PG-60 Intelligent Dual-Mode Radio

4G Full Netcom PoC + 5W UHF Conventional Analog · User Manual

(Includes Analog Deep Parameters, Cross-Band Relay & Standalone Phone Setup)

[Dual-Mode Dual-Standby] 4G PoC + 5W Analog	[Dual PTT Controls] PTT1 PoC / PTT2 Analog	[Cross-Band Relay] PoC □ Analog Bridge	[Standalone Phone] 3x4 Keypad VoLTE Call	[One-Key Match / IP68] PC-Free Pair · Rugged

I. Product Overview & Key Features

The PG-60 is a high-performance 4G Full Netcom PoC (Public Network) + 5W UHF Conventional Analog dual-mode dual-standby two-way radio engineered for industrial manufacturing, security patrol, large-scale dispatch, emergency rescue, and cross-regional collaborative operations. Featuring IP68 dust & water resistance, it integrates nationwide unlimited-range PoC communication, local infrastructure-free analog intercom, cross-network signal relay gateway, standalone 4G phone dialing, GPS real-time positioning, and one-key frequency pairing into one rugged unit.

- 1. Dual-Mode Dual-Standby & Dual PTT Independent Controls: Equipped with dedicated PTT1 (PoC transmission) and PTT2 (Analog transmission). Both channels standby simultaneously without interference, allowing instant two-way transmission without menu toggling.
- 2. 5W High-Power Analog Radio Architecture: Covers UHF 400-470MHz with 16 programmable channels, standard & non-standard CTCSS/DCS sub-audio coding, DTMF ANI-ID identification, and full repeater offset functions.
- 3. Cross-Band Analog/PoC Relay Gateway (Cross-Band Relay): Functions as a portable mobile relay gateway, bridging local UHF analog signals to nationwide 4G PoC groups and vice versa in real time, eliminating traditional communication barriers.
- 4. Standalone 4G Cellular Phone Function: Built-in standard cellular mobile module allows direct phone dialing to mobile phones and landlines via the physical 3x4 keypad, featuring full-duplex hands-free conversation (requires a SIM card supporting voice calls).
- 5. One-Key PC-Free Frequency Matching (Cloning): Captures frequency and CTCSS/DCS sub-tones from nearby radios in analog mode without requiring PC programming software.
- 6. IP68 Rugged Waterproof & Dustproof Design: High-strength engineering chassis with high-capacity 7.4V Li-ion battery, built to withstand heavy rain, dust, and harsh industrial environments.

II. Package Contents & Hardware Overview

2.1 Package Contents

No.	Item Description	Qty	Specification & Function Notes
1	**Two-Way Radio Main Unit (PG-60)**	1 pc	4G+Analog dual-mode main body with color LCD & keypad
2	**High-Capacity Li-ion Battery**	1 pc	Rated 7.4V / 2500mAh standard rechargeable lithium pack
3	**Analog Antenna (UHF)**	1 pc	Standard SMA female high-gain UHF antenna
4	**4G Cellular Antenna**	1 pc	High-sensitivity full netcom cellular antenna
5	**Smart Desktop Charger + Adapter**	1 set	Rapid desktop charging dock + standard AC power adapter
6	**Heavy-Duty Belt Clip + Screws**	1 set	High-strength belt clip with mounting screws
7	**Hand Strap + User Manual**	1 set	Portable wrist strap + comprehensive user manual

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2.2 Controls & Physical Component Guide

• Top Panel: Power switch / volume control knob, dual antenna connectors (Analog SMA / 4G), dual-color status LED (Red: TX, Green: RX).

• Left Side Controls: PTT1 Button (Default PoC TX), PTT2 Button (Default Analog TX), Side Key 1 (Short press: Switch PoC/Analog focus; Long press: Announce PoC group members or monitor analog squelch).

• Front Control Area: 1.77-inch color LCD display, high-output speaker, sensitive microphone, 3x4 numeric keypad (including [FUN] Menu/Dial, [CLR] Back/Hang-up, [▲]/[▼] Navigation, [*] Mode switch, [#] Keypad lock).

• Right Side Interface: Standard Kenwood 2-Pin (K-Type) SP/MIC earphone & programming port with waterproof rubber cap.

