Digital DMR and Analog Dual Band Two Way Radio

Dual-Band DMR Digital and Analog Portable Radio

Instruction Manual

Preface

Thank you very much for choosing our Dual-Band DMR Digital and Analog Portable Radio. This radio is a Digital-Analog Dual-Band two way radios. For the needs of commercial customers such as engineering security, hotels, and various industrial and commercial complexes. The product is built on the basis of DMR standard digital, the body is wear-resistant and durable, and meets the needs of high-intensity communication. The 1.77" screen display and full keyboard design are convenient to operate, and have a wealth of digital application functions, strong battery life, excellent voice quality, and digitalization. Sound recording function, humanized one-key alarm and aesthetics. It has 5W high power, SMS, Record, Digital Encryption, Emergency Alert, Digital-Analog hybrid Scanning, Separate GPS, APRS position report, analog DTMF, 2TONE, 5TONE, CTCSS/DCS encoding/decoding, etc Business functions have become a powerful assistant for users in different industries to work and communicate.

To help you ward off bodily injury or property loss that may arise from improper operation, please read all the information carefully before using our products.

 ***NOTE:***

>> Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution.

>> When programming the radio, start by reading the factory software data, and then rewrite this data with your frequency etc., to a new saved code plug, otherwise errors may occur.

>> You can use the programming cable with a PC to program the frequency, channel type, power etc. your programming must comply with your FCC (or other country) license certification.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBIITED UNDER FCC RULES AND FEDERRAL LAW.

FCC Regulations

Federal Communication Commission (FCC) requires that all radio communication products should meet the requirements set forth in the above standards before they can be marketed in the U.S, and the manufacturer shall post a RF label on the product to inform users of operational instructions, so as to enhance their occupational health against exposure to RF energy.

FCC Licensing Information

The radio operates on Commercial/ Land Mobile frequencies which require a license from the Federal Communications Commission (FCC) for business, personal, education and recreational use. To obtain forms, call the FCC forms hotline at: 1-800-418-3676 or go to http://www. fcc.gov For questions concerning commercial licensing, contact the FCC at 1-888CALL-FCC (1-888-225-5322).

IC Statement

The device has been tested and complies with SAR limits, users can obtain Canadian information on RF exposure and compliance.

Après examen de ce materiel aux conformité aux limites DAS et/ou aux limites d'intensité de champ RF, les utilisateurs peuventsur l'exposition aux radiofréquences et la conformité and compliance d'acquérir les informations correspondantes

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

• This device may not cause harmful interference.

• This device must accept any interference received, including interference that may cause undesired operation.

Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le

fonctionnement.

EU Regulatory Conformance

As certified by the qualified laboratory, the product is in compliance with the essential requirements and other relevant provisions of the Directive 2014/53/EU. All applicable EU regulations are regarded (2006/66/EC, 2011/65/EU, 2012/19/EU). Please note that the above information is applicable to EU countries only.

European Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution. At this subject, refer to the "EU" specification guide 2014/53/EU.

RF Exposure Compliance and Control Guidelines and Operating Instructions

To control your exposure and ensure compliance with the occupational/controlled environmental exposure limits, always adhere to the following procedures.

Guidelines:

- Do not remove the RF Exposure Label from the device.
- User awareness instructions should accompany device when transferred to other users.
- Do not use this device if the operational requirements described herein are notmet.

Operating Instructions:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), press the Push-to-Talk (PTT) key. To receive calls, release the PTT key. Transmitting 50% of the time, or less, is important because the radiogeneratesmeasurable RF energy only when transmitting (interms of measuring for standards compliance).
- Keep the radio unit at least 2.5 cm away from the face. Keeping the radio at the proper distance is important as RF

exposure decreases with distance from the antenna. The antenna should be kept away from the face andeyes.

- When worn on the body, always place the radio in an approved holder, holster, case, or body harness or by use of the correctclip for this product.
- Use of non-approved accessories may result in exposure levels which exceed the FCC's occupational/ controlled environmental RF exposure limits. Use of non-approved antennas, batteries, and accessories causes the radio to exceed the FCC RF exposure guidelines.
- Contact your local dealer for the product's optional accessories.

Compliant Use

Our products are designed to provide reliable wireless communication services for users across many industry sectors. In order to use the products safely and to achieve the best performance, they must be used as intended. The operator of the product is responsible for damage to the product or damage caused by the product if the product was used beyond the intended use instructions.

Intended use includes that:

- The product is used by users who have full knowledge of its RF exposure and can exercise control over their RF exposure to meet the occupational limits in FCC/ICNIRP and international standards.
- All the security instructions set forth in this document are always heeded.
- The general, national and in-house safety regulations are heeded.
- The product is exclusively used with the frequencies licensed by the respective authority.
- The product is configured appropriately by the dealer.

Besides, intended use also requires the product operator to be well-trained and to be familiar with the applicable standards, regulations and provisions.

GENERAL SAFETY INFORMATION

RF Radiation Information

■ RF Radiation Profile

Radio Frequency (RF) is a frequency of electromagnetic radiation in the range at which radio signals are transmitted. RF technology is widely used in communication, medicine, food processing and other fields. It may generate radiation during use.

