBILITY	ACCESSORY		FEATURES									
WM800 WIRELESS REMOTE SPEAKER MICROPHONE												
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	IMPRES AUDIO	MICROPHONE NOISE SUPPRESSION	ViQi SUPPORT	VOLUME CONTROL	PROGRAM-MABLE BUTTON	ORANGE PROGRAMMABLE BUTTON	AUDIO JACK	IP RATING	HAZLOC-CAPABLE†	SIZE (WITHOUT CLIP) (MM)
Portable Radios: APX NEXT APX NEXTi APX N70 APX N50 APX N30 APX8000 APX6000 BN APX900 APX6000XE APX8000XE APX8000H APX8000HXE SRX 2200 Mobile Radios: APX8500 APX6500 BN APX5500 BN APX4500 BN APX2500 BN APX1500 BN Not Supported with Standard APX radios in analog channel	WM800 wireless RSM (with battery and USB charging cable)	PMMN4158	•	•	•	•	2	•	•	IP68	UL	67.5 x 98 x 32

COMPATIBILITY	ACCESSORY		
WM800 ACCESSORIES AND REPLACEMENT PARTS			
ACCESSORY	DESCRIPTION	CATEGORIES	PART NUMBER
WM800	WM800 wireless RSM only (without battery, swivel molle clip, USB charging cable)	RSM	PMMN4156
	Li-Ion 2150 mAh battery, IP68 rugged (with swivel clip)	Battery	PMNN4846
	WM800 dual unit charger with US Plug	Charging solution	PMPN4653
	Power Supply (US) for WM800 dual unit charger		PS000277A11
	USB-C charging cable		PMKN4294
	Low profile swivel clip with D-ring (10pcs per pack)	Carry attachments	PMLN8312
	Coiled lanyard (5pcs per pack)		PMLN8682
	Swivel molle clip for remote speaker microphone		PMLN8675
	N-ear 360 Flexo Dynamic™ Braided Fiber Cloth™ earpiece	Earpieces	PMLN8650
	Receive-only earpiece with coiled translucent tube, loud audio		PMLN8652

APX N portable radio accessories

COMPATIBILITY	ACCESSORY		FEATURES					
SURVEILLANCE ACCESSORIES AND EARPIECES								
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	IMPRES	EARPIECE TYPE	MICROPHONE	PTT	PROGRAMMABLE BUTTON	HAZLOC-CAPABLE†
APX N70 APX N50 APX N30	IMPRES™ 1-wire surveillance kit with translucent tube, loud audio, black	PMLN8341	•	Clear rubber eartip	•	•		UL
	IMPRES™ 2-wire surveillance kit with translucent tube, loud audio, black	PMLN8342	•	Clear rubber eartip	•	•	•	UL
	IMPRES™ 3-wire surveillance kit with translucent tube, loud audio, black	PMLN8343	•	Clear rubber eartip	•	•	•	UL
	IMPRES™ 2-wire swivel earhook with removable eartip, loud audio, black	PMLN8295	•	Removable black rubber eartip	•	•	•	UL
	IMPRES™ 1-wire single earbud with removable earhook, loud audio, black	PMLN8337	•	Single earbud	•	•		

COMPATIBILITY	ACCESSORY		FEATURES	
SURVEILLANCE ACCESSORIES REPLACEMENT KITS				
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	PROGRAMMABLE BUTTON	HAZLOC-CAPABLE†
APX N70 APX N50 APX N30	Replacement quick disconnect translucent tube with clear rubber eartip	PMLN8092	Clear rubber eartip	PMLN8120 PMLN8341 PMLN8342 PMLN8343
	Replacement rubber eartip, small (5 per pack)	PMLN8068	Black rubber eartip	PMLN8295
	Replacement rubber eartip, medium (5 per pack)	PMLN8069		
	Replacement rubber eartip, large (5 per pack)	PMLN8070		
	Replacement rubber sleeve, small (25 per pack)	PMLN8363	Black rubber sleeve Clear rubber eartip	PMLN8337
	Replacement rubber sleeve, medium (25 per pack)	PMLN8364		
	Replacement rubber sleeve, large (25 per pack)	PMLN8365		

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual provided with each UL-approved APX portable.