III. Key Definitions & Screen Status Icons

3.1 Keypad Function Matrix

Key	Short Press Function	Long Press Function (~1.5s)
[FUN] Menu / Dial	Enter main menu / Confirm dial in phone mode	Analog mode: Launch One-Key Frequency Match
[CLR] Back / End	Exit current menu / Return / Hang up call	Clear entered numbers or text characters
[▲] Up Key	Analog: Step up freq/channel; Menu: Up	PoC mode: Quick access to [Group Select]
[▼] Down Key	Analog: Step down freq/channel; Menu: Down	PoC mode: Quick access to [Member Select]
[0] ~ [9] Numeric	Direct input of freq, channel, phone no. or menu	Trigger mapped shortcut functions (0~9)
[*] Mode Key	Input * symbol in menu / secondary toggle	Analog standby: Switch VFO Frequency / MR Channel mode
[#] Lock Key	Character input delimiter	Quick lock / unlock keypad against accidental touch

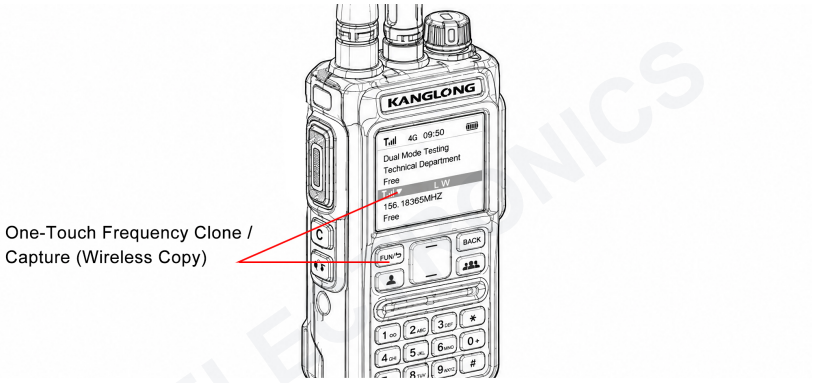
3.2 Core Screen Status Icons

Screen Icon	Icon Name	Status & Functional Description
	**Signal Bars**	Displays real-time 4G cellular network signal strength and bar level.
	**Focus Triangle**	Indicates active control focus on PoC public network (Top) or Analog band (Bottom) channel.
	**Battery Level**	Displays real-time remaining battery capacity (4 bars = 100% full charge).
	**Keypad Lock**	Indicates keypad is locked. Press and hold [#] key to unlock.
	**Phone Call**	Indicates active mobile phone call or dialing ready status.
	**Mode Switch**	In analog mode, press and hold [*] key to toggle between Channel Mode (MR) and Frequency Mode (VFO).
H / L	**Power Level**	H indicates Analog High Power (5W); L indicates Analog Low Power (1W).
W / N	**Bandwidth**	Indicates Analog channel is Wideband (W, 25kHz) or Narrowband (N, 12.5kHz).
+ / -	**Repeater Offset**	Indicates positive (+) or negative (-) repeater frequency offset is active.
RPT / □	**Relay Gateway**	Indicates Cross-Band Analog □ PoC Relay Gateway mode is activated.

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3.3 One-Key Frequency Match (3-Step Quick Guide)

Step	Action	Status & Display Indication
Step 1	**Switch Focus**	Switch to Frequency Mode (VFO), move cursor focus (▼) to Analog channel
Step 2	**Enter Clone Mode**	Long press [FUN] key for 3 seconds until screen displays frequency scanning screen
Step 3	**Transmit to Pair**	Hold target radio 30–50cm away, press and hold its [PTT] for 2–3s. PG-60 locks frequency and sub-tones; press [FUN] to save to channel.