■ RF Radiation Safety

For function-related reasons, increased electromagnetic radiation may occur with specific products. Taking into consideration that unborn life is increasingly worthy of being protected, pregnant women should be protected through appropriate measures. People with personal medical devices such as cardiac pacemakers and hearing aids can also be endangered by electromagnetic radiation. The operator is obliged to assess workplaces with a considerable risk of exposure to radiation and to avert any hazards.
In order to ensure user health, experts from relevant industries including science, engineering, medicine and health work with international organizations to develop standards for safe exposure to RF radiation. Our product is designed and tested to comply with such standards, including:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR § 1.1307, 1.1310 and 2.1093
- American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE) C95 .1-2005; Canada RSS102 Issue 5 March 2015
- Institute of Electrical and Electronic Engineers (IEEE) C95. 1:2005 Edition

Precautions for Portable Terminals

Operating Prohibitions

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions:

1. Do not operate the product in a location containing fuels, chemicals, explosive atmospheres and other flammable or explosive materials. In such location, only an approved Ex-protection model is allowed for use, but any attempt to assemble or disassemble it is strictly prohibited.
2. Do not operate the product near or in any blasting area.
3. Do not operate the product near any medical or electronic equipment that is vulnerable to RF signals.
4. Do not hold the product while driving.
5. Do not operate the product in any area where use of wireless communication equipment is completely prohibited.

■ Important Tips

To help you make better use of the product, be sure to observe the following instructions:

1. Do not use any unauthorized or damaged accessory.
2. Keep the product at least 2.5 centimeters away from your body during transmission.
3. Do not keep the product receiving at high volume for a long time.
4. For vehicles with an air bag, do not place the product in the area over the air bag or in the air bag deployment area.
5. Keep the product and its accessories out of reach of children and pets.
6. Please operate the product within the specified temperature range.
7. Continuous transmission for a long time may lead to heat accumulation within the product. In this case, please keep it at a proper location for cooling.
8. Handle the product with care.
9. Do not disassemble, modify or repair the product and its accessories without authorization.

Precautions for Batteries

■ Charging Prohibitions

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions:

1. Do not charge or replace your battery in a location containing fuels, chemicals, explosive atmospheres and other flammable or explosive materials.
2. Do not charge your battery that is wet. Please dry it with a soft and clean cloth prior to charge.
3. Do not charge your battery suffering deformation, leakage and overheat.
4. Do not charge your battery with an unauthorized charger.
5. Do not charge your battery in a location where strong radiation is present.
6. Overcharge shall always be prohibited for it may shorten the life of your battery.

■ Maintenance Instructions

To help your battery work normally or prolong its life, be sure to observe the following instructions:

1. Accumulated dust on charging connector may affect normal charging. Please use a clean and dry cloth to wipe it on a regular basis.
2. It is recommended to charge the battery under 5℃~40℃. Violation of the said limit may cause battery life reduction or even battery leakage.
3. To charge a battery attached to the product, turn it off to ensure a full charge.
4. Do not remove the battery or unplug the power cord during charging to ensure a smooth charging process.
5. Do not dispose of the battery in fire.
6. Do not expose the battery to direct sunlight for a long time nor place it close to other heating sources.
7. Do not squeeze and penetrate the battery, nor remove its housing.

■ Transportation Instructions

1. Damaged batteries must not be transported.
2. To avoid short circuit, separate the battery from metal pars or from each other if two or more batteries are transported in one packaging.
3. The radio must be switched off and secured against switch-on, if the battery is attached.

The content of the shipment must be declared in the shipping documents and by a Battery Shipping Label on the packaging. Contact your hauler for the local regulations and further information.

TABLE OF CONTENTS

1. What's in the box

Unpack the radio carefully. We recommend that you identify the items listed in the following table before discarding the packing materials. If any items are missing or have been damaged during shipment, please contact the carrier or the dealers immediately.

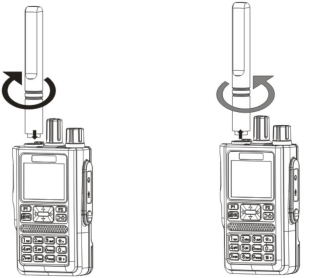
Standard Accessories

Item	Quantity(PCS)	Item	Quantity(PCS)
Radio	1	Belt Clip	1
Li-ion Battery Pack	1	Hand Strap	1
Battery Charger	1	Instruction Manual	1
Power Adaptor	1	Programming Cable	1
Antenna	1		

2. Assembly

Before the radio is ready for use we need to attach the antenna and battery pack, as well as charge the battery.

2.1 Attaching the Antenna



(1) Installing the Antenna: This transceiver is fitted with a Male SMA connector. To mount your antenna (Female SMA connector), align the two connectors and turn clockwise until it stops.

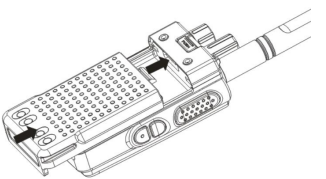
(2) Removing the Antenna: Turn the antenna counter-clockwise to remove it.

NOTE:

- Do not over-tighten your antenna to avoid damage to the connectors.
- When installing the antenna, don't grip it by the top. Grip by the base and turn.
- If you use an external antenna, make sure the SWR is about 1.5:1 or lower to avoid damage to the transceiver.
- Do not hold the antenna with your hand or wrap the outside of it to avoid bad operation of the transceiver.
- Never transmit without an antenna.