APX N portable radio accessories

COMPATIBILITY	ACCESSORY			FEATURES		
REMOTE SPEAKER MICROPHONE SECONDARY AUDIO ACCESSORIES						
RSMS	DESCRIPTION		PART NUMBER	EARPIECE TYPE	CONNECTOR TYPE	HAZLOC-CAPABLE†
WM800 XVP850 XVP830 XVP750 XVP730		Replacement translucent tube with rubber eartip for PMLN8120	**PMLN8092**	Clear rubber eartip	-	PMLN8120 PMLN8341 PMLN8342 PMLN8343
		Near 360 Flexo Dynamic™ Braided Fiber Cloth™ earpiece	**PMLN8650**	Clear rubber eartip	3.5mm	

COMPATIBILITY	ACCESSORY			FEATURES					
EARPIECES									
PORTABLE RADIOS	DESCRIPTION		PART NUMBER	IMPRES	EARPIECE TYPE	MICROPHONE	PTT	PROGRAMMABLE BUTTON	HAZLOC-CAPABLE†
APX NEXT XE APX NEXT		IMPRES 2-wire surveillance kit, programmable button, black	**PMLN6127**	•	Ear hanger	Mic and PTT combined on a single wire		•	UL
		IMPRES 2-wire surveillance kit with translucent tube, programmable button, black	**PMLN6129**	•	Clear rubber eartip	Mic and PTT combined on a single wire		•	UL
		IMPRES 2-wire surveillance kit with translucent tube, programmable button, beige	**PMLN6130**	•	Clear rubber eartip	Mic and PTT combined on a single wire		•	UL
		3.5mm threaded audio adapter	**BDN6783**		Not applicable	Not applicable	Not applicable	Not applicable	
		2-Wire surveillance kit with translucent tube, black, 3.5mm threaded. Requires BDN6783.	**RLN5312**		Clear rubber eartip	Mic and PTT combined on a single wire		Not applicable	

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual provided with each UL-approved APX portable.

APX N portable radio accessories

COMPATIBILITY	ACCESSORY		FEATURES									
HEADSETS												
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	HEADSET TYPE	EARPIECE STYLE	IMPRES	INTELLIGENT AUDIO	NOISE REDUCTION RATING	MICROPHONE	PTT	WEIGHT	IP RATING	HAZLOC-CAPABLE†
APX N70 APX N50 APX N30	Heavy duty behind-the-head headset with noise-canceling boom microphone (see user guide for replacement parts)	PMLN8085	Behind-the -head	Dual-muff	•	•	24 dB	Boom	On ear cup	Heavy duty	IP54	UL
	Heavy duty over-the-head headset with noise-canceling boom microphone (see user guide for replacement parts)	PMLN8086	Over-the -head	Dual-muff	•	•	24 dB	Boom	On ear cup	Heavy duty	IP54	UL

COMPATIBILITY	ACCESSORY		FEATURES						
3M PELTOR HEADSETS The 3M Peltor CH-3 Series is designed for industrial users working in high noise environments.									
PORTABLE RADIOS	DESCRIPTION	PART NUMBER	HEADSET TYPE	CONNECTOR TYPE	SPEAKER	NOISE REDUCTION RATING (NRR)	MICROPHONE	PTT (MOTOTRBO)	HAZLOC-CAPABLE†
PTT ADAPTER CONFIGURATIONS									
APX N70 APX N50 APX N30	CH-3 Series Over-the-Head Headset with Nexus Connector (See user guide for replacement parts)	PMLN8265	Over-the-Head	Nexus	Dual-Ear	26 dB	Boom	Requires PTT Adapter PMLN8297	
	CH-3 Series Neckband Headset with Nexus Connector (See user guide for replacement parts)	PMLN8266	Neckband	Nexus	Dual-Ear	24 dB	Boom	Requires PTT Adapter PMLN8297	
	CH-3 Series Hard Hat Attached with Nexus Connector (Hat not included) (See user guide for replacement parts)	PMLN8267	Hard Hat Attached	Nexus	Dual-Ear	24 dB	Boom	Requires PTT Adapter PMLN8297	
	PTT Nexus Adapter (Requires headset - options listed above)	PMLN8297	N/A	N/A	N/A	N/A	N/A	N/A	
	GCAI mini to GCAI cable adapter	PMLN8334	N/A	N/A	N/A	N/A	N/A	N/A	

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual provided with each UL-approved APX portable.