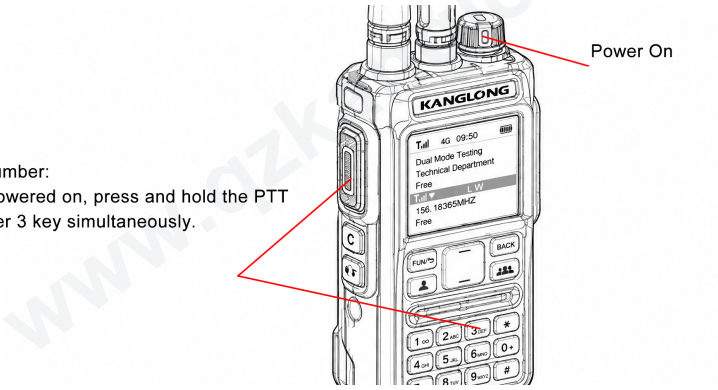


Preparation: Switch to Frequency Mode . Ensure the screen cursor (▼) points to the target Analog Channel.
Enter Clone Mode: Long-press the 【FUN】 key for 3 seconds until the device enters frequency capture mode.
Transmit Signal: Keep the target radio 30–50 cm away, press and hold its 【PTT】 key to transmit. The radio will automatically decode, display, and save the frequency and CTCSS/DCS tone.

3.4 Shortcut Combinations (Engineering Mode)

View Hardware IMEI Code & QR Code:

1. Turn off the radio (Rotate power knob to OFF);
2. Press and hold side [PTT Key] and keypad number [3] simultaneously;
3. While holding both keys, rotate power knob to switch ON;
4. The screen enters Engineering Mode, displaying QR code and 15-digit unique IMEI code for platform binding.



IV. Analog Radio Menu & Deep Parameter Settings

The PG-60 features a full-featured 5W professional analog radio core, supporting 24 comprehensive menu configuration items for seamless interoperability with legacy radio systems, repeaters, and multi-brand transceivers.

4.1 Analog Menu Reference Table (24 Complete Items)

No.	Menu Display	Function Name	Sub-Parameters & Description
1	**Scanning**	Analog Channel Scan	START scan to automatically search active signals in current band or channel list
2	**Mode Selection**	Operating Mode	Frequency Mode (VFO) / Channel Mode (MR) / Ch-Name Mode (Channel Name)
3	**TOT**	Time-Out Timer	OFF / 30s ~ 600s (30s step); prevents continuous TX overheating; recommended 180s
4	**Tone**	Repeater Pilot Tone	1000 / 1450 / 1750 / 2100 Hz; activates tone-burst amateur repeaters (1750Hz common)
5	**SQL**	Squelch Level	SQL-0 ~ SQL-9; higher level filters weak interference; recommended SQL-3 ~ SQL-5
6	**RX-CTCSS**	RX Analog CTCSS	OFF / CTC-67.0Hz ~ CTC-254.1Hz; opens speaker only when matched tone is received
7	**RX-DCSN**	RX Normal DCS	OFF / DCS-D023N ~ DCS-D754N; normal digital sub-tone squelch decoding
8	**RX-DCSI**	RX Inverted DCS	OFF / DCS-D023I ~ DCS-D754I; inverted digital sub-tone squelch decoding
9	**TX-CTCSS**	TX Analog CTCSS	OFF / CTC-67.0Hz ~ CTC-254.1Hz; encodes sub-tone to open receiver/repeater squelch
10	**TX-DCSN**	TX Normal DCS	OFF / DCS-D023N ~ DCS-D754N; encodes standard normal digital sub-tone
11	**TX-DCSI**	TX Inverted DCS	OFF / DCS-D023I ~ DCS-D754I; encodes inverted digital sub-tone
12	**TX-DTMF1**	TX DTMF Signaling 1	OFF / DTMF1~8 / DTMF+ANI / ANI-ID; prefix signaling sent upon pressing PTT
13	**TX-DTMF2**	TX DTMF Signaling 2	OFF / DTMF1~8 / DTMF+ANI / ANI-ID; suffix signaling sent upon releasing PTT
14	**POWER**	RF Output Power	HIGH (5W High Power) / LOW (1W Low Power); use LOW for short range to save power
15	**W/NA**	Wide / Narrow Band	WIDE (25kHz) / NARROW (12.5kHz); narrowband recommended for commercial use
16	**DUP**	Repeater Offset Direction	OFF (Simplex) / ADD (+ Offset: TX=RX+Offset) / RED (- Offset: TX=RX-Offset)
17	**OFFSET Freq**	Repeater Offset Value	0.000 ~ 119.995 MHz; frequency shift between TX and RX (e.g. 5.000MHz or 8.000MHz)
18	**Step Freq**	Tuning Step Frequency	2.5 / 5.0 / 6.25 / 10.0 / 12.5 / 25.0 / 50.0 kHz; tuning step size (12.5k / 25k typical)
19	**CH-MEM**	Channel Memory Save	Select target CH-01 ~ CH-16 to store current frequency, CTCSS, offset and power parameters
20	**CH-DEL**	Channel Delete	Select CH-01 ~ CH-16 to delete stored channel parameters
21	**DTMF-TM**	DTMF Transmit Duration	50ms / 100ms / 150ms / 200ms; duration of DTMF signaling pulses
22	**DTMF**	DTMF Code Group	8/1, 8/2 ... 8/8; select pre-stored DTMF encoding sequence
23	**ANI_ID**	Caller Identification	Custom alphanumeric ID code displayed on receiving radios
24	**Data Reset**	Factory Data Reset	Reset Setting (Settings only) / Reset Setting+CH (Settings and all stored channels)