2.2 Attaching the Battery

Before attaching or removing the battery make sure your radio is turned off by turning the power/volume knob all the way counter-clockwise.



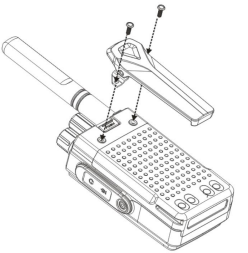
■Installation

(1) Make sure the battery is aligned in parallel with the radio body with the lower edge of the battery about 1-2cm below the edge of the radio.

(2) Once aligned with the guide-rails, slide the battery upward until you hear a click as the battery locks in place.

■Removal

To remove the battery, press the battery release above the battery pack, as you slide the battery downward.

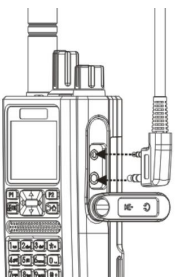


2.3 Attaching the Belt Clip

(1) Use a Phillips screwdriver to turn the screws counter-clockwise on the back of the radio and remove them.
(2) Align the screw holes on the belt clip with those on the back of the radio.
(3) Put the screws back in place as shown below, and use the Phillips screwdriver to turn the clockwise until hand tight.

2.4 Attaching the Speaker/Microphone (Optional)

Pry open the rubber MIC-Headset jack cover and then insert the Speaker/Microphone plug into the double jack.



■Accessory jack

The accessory jack is a Kenwood compatible two (2)-pin design.

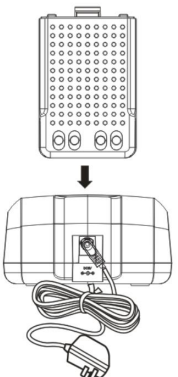
- ***To attach accessories such as headsets, speaker-mics or programming cables, align the connectors and push in fully.***
- ***The fit isn't always perfect on cheap or clone cables and connectors and may require a bit of force to wiggle them in completely.***
- ***Make sure the radio is off before attaching any accessories.***

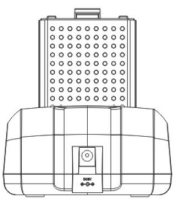
3. Charging and battery maintenance

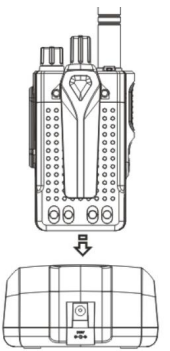
3.1 Charging the Battery

CAUTION

- ***Use the approved charger to charge the battery.***
- ***Read the Safety Information before charging.***
- ***Battery should be fully charged before initial use. Optimum battery efficiency will be achieved after the three full battery charge and discharge cycles.***
- ***Before initial use, fully charge the battery to ensure optimum performance.***







Follow these steps to hook up and use the charger:

(1) Plug the DC connector of the power adaptor into the charger base.

(2) Plug the AC connector of the power adaptor into a main AC wall outlet.

(3) Place the radio in the charging slot on the charger.

(4) Make sure the radio is making contact with the charger. When the red LED comes on steady, your radio is charging.

(5) The radio is fully charged once the charger's green status LED goes steady. Please remove the radio at that time to avoid over-charging your battery.

To determine the charging status, check the light-emitting diode (LED) indicator on the charger according to the following table:

Charger LED codes

Red LED	Green LED	Status
Flashing	Steady	Standby (charger empty) Error (charger with radio)
Steady	Off	Charging
Off	Steady	Charge complete.

NOTE: ***The charger and battery are fitted with matching notches so that you can charge your battery on its own!***

Practical if you have two batteries. That way you can charge one battery while still using your radio.

Radio should be turned OFF during charge cycle.

3.2 Battery Maintenance

The battery for your radio comes uncharged from the factory; please let it charge for at least four to five hours before you start using your radio.

NOTE:

- ***Use only batteries approved by the original manufacturer.***
- ***Never attempt to disassemble your battery pack.***
- ***Do not expose your batteries to fire or intense heat***
- ***Dispose of batteries in accordance with local recycling regulations. Batteries do not belong in your trashcan!***

3.3 Prolonging the life of your battery

- Only charge batteries in normal room temperatures.
- When charging a battery attached to the radio, turn the radio off for a faster charge.
- Do not unplug the power to the charger or remove the battery and/or radio before it's finished charging.
- Never charge a wet battery.
- Batteries wear out over time. If you notice a considerably shorter operating time with your radio, please consider purchasing a new battery.
- Battery performance will be reduced in temperatures below freezing. When working in cold environments, keep a spare battery on you. Preferably inside your jacket or in a similar location in order to keep the battery warm.
- Dust can interfere with the contacts on the battery. If necessary wipe the contacts with a clean cloth to ensure proper contact with radio and charger.

If your battery has become wet, remove it from the radio, wipe it dry with a towel and put it in a plastic bag with a handful of dry rice. Tie the bag up and let it sit over night. The rice will absorb any remaining moisture in the battery.

This method is only effective against minor splashes (light rain for instance). A soaked radio may very well be beyond repair.