APX N portable radio accessories

COMPATIBILITY	ACCESSORY			FEATURES							
MOTOROLA IMPRES 2 BATTERIES WITH SELF CALIBRATION											
PORTABLE RADIOS	DESCRIPTION		PART NUMBER	IMPRES 2	CHEMISTRY	TYPICAL CAPACITY (MAH)	DIMENSIONS (MILLIMETERS) (H X W X D)	WEIGHT (MAX.GRAMS)	HAZLOC-CAPABLE†	IP RATING	OPERATING TEMPERATURE (DISCHARGE)
APX NEXT XN		IMPRES 2 Li-Ion 3400 mAh battery, IP68 rugged*	PMNN4812	•	Li-Ion	3400	117 x 64 x 42	280	UL	IP68 rugged	-20°C to +60°C
APX N70 XE APX N70		IMPRES 2 Li-Ion 3200 mAh battery, IP68 rugged*	PMNN4816	•	Li-Ion	3200	78 x 49 x 23	145		IP68 rugged	-20°C to +60°C
		IMPRES 2 Li-Ion 4400 mAh battery, IP68 rugged*	PMNN4817	•	Li-Ion	4400	83 x 49 x 27	200		IP68 rugged	-30°C to +60°C
		IMPRES 2 Li-Ion 3650 mAh battery, IP68 rugged*	PMNN4818	•	Li-Ion	3650	95 x 49 x 27	260	UL	IP68 rugged	-30°C to +60°C
APX N50 APX N30		IMPRES 2 Li-Ion 2850 mAh battery, IP68 rugged*	PMNN4813	•	Li-Ion	2850	117 x 49 x 15	115		IP68 rugged	-20°C to +60°C
		IMPRES 2 Li-Ion 3200 mAh battery, IP68 rugged*	PMNN4815	•	Li-Ion	3200	116 x 48 x 23	165	UL	IP68 rugged	-20°C to +60°C

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual provided with each UL-approved APX portable.

* APX N70, N50, N30 & APX NEXT XN batteries come with self-calibration feature when used with IMPRES 2 Single-Unit Fast Charger (SW ver V2.05 and above) and IMPRES 2 Multi-Unit Fast Charger (SW ver V2.05 and above).

[1]PMNN4818 available soon.

APX Next XN battery

What is self-calibration?

Selected IMPRES 2 batteries are equipped with the self calibration feature and can be identified through this logo on the battery label. These batteries do not require long hours of calibration or reconditioning process, when charged with:

- IMPRES 2 Single Unit Fast Charger (SW ver V2.05* and above)
- IMPRES 2 Multi Unit Fast Charger (SW ver V2.05* and above)

APX N portable radio accessories

COMPATIBILITY	ACCESSORY			FEATURES							
MOTOROLA IMPRES 2 BATTERIES											
PORTABLE RADIOS	DESCRIPTION		PART NUMBER	IMPRES 2	CHEMISTRY	TYPICAL CAPACITY (MAH)	DIMENSIONS (MILLIMETERS) (H X W X D)	WEIGHT (MAX. GRAMS)	HAZLOC-CAPABLE†	IP RATING	OPERATING TEMPERATURE (DISCHARGE)
APX NEXT XE APX NEXT		IMPRES 2 Li-Ion 4400 mAh Battery, IP68 rugged	NNTN9217	•	Li-Ion	4400	82 x 64 x 42	195	UL	IP68 rugged	-20°C to +60°C
APX NEXT		IMPRES 2 Li-Ion 4400 mAh Battery, IP68 rugged	NNTN9216	•	Li-Ion	4400	82 x 64 x 42	195		IP68 rugged	-20°C to +60°C

† HazLoc Details: For more information on which accessories are approved by Underwriters' Laboratory (UL) with certain APX models, please consult the manual provided with each UL-approved APX portable.