4.2 Core Analog Operation Practical Guide

[Practice 1] Repeater Configuration (Example: RX 438.500MHz, TX 433.500MHz, CTCSS 88.5Hz):

1. Input RX Frequency: In Frequency Mode (VFO), enter 438500 directly on the keypad.

2. Set TX CTCSS Sub-tone: Press [FUN] -> Navigate to Item 09 [TX-CTCSS] -> Press [FUN] -> Select CTC-88.5Hz -> Press [FUN] to confirm.

3. Set Offset Direction: Press [FUN] -> Navigate to Item 16 [DUP] -> Select RED (- Offset, TX is 5MHz lower than RX) -> Press [FUN].

4. Set Offset Frequency: Press [FUN] -> Navigate to Item 17 [OFFSET Freq] -> Input 05.000MHz -> Press [FUN] to confirm.

5. Save to Memory Channel: Press [FUN] -> Navigate to Item 19 [CH-MEM] -> Select empty channel (e.g. CH-01) -> Press [FUN] to save.

[Practice 2] One-Key PC-Free Frequency Matching:

1. In analog standby mode, long press [FUN] for 2 seconds to enter frequency scanning mode.

2. Hold target radio 20–50cm away and press its PTT for 2–3 seconds.

3. PG-60 instantly captures and locks the target frequency and sub-audio tone. Press [FUN] to confirm and store directly to channel!

V. PoC (Public Network) & System Settings Menu

5.1 PoC Menu Overview (14 Comprehensive Categories)

No.	Menu Category & Label	Sub-Items & Detailed Functionality
1	**Group Selection**	Browse and switch 4G PoC groups bound to active SIM; support [▲]/[▼] keys or direct group number input.
2	**Single call selection**	Includes Member selection, Member search, and Friend selection for encrypted 1-to-1 individual calling.
3	**Network Settings**	Select 4G Only or Automatic network registration mode.
4	**Sounds settings**	Select Standard Sound or High Sound (4G HD Audio); High Sound is recommended for superior voice clarity.
5	**GPS settings**	GPS switch (ON/OFF), GPS upload interval (5s~60s), GPS information (Latitude/Longitude/Speed) for dispatch platforms.
6	**Temp call time**	Set individual call TX duration limit (15s/30s/60s/90s); automatically cuts off with alert tone to prevent channel jamming.
7	**Other settings**	Includes Work mode (PoC/Analog/Hybrid/Relay), Frequency edit, Clone, and Dual SIM management for advanced setup.
8	**Intercom tone**	ON/OFF; enables or disables PTT connection talk permit tone and roger end-of-transmission beep.
9	**Quick settings**	Maps custom shortcut functions to long-press actions on numeric keys 0~9.
10	**Firmware update**	Supports OTA (Over-The-Air) cloud firmware update detection and installation over 4G cellular network.
11	**Time Zone Settings**	Select system time zone (Default GMT+8); automatically synchronizes time with cellular base station.
12	**SIM dual wait**	Configures dual SIM standby mode: Dual standby / SIM1 only / SIM2 only; allows both SIM cards online simultaneously.
13	**SIM select**	Manually selects default active SIM card slot (SIM1 / SIM2) for PoC registration and phone calls.
14	**Device info**	Displays Device model, SN number, Firmware version, ICCID, IP address for warranty service and platform registration.