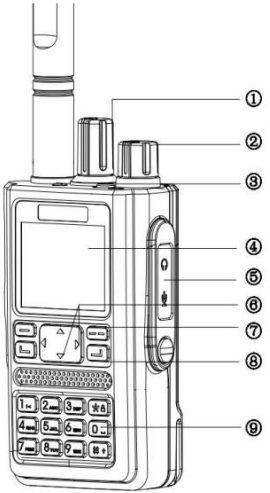
3.4 Storage

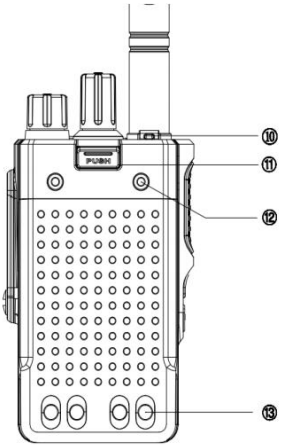
Partially charge your battery before long-term storage in order to prevent damage from over discharge. While lead acid must always be kept at full charge during storage, this radio uses a lithium-based battery and should be stored at around a 40 percent charge. This level minimizes age-related capacity loss while keeping the battery in operating condition and allowing self- discharge.

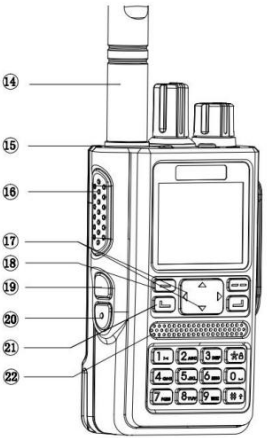
To avoid severe capacity degradation of your battery while in long-term storage, please cycle the battery at least every six (6) months.

Store your batteries in a cool and dry place, never above normal room temperatures.

4. Getting to know your radio







1. Encoder / channel selection knob

2.Power/Volume knob

3.TK- Top programmable function key

4. LCD

5. Speaker/Mic Jacks

6. θ Navigate the key down

7.  EXIT/BACK key

8. P2 -Programmable function keys

9. Keypad

10. Wrist Strap Hole

11. Battery release latch

12. Belt clip screw hole

13. Battery contacts

14. Antenna

15. Status LED

16. PTT key

17. π Navigate the key up

18. MENU/OK key

19. SK1 -Programmable side key

20. SK2 -Programmable side key

21. P1 -Programmable function keys

22. Speaker and microphone

4.1 Status indication

A. LCD icon summary

Icon	Description	Icon	Description
	Squelch Open/ Close Indicator		Digital Encryption On
	Battery level indicator		There is/are unread short message(s).
	Positioned successfully		The In Box is full.
	Position turn on, but the position has not been successful.		VOX enabled
	The radio transmits and receives through a repeater		Double Slot turn on
	Frequency shift direction if enabled in MR		Transmit power level indicator According to High Power
	Frequency shift direction if enabled in MR		Transmit power level indicator According to Low Power
	Monitor is turned on	**DCS**	DCS enabled
	Record function is turn on	**CT**	CTCSS enabled
	The radio is scanning		Scan stays on non-priority channels
VFO	Works in frequency mode	**1--64**	Memory channel

CH A	Under the call interface, TX or RX in A band	**CH B**	Under the call interface, TX or RX in B band
	The radiostaysonprioritychannel1.		The radiostaysonprioritychannel2.
	Digital mode, incoming call indication		Digital mode, call origination instructing
	Radio Silent turn on		Narrowband enabled（Analog mode）

B. Battery Level Indicator

When the battery level indicator reads  the battery is depleted. At this point the radio will start beeping periodically as well as flash the backlight of the display and when voice prompts are enabled, a "Low Voltage" announcement will be heard, indicating that you need to change your battery or put your radio in the charger.

Press the preprogrammed Battery Voltage Key to check the current battery voltage.

C. LED Indications

The top LED will help you to identify the current radio status.

LED Indicator	Radio Status
Glows red	Transmitting.
Glows green	Receiving.
Flashes orange slowly	Scanning

4.2 Programmed Key (SK1/SK2/P1/P2)

It is possible to set different functions for [SK1], [SK2], [P1], [P2] keys.
Method 1: In radio Menu - Settings - Radio Set - SK1, SK2, P1, P2 keys.
Method 2: In PC software – General Settings - Buttons.

Option	Functionality
None	No function is assigned to this button.
TX Power	To switch the power level between High and Low.
Emergency On	To initiate an emergency alarm. This is a recommended option for "TK Short".
Emergency Off	To end an emergency alarm. This is a recommended option for "TK Short".
Talk Around	To switch between Direct mode and Repeater mode.
Digi Encrypt	Choose the digital encryption group for digital channel
VOX	To enable or disable the VOX feature.
One Touch Call 1 ..... One Touch Call 5	To make a call or send a message to the preset contact or implement an auxiliary feature.
Message	To directly access the "Message" menu.
Contacts	Directly access the contact list to quickly initiate calls or related services.
Zone Up	To switch to the previous zone.
Zone Down	To switch to the next zone.
Zone Change	To Switch between the two zone.
Keypad Lock	To lock or unlock Keypad Auto Lock.
Man Down	To enable or disable the Man Down feature.
Monitor	To enable or disable the Monitor feature.
Battery Indicator	Check the current battery capacity voltage
Scan	To enable or disable the Scan feature.
Scan Backup	To switch scan backup. The scan function will be turned on automatically the next time the radio is turned on.
Record Switch	Enable/disable the recording function
Previous record	To playback the previous record.