For IMPRES 2 battery care tips, please visit:
http://motorolasolutions.com/batterycare

Standard capacity

High capacity

Key features

- Built with highest energy density cells yet
- Backed by a 24-month capacity warranty[2]
- 48 month workmanship warranty

[1] 24 month capacity warranty applicable only when battery is maintained with IMPRES 2 chargers

[2] IP68 Rugged: APX NEXT radio with battery attached submerged in 2 meters of water for 4 hours

APX N portable radio accessories

COMPATIBILITY	ACCESSORY			FEATURES							
CHARGER SOLUTIONS Choose from a variety of solutions including single-unit, unique dual-unit, multi-unit, travel and vehicular chargers and be confident your radio is charged and ready to go the moment you need it.											
PORTABLE RADIOS	DESCRIPTION		PART NUMBER	IMPRES	CHEMISTRY	POWER SOURCE	DIMENSIONS (MILLIMETERS) (H X W X D)	NUMBER OF POCKETS	RECONDITIONING CAPABLE	CHARGING CURRENT (MAX.)	NUMBER OF DISPLAYS
SINGLE AND MULTI-UNIT CHARGERS											
APX NEXT XN APX NEXT XE APX NEXT APX N70		IMPRES 2 Single-Unit Fast Charger, US/NA 115V	PMPN4604	•	Li-Ion	115VAC	75 x 100 x 125	1	•	Fast	
		IMPRES 2 Multi-Unit Fast Charger with 6 Displays and 6 Integrated USB Charging Ports, US/NA 100-240V	PMPN4591	•	Li-Ion	100-240VAC	197 x 445 x 262	6	•	Fast	6
		Pocket to use with IMPRES 2 Multi-Unit Fast Charger	AS000178A02	Software upgrade is required if used with NNTN8844, NNTN9115. Reference the charger user manual to learn how to identify the charger SW version and perform update.							
		Wall Mount Bracket for IMPRES 2 Multi-Unit Chargers	NLN7967								
APX N50 APX N30		IMPRES 2 Single-Unit Charger, US/NA 115V	PMPN4820 PMPN4821 - EU, 240V PMPN4822 - UK/HK, 240V PMPN4823A - ANZ, 240V PMPN4824A - ARG, 240V PMPN4828 - IND, 100-240V PMPN4827 - BRZ, 100-240V	•	Li-Ion, NiMH	115VAC	51 x 88 x 94	1	•	Rapid Rate	
		IMPRES 2 Multi-Unit Charger, US/NA 100-240V	PMPN4594 PMPN4595 - EU 100-240V PMPN4596 - UK/HK 100-240V PMPN4597 - ANZ 100-240V PMPN4598 - ARG 100-240V PMPN4646 - IND 100-240V PMPN4600 - BRZ 100-240V	•	Li-Ion, NiMH	100-240VAC	117 x 444 x 170	6	•	Rapid Rate	1
		Pocket to use with IMPRES 2 Multi-Unit Charger	AS000130A01	Software upgrade is required if used with PMPN4284. Reference the charger user manual to learn how to identify the charger SW version and perform update.							
		Wall mount bracket for PMPN4594 Charger	BR000272A01								
APX NEXT XN APX NEXT XE APX NEXT		IMPRES 2 Single-Unit Fast Charger, US/NA 115V	NNTN9199	•	Li-Ion	115VAC	75 x 100 x 125	1	•	Fast	
		MPRES 2 Single-Unit Fast Charger, ANZ 100-240V	NNTN9259	•	Li-Ion	100-240VAC	75 x 100 x 125	1	•	Fast	
		IMPRES 2 Single-Unit Fast Charger, BRZ 100-240V	NNTN9204	•	Li-Ion	100-240VAC	75 x 100 x 125	1	•	Fast	
APX NEXT XN APX NEXT XE APX NEXT		IMPRES 2 Multi-Unit Fast Charger with 6 Displays and 6 Integrated USB Charging Ports, US/NA 100-240V	NNTN9115	•	Li-Ion	100-240VAC	197 x 445 x 262	6	•	Fast	6
APX NEXT XE APX NEXT		IMPRES 2 Multi-Unit Fast Charger with 6 Displays and 6 Integrated USB Charging Ports, ANZ 100-240V	NNTN9113	•	Li-Ion	100-240VAC	197 x 445 x 262	6	•	Fast	6
		IMPRES 2 Multi-Unit Fast Charger with 6 Displays and 6 Integrated USB Charging Ports, BRZ 100-240V	NNTN9114	•	Li-Ion	100-240VAC	197 x 445 x 262	6	•	Fast	6
APX NEXT XN APX NEXT XE APX NEXT		Pocket to use with IMPRES 2 Multi-Unit Fast Charger	NNTN9212								
		Wall Mount Bracket for IMPRES 2 Multi-Unit Chargers	NLN7967								
VEHICLE TRAVEL CHARGER											
APX NEXT XN APX NEXT XE APX NEXT APX N70		APX Next Vehicle Charger	PMPN4639	•	Li-Ion	12VDC Hardwire	82 x 97 x 200	1		Fast	