VI. Featured Function: Cross-Band Analog/PoC Relay Setup

The PG-60 features a powerful Cross-Network Gateway / Relay capability. Via an internal hardware audio routing matrix, it bridges traditional 5W UHF analog signals and nationwide 4G PoC cellular voice bi-directionally in real time.

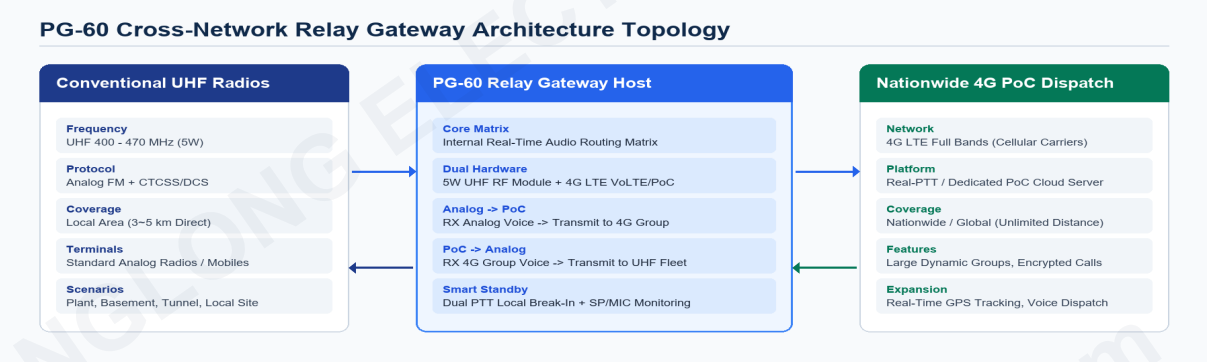
6.1 Three Relay Operating Modes

Navigate to [Digital Set] -> Item 06 [Other settings] -> [Transfer settings] to configure:

• Transit Off (Relay Disabled): Standard dual-mode independent operation. PoC and Analog operate separately without signal forwarding.

• Transfer Off (Unidirectional Off): Maintains local reception and tone alerts without active audio retransmission.

• Transfer and Intercom (Bi-Directional Relay + Intercom / Recommended): Full bi-directional bridge mode.
• Analog to PoC: Incoming UHF analog audio is automatically transmitted to the active 4G PoC group.
• PoC to Analog: Incoming 4G PoC voice automatically triggers the UHF analog transmitter to broadcast locally.
• Local Monitoring & Intercom: Local speaker outputs all audio, and the operator can intervene instantly via dual PTT keys.



6.2 Step-by-Step Relay Configuration Guide

1. Configure Analog Target: In analog mode, tune frequency and CTCSS to target repeater frequency (e.g. 435.500MHz, CTCSS 88.5Hz) and ensure it is saved to channel.

2. Select PoC Group: Long press [▲] to enter PoC group list and select target nationwide 4G talkgroup.

3. Enable Relay Mode: Press [FUN] -> Digital Set -> Item 06 Other settings -> Transfer settings -> Select [Transfer and Intercom] -> Press [FUN] to confirm.

4. Verify Status: Return to standby screen; the top status bar displays the active relay icon (RPT or □), indicating gateway readiness!

[Cross-Band Relay Operating Cautions]

1. Squelch & Sub-tone Protection: When relay is active, set analog squelch to SQL-3 ~ SQL-5 and configure RX-CTCSS tones to prevent background RF noise from triggering unintended continuous PoC transmissions!

2. Prevent Audio Feedback Loop: If multiple dual-mode radios operate at the same site, NEVER enable relay on two units simultaneously, as this creates an infinite audio feedback loop (Analog □ PoC □ Analog)!

3. Power & Cooling Recommendation: When deployed as a temporary fixed repeater for prolonged high-duty forwarding, connect to the desktop charger or an external 7.4V/Type-C power source and maintain proper airflow.

VII. Featured Function: Standalone 4G Phone Operation

The PG-60 is equipped with a full cellular mobile dialing interface. With a standard SIM card supporting voice calls, it functions directly as a mobile phone for outgoing and incoming calls.