Next record	To play back the next record.
TBST	To send out a 1750HZ tone-burst.
Nuisance Temporary Delete	To temporarily remove a currently unwanted channel from the scan list during scanning. The removed channel will not be scanned in subsequent scanning, but it will be restored into the scan list upon radio restart.
GPS Report	To upload GPS data to the control station a time when pressing the button (For details, please refer to GPS and GPS Trigger).
A/B Switch	To directly go back to the A/B screen.
Lone Worker	To enable or disable the Lone Worker feature.
GPS Info	Check the GPS position information

4.4 Shortcut Menu

Configure the shortcut menu for the radio through the CPS program software. The radio quickly enters the function  + number keys.

Option	Menu Select	Functionality
Call	Analog	Enables the One Touch Call function in analog mode.
	Digital	Enables the One Touch Call function in digital mode.
Menu	Message	Quick access to Messages in the menu
	New Message	Quick access to New Messages in the Menu - Messages
	Quick Text	Quick access to Quick Text in the Menu - Messages
	Inbox	Quick access to Inbox in the Menu - Messages
	Outbox	Quick access to Outbox in the Menu - Messages
	Contact list	Quick access to Contact list in the Menu - Contacts
	Manual dial	Quick access to Manual Dial in the Menu - Contacts
	Call Log	Quick access to Call Log in the Menu

	Outgoing	Quick access to Outgoing in the Menu - Call Log
	Incoming	Quick access to Incoming in the Menu - Call Log
	Missed	Quick access to Missed Calls in the Menu - Call Log
	Zone	Quick access to Zone in the Menu
	Radio set	Quick access to Radio Set in the Menu – Settings

5. Basic Use

Before we turn the power on, make sure you have attached the battery and antenna as described in Chapter 2, Initial setup.

5.1. Turning the unit on

Turn on the radio by turning the [Power/Volume] switch clockwise till a click is heard, and the LCD displays will show a start-up message, and you will hear a beep after 7 seconds. (**see "MENU > Settings > Radio Setting > Intro Screen"**).

■Turning the unit off

Turn the **Volume/Power knob** counter-clock wise all the way until you hear a "click". The unit is now off.

5.2. Adjusting the volume

To turn up the volume, turn the **Volume/Power knob** clock-wise. To turn the volume down, turn the **Volume/Power** knob counter-clock-wise. Be careful not to turn it too far, as you may inadvertently turn your radio off. The LCD display will show the volume status during an adjustment.

5.3. A/B Band Displays Switch

Press the pre-programmed **[A/B Switch]** key switches between A (upper) and B (lower) displays. The frequency or channel on the selected display becomes the active listening and transmit frequency or channel.

NOTE: The frequency band with bold letters and pointers is the main frequency band. The D on the pointer indicates the

digital mode, and the A on the pointer indicates the analog mode.

5.4. VFO/Channel Switch

There are two modes of operation: Frequency (VFO) mode, and Channel (MR) mode.

For everyday use, Channel (MR) mode is going to be a whole lot more practical than Frequency (VFO) mode. However, Frequency (VFO) mode is very handy for experimentation out in the field. Ultimately which mode you end up using will depend entirely on your use case.

Press and hold the key to switch between VFO and Channel display.

5.5. Locking or Unlocking Keypad

When the keypad is not in use, it is recommended that you lock it to avoid accidental operations.

To lock or unlock the keypad manually, do one of the following from the home screen:

• Press the pre-programmed **[Keypad Lock]** key.

• Press the key and then press **[*]**.

To allow the keypad to be locked automatically, enable the Keypad Lock feature as follows:

1. Press the (MENU) key enter main Menu > Settings > Radio Settings > Keypad Lock.
2. Select Enable, and set Delay Time by pressing the π/θ key.

To disable this feature, select Disable under the Keypad Lock menu.

NOTE: In addition, you can go to Menu> Settings> Radio Settings > Optional Key to set whether the corresponding keys and knobs still work when the keypad is locked.

5.6. Inputting via Keypad

You can input alias, contact numbers or messages via the keypad of the radio. Here are some useful tips:

• To switch the input method between alphabetic mode and numeric mode, press **[#]** key.

• To enter special characters, press **[1]** in alphabetic mode or **[*]** in numeric mode.

• To enter a space, press **[0]** in alphabetic mode.

5.7. Dual Watch

In certain situations, the ability to monitor two channels at once can be a valuable asset. You can either have one receiver in your radio and flip-flop between two frequencies at a fixed interval (known as Dual Watch), or you can equip a radio with two receivers (known as Dual Receive or Dual VFO). The former method is cheaper to implement and far more common than the latter.

The radio features Dual Watch functionality (single receiver) with the ability to lock the transmit frequency to one of the two channels it monitors.

Press and hold the key to switch between Dual Watch or Single Watch mode.

5.8. VFO Mode

Press and hold key to frequency (VFO) mode, and then press the pre-programmed **[A/B Switch]** key to switch to the main frequency band. The frequency can be set only when the frequency band is in the main frequency band (display "**Bold text with Arrow** ").