Charger Software version should be upgraded to v2.05 and above. Chargers can be updated to the latest software version using the MSI Charger Reprogrammer Installation Software. An installation guide is included in the software download package. https://www.motorolasolutions.com/en_us/products/two-way-radio-accessories/batteries/impres.html

*Fast = up to 3.0A Rapid Rate = up to 1.5A

APX N portable radio accessories

COMPATIBILITY	ACCESSORY			FEATURES	
CHARGER SOLUTIONS REPLACEMENT PARTS					
PORTABLE RADIOS	DESCRIPTION		PART NUMBER	POWER SOURCE	DIMENSIONS (MILLIMETERS) (H X W X D)
REPLACEMENT POWER SUPPLY AND POWER CORDS					
APX NEXT XN APX NEXT XE APX NEXT		Replacement power supply unit for IMPRES 2 single-unit fast charger, US/NA 115V	PS000040A01	115 VAC	
		Replacement power supply for IMPRES 2 single-unit fast charger, 100-240 VAC without power cord	PS000116A01	100-240 VAC	
		Power cord for IMPRES 2 multi-unit charger, US/CAN plug	3087791G01	2300	
		Power cord for IMPRES 2 multi-unit charger, AU/NZ plug	3087791G10	2300	
		Power cord for IMPRES 2 multi-unit charger, BZL plug	3087791G22	2300	
APX NEXT XN APX NEXT XE APX NEXT APX N70		Replacement power supply unit for IMPRES 2 single-unit fast charger, US/NA 115V	PS000040A02	115 VAC	
APX N50 APX N30		Replacement power supply unit for IMPRES 2 single-unit charger, US/NA 115V	25009297002	115 VAC	
		Replacement power supply unit for IMPRES 2 Multi-Unit Charger, 100-240 VAC without power cord	PS000242A01	100-240 VAC	
APX NEXT XN APX NEXT XE APX NEXT APX N70		APX vehicle charger battery adapter	PMPN4649	(To be used with APX NEXT vehicle charger, PMPN4639)	

IMPRES 2 multi-unit charger

Charge up to six APX NEXT XN, APX NEXT XE, APX NEXT, APX N70, APX N50 and APX N30 radios or batteries simultaneously for more efficiency.

- IMPRES 2 charging algorithms increase charge cycles up to 60% over non-IMPRES
- Provides up to 3A per pocket for faster charging
- Disable calibration mode or enable long term storage mode
- Optional wall mount kit NLN7967
- California Energy Commission (CEC) energy efficiency compliant