7.1 Outgoing Call Procedure

1. Input Phone Number: In normal standby, enter target phone number directly via front 3x4 keypad. Press [CLR] to delete misdialed digits.
2. Initiate Call: Press front [FUN] key (Dial confirm). The system initiates 4G VoLTE call, displaying call icon □ and 'Calling...'.
3. Hands-Free Conversation: Once connected, speak directly into the microphone (Full-duplex hands-free conversation; no need to hold PTT).
4. End Call: Short press [CLR] key to hang up and return to radio standby mode.

7.2 Incoming Call Procedure

1. Incoming Ring: When a call comes in, the radio rings and screen displays phone icon □ and caller ID number.
2. Answer Call: Short press [FUN] key to answer in hands-free mode.
3. Reject / End Call: Short press [CLR] key to reject incoming call or terminate ongoing conversation.

VIII. Technical Specifications

Category	Specification Item	Technical Parameters
General Specs	Product Model	PG-60 Intelligent Dual-Mode Two-Way Radio
General Specs	Operating Mode	4G Full Netcom PoC + UHF Analog (Dual-Mode Dual-Standby Dual-PTT)
General Specs	Ingress Protection	IP68 Certified Dustproof & Waterproof
General Specs	Operating Voltage / Battery	Rated DC 7.4V / 2500mAh High-Capacity Li-ion Battery Pack
General Specs	Display Screen	1.77-inch High-Definition Color LCD
General Specs	Dimensions / Weight	120 × 57 × 38.5 mm / Approx. 331.5 g (with antenna & battery)
General Specs	Operating Temperature	-20°C ~ +60°C
4G Cellular Specs	Supported Bands	SE36NA (North America): FDD B2(25)/4/5(26)/12(17)/13/71, TDD B41 SE36A (Americas): FDD B1/B2/B3/B4/B5/B7/B8/B20/B66, GSM 850/900/1800/1900 SE36U (Europe): FDD B1/B3/B5/B7/B8/B20/B28, TDD B34/B38/B39/B40/B41, GSM 850/900/1800/1900 SE36M (Asia): FDD B1/B3/B5/B8, TDD B34/B38/B39/B40/B41
4G Cellular Specs	RX Sensitivity	LTE ≤ -96 dBm / WCDMA ≤ -108 dBm / GSM ≤ -106 dBm
4G Cellular Specs	Coverage / Platform	Nationwide / Global cellular network coverage / Supports Real-PTT & major dispatch platforms
Analog (UHF) Specs	Frequency Range	UHF: 400.000 ~ 470.000 MHz
Analog (UHF) Specs	Channel Capacity	16 Memory Channels / Full-band VFO Continuous Tuning
Analog (UHF) Specs	RF Output Power	≤ 30 dBm (5W High Power) / 1W Low Power Selectable
Analog (UHF) Specs	Modulation & Bandwidth	16KΦF3E (Wideband 25kHz) / 11KΦF3E (Narrowband 12.5kHz)
Analog (UHF) Specs	Sub-Audio & Impedance	CTCSS 50 groups + DCS 210 groups / Antenna Impedance 50 Ω (Standard SMA)

IX. Maintenance & Troubleshooting

Symptom	Possible Cause	Recommended Solution
Unable to Power On	1. Battery depleted; 2. Battery not locked in place; 3. Dirty/oxidized battery contacts.	Fully charge battery in desktop charger; reinstall battery until click lock is heard; clean contacts with dry cotton swab.

Symptom	Possible Cause	Recommended Solution
No SIM / No Network Prompt	1. SIM card reversed/loose; 2. Subscription expired; 3. Signal blind zone / basement.	Reinsert SIM firmly; check SIM data/voice status; move to open outdoor area.
Cannot Connect with Analog Radio	1. Frequencies mismatch; 2. Sub-tones CTCSS mismatch; 3. Accidental DUP offset active.	Verify operating frequency on both radios; disable or align CTCSS sub-tones; check DUP offset is set to OFF.
Relay Mode Not Triggering	1. Relay not set to Transfer and Intercom; 2. Squelch SQL set too high.	Check Other settings -> Transfer menu; lower squelch to SQL-3; verify PoC talkgroup is online.
Cannot Make Outgoing Calls	1. SIM does not support VoLTE voice (data-only SIM); 2. Failed to press [FUN] after entering digits.	Replace with standard voice-enabled mobile SIM; press [FUN] key after dialing digits to initiate call.

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