Method 1: Press the π/θ key to adjust the frequency at the preset step frequency. Each time you press, it will increase or decrease the frequency according to the step frequency preset by your radio.

Method 2: Input the frequency with the numeric keyboard.

The following example assumes a frequency step of 12.5 kHz. Input the frequency of 432.5625 MHz on the main band.

(1) Press and hold key to frequency mode (VFO).

(2) Press the pre-programmed **[A/B Switch]** key to select the main frequency band.

(3) Input **[4][3][2][5][6][2][5]** on the numeric keypad.

Note: You can switch between Digital mode and Analog mode by enter the main Menu > settings > channel parameter configuration > channel mode.

5.9. Select a Zone

Zones can facilitate the management of channels. A zone is a channel group in which multiple available channels are combined. To select a zone, do one of the following:

Method 1: Press the preprogrammed **[Zone Up]** or **[Zone Down]** key to switch to the selected zone.

Method 2: Press the (MENU) key enter main Menu > Zone, press π/θ key to select a Zone, and then press the key to select Apply.

5.10. Select a Channel

Press and hold key to channel (MR) mode. The channel can be Analog or Digital.

Method 1: You can use the π/θ keys to navigate between channels.

Method 2: Input the channel number through the numeric keyboard, and then press the key to enter the channel.

For example: If you want to switch to channel 64, Input **[6][4]** and keys to enter channel 64.

5.11. New Channel (Manual Program Channel)

Allow creation of New Channels. Method of creating a new channel:

(1) Press and hold key to channel (MR) mode.

(2) Press the (MENU) key enter main Menu ->Settings ->Chan Set ->New Chan.

(3) Select Analog or Digital Channel Type.

(4) Input the Channel Alias and confirm.

(5) Input the Receive Frequency and confirm.

(6) Input the Transmit frequency and confirm.

(7) Prompt "Add successful" and return to the previous menu.

■Add a New Channel to the Zone:

(1) Press and hold key to channel mode.

(2) Press the (MENU) key enter main Menu > Zone > Select a Zone and confirm.
(3) Press π/θ key to select "Add Channel".
(4) Press π/θ key to select the Newly Channel in the Channel List and confirm.
(5) Prompt "add successful" and return to the previous menu.

■New channel configuration parameters:

(1) Press and hold key to channel mode and select the Newly Channel.
(2) Press the (MENU) key enter main Menu ->Settings ->Chan Set ->New Chan.

- If it is an Analog Channel, you can set the Receive frequency, Transmit frequency, CTC/DCS, Radio ID, Alias, Bandwidth, etc.
- If it is a Digital Channel, you can set the Receive frequency, Transmit frequency, TX Contacts, RX Group List, Color Code, Time Slot, Radio ID, Alias, Double Slot, etc.

5.12. Call Services

When you are speaking during a call, keep the microphone about 2.5 to 5 cm away from your mouth. This ensures optimal voice quality on the receive radio.

5.12.1 Call on Digital Channel

You can initiate or receive the following types of calls on a digital channel:

-  Private call: a call from an individual user to another individual user.
-  Group call: a call from an individual user in a group to all the other members in the group.
-  All call: a call from an individual user to all the other users on the current channel.

5.12.1.1 Making a Call

You can make a call in any of the following ways:

■Preset Contact

(1) Channel mode press π/θ keys to select the desired channel.
(2) Press and hold the **PTT** key to call the preset contact for the selected channel.

■Contact List or Call Log

(1) Press the (MENU) key enter main Menu> Contact > Contact List or Call Logs> Outgoing/Incoming/Missed> Outgoing List /Incoming List/Missed List.
(2) Press the π/θ key to select the required contact.
(3) Press and hold the **PTT** key to call the selected contact.

■Manual Dial

(1) Press the (MENU) key enter main Menu> Contact > Manual Dial.
(2) Press **[#]** key to switch the display between the Private ID or Talk Group ID.
(3) Input a Call ID and press and hold the **PTT** key to make a call.

■One Touch Call

1. Press the preprogrammed **[One Touch Call]** Key.
2. Press and hold the **PTT** key to call the contact.

The radio displays  ,  ,  and for an outgoing Private call, Group call, and All call respectively.

5.12.1.2 Receiving and Responding to a Call

When receiving a call, you can listen to it without any operation.

The radio displays  ,  ,  and for an incoming Private call, Groupcall, and All call respectively.

You can press and hold the **PTT** key and speak within call hang time.

5.12.1.3 Ending a Call

The radio will end a call when the call hang time expires.

5.12.2 Call on Analog Channel

You can in itiate or receive a call on an analog channel with or without signaling.
A call without signaling is a call made to all the other users on an analog channel without signaling.
To initiate a call without signaling, do as follows:
(1) Channel mode press π/θ keys to select the required channel.
(2) Press and hold the **PTT** key, and speak in to the microphone.

5.13 Call with Frequency Mode

You can make digital or analog calls in frequency mode.
Press and hold  key to switch to VFO mode, enter the transmit frequency through the number keys, and initiate a digital call as in chapter 5.12.

5.14. Turn On or Off the Monitor

The Monitor feature allows the radio to receive weak signals.
To turn on or off this feature, press the preprogrammed [**Monitor]** key. The  icon will be displayed on the LCD when the

monitor function is turned on.

• During DMR digital monitoring, the Call ID, Color Code, Transmit Contact, and Call Type will be displayed.

Note: In analog mode, if there is no signal, noise will be emitted when you press the preprogrammed Monitor key.

5.15. DMR Emergency Call

Emergency is used to summon help in emergency situations. When an Emergency system is associated to a channel (Channel->Emergency System), the radio user can activate emergency through the programmed key.

This option allows you to choose the type of emergency. The option specifies the type of alert for the radio during emergency.

• **Disable:** The emergency feature is disabled.

• **Siren Only:** The radio will emit siren locally, but will not transmit any emergency signal to the control center.

• **Regular:** The radio gives visible and audible indications during emergency state.

• **Silent:** The radio gives no indication during emergency state.

• **Silent w/ Voice:** The radio gives no indication during emergency state, but will unmute its speaker once it receives a call.

• **Emergency/ Siren:** The radio transmits the emergency signals to the control center first, and then gives siren locally with visible indication.

NOTE: Emergency Call needs to be configured and enabled by your dealer.

5.15.1 Turn on the Emergency Alarm

Press the pre-programmed **[Emergency On]** key to initiate an emergency alarm to the preset contact.

5.15.2 Receive Emergency Alarm

When an emergency call is received, you can answer it without any action.

5.15.3 End Emergency Alarm

The caller can end the alarm in the following ways:
Method 1: Press the pre-programmed **[Emergency Off]** key.
Method 2: Turn off the radio.
The called party can exit the alarm prompt by switching channels or turn off the radio.

5.15.4 Lone Worker

This feature triggers off the Emergency mode if the user fails to have any Lone Worker Response Operation on the radio for a certain time period.
Press the pre-programmed **[Lone Work]** key to turn on the lone worker function.

5.16. Voice Operated Transmit (VOX)

The Voice Operated Transmit (VOX) feature allows you to transmit voice without pressing and holding the **PTT** key. The radio automatically transmits voice when the volume reaches the preset level. A higher gain level indicates lower sensitivity, which requires higher volume for triggering transmission.

5.16.1 Turn on or off VOX

Method 1: Press the pre-programmed **[VOX]** key to turn on or turn off the voice operated transmit (VOX) feature of the current channel.
Method 2: Press the (MENU) key enter main Menu > Settings > Radio Setting > VOX SW> On/Off, and then select On or Off.

5.16.2 Adjust Gain Level

To set the sensitivity of the microphone, Press the (MENU) key enter main Menu > Settings > Radio Setting > VOX > Gain Level, and then select the appropriate level. A total of 9 levels are provided.

5.17. Encrypt Service

With the digital encryption, the radio can encrypt of decrypt Encrypt Service. Both parties of Encrypt Service must enable the Encrypt feature. For example, Radio A transmits the encrypted voice to Radio B, and Radio B should enable the Encrypt feature to receive the voice.

A total of 16 types of digital encryption are provided, which can be basic encryption or full encryption, and support encryption keys **(8-bit and 14-bit, Character string composed of numbers (0-9) and English letters (A-F)**. Encrypt is programmed through PC software and configured to the digital channel.

Press the pre-programmed **[Encrypt]** key to turn on or off the encryption function.

In normal mode, turning on encryption means turning on encryption for the current channel. When switching to this channel, the terminal will automatically enable encryption.

6. Working the menu system

This product has a menu automatic exit function, if you do not perform any operation on the menu within the pre-programmed time (configured by the dealer), the product will automatically return to the standby interface. You can modify the menu hang time through the dealer.

- *In DMR Digital and VFO modes, there is none Zone menu.*
- *In Analog and VOF mode, only Scan and Settings menu.*
- *In DMR Digital and Channel (MR) modes, there is none menu for analog attributes such as CTC/DCS, Squelch, Bandwidth, Freq Step.*
- *In Analog and MR mode, there are only menus for Scan, Zone, and Settings, and none menus and submenus for DMR function attributes.*

■Basic use

Using the menu with arrow keys

(1) Press the  key to enter the Menu.
(2) Use the π/θ keys to navigate between menu items.
(3) Once you find the desired menu item, press  key again to select that menu item.
(4) Use the π/θ keys to select the desired parameter.
(5) When you've selected the parameter you want to set for a given menu item;
a. To confirm your selection, press  key and it will save your setting and bring you back to the previous menu.
b. To cancel your changes, press  key and it will reset that menu item.
(6) To exit out of the menu at any time, press the  key.

■Using the menu with short-cuts

(1) Press the  key to enter the Menu.
(2) Use the numerical keypad to enter the number of the menu item.
(3) To enter the menu item, press the  key.
(4) For entering the desired parameter you have two options:
a. Use the arrow keys as we did in the previous section; or
b. Use the numerical keypad to enter the numerical short-cut code.
(5) And just as in the previous section;
a. To confirm your selection, press  key and it will save your setting and bring you back to the previous menu.
b. To cancel your changes, press  key and it will reset that menu item.
(6) To exit out of the menu at any time, press the  key.

6.1. Contacts

■Contacts Type

 **Private Call:** A call between two individual radios.

 **Group Call:** A call from an individual radio to a group of radios.

 **All Call:** A call from an individual radio to all radios in the system. All Calls do not communicate through special timeslots or channels within the system. All Call will only be authorized to the users who play supervisory roles. This feature is very useful when a supervisor needs to communicate with all the users on a logical channel, rather than just a particular group or individual.

■Call ID

This allows users to set an ID for each digital call member. This ID is used to identify and communicate with a target radio or group of radios depending on the call type. There are three call types (Group Call, Private Call, All Call). The meaning of the call type's ID is explained as follows:

- Group Call ID-This ID is used to identify a particular group (ID range of 1-16776415).
- Private Call ID-This ID is the Radio ID of the target radio (ID range of 1-16776415).
- All Call ID-This has a fixed ID of 16777215.

■Call Alias

Users can set alias for each contact. Users may enter up to 16 English Unicode characters or 8 Chinese Unicode characters at maximum.

6.1.1 Contacts List

Contacts list shows contact information saved in the radio, users can select target radio or a group of radios depending on the call type and call ID. Up to 800 contacts can be saved.

Press the — key go to main Menu -> Contacts -> Contacts List and press the π/θ key to select the target contact.

 **Private Call**: You can View Details, Edit, Delete, Send Messages, and Apply advanced functions, such as Radio Check, Alert Call, Remote Monitor, Kill and Wake of radio.

 **Group Call**: You can View Details and Send Messages.

 **All Call**: You can View Details.

Or:

Press and hold the **PTT** key to make a call to the contact.

6.1.2 New Contact

To add a contact to the Contact List, do as follows:

1. Press the — key go to main Menu > Contacts > New Contact > Input ID/Edit ID.
2. Enter the ID using the keypad, and then press the — key.
3. Select Input Alias /Edit Alias, and enter the alias using the keypad.
4. Press the — key, and then select Save.

6.1.3 Manual Dial

You can input the Private ID to make a call. You can switch to Private Call or Group Call by press **[#]**, and the LCD will display the Call Type (Private ID/ Talk Group ID). Input the Private ID, press Option to access the advanced features.

(1) Radio Check

Select Check Radio, and it will send out a radio check to the target radio which will send back a message if it is available or not available to the transmit radio. With this feature, you can determine if another radio is active and powered on in the system.

(2) Alert Call

Select Call Alert, it will send out a call alert, the target radio will sound a beep or vibrate when receiving the call alert, and it will return a success call or failed call message to the transmit radio.

(3) Remote Monitor

Select Remote Monitor and it will send out a signal for the target radio will turn on its microphone and transmit when receiving the signaling, it will send back the voice to the transmit radio. With this feature you can monitor the sound activity near the target radio remotely.

(4) Kill

Select Kill, and it will send out a kill signaling to the target radio which will be killed (No display, no operation) when receiving the signaling and it will send back a kill successful message to the transmit radio.

(5) Wake

Select Wake, and it will send out a wake signaling to the killed radio and the target radio will return to standby when it receives this signaling and send back a Wake successful message to the transmit radio.

(6) Ranging

When caller and receiver both GPS positioned, if the caller turn on ranging function and the receiver is within communication range, Tx radio will detect the distance and direction between two radios at fixed interval, and then show the information on the display of Tx radio. **(Refer to page 66)**

6.1.4 CSV Contacts

This product can import up to 50,000 CSV Contacts.
This menu allows you to view the CSV Contact List; you can perform the following operations:
• View the detailed information of a contact in the CSV Contact List.
• Carry out Send Message, Alert Call, Radio Check, Remote Monitor, Kill and Wake of the radio.
• Press and hold the **[PTT]** key to make a call to the contact.

(1) CPS Programming CSV Contact

Through CPS software ->DMR Services ->Digital Contact, program the Call Alias, Call Type, Call ID, Call Alert, Repeater Number, City, State/Prov, Country, Remarks and write them into the radio.

(2) Import CSV contacts

You can also import the external CSV Contacts List through CPS software ->Tool->Import->Digital Contact List and write it to the radio.

(3) CSV Contacts shortcuts

Digital mode, short press **[#]** key to input ID numbers and quickly query CSV Contacts. You can quickly match the associated CSV Contact by input the ID.

6.2. SCAN

The Scan feature allows you to listen to activities on a channel, keeping track of your team members. With this feature enabled, the radio searches the scan list preset for the current channel and stays on a channel with activities.

6.2.1 Turn On/Off Scan

Method 1: Press the pre-programmed **[Scan]** key to turn on the Scan Feature.

Method 2: A certain channel has enabled the "Auto Start Scan" feature and configured a Scan List. When switching to this channel, the radio will automatically start scan.

Method 3: To turn on or off the Scan feature, Press the key go to main Menu > Scan> Scan On/Off, and then select On or Off.

With the Scan feature enabled, the radio displays, and the LED indicator slowly flashes orange. When detecting activities on a channel, the radio stays on it, and the LED indicator glowsgreen. When the radio stays on a non-priority channel, it displays .When the radio stays on a priority channel 1or 2, it displays or .

Exit Scan

Method 1: Scanning status, press pre-programmed **[Scan]** key to exit.

Method 2: Press the key go to main Menu > Scan> Scan On/Off, and then select off scan.

Method 3: When the Auto Scan channel is turned on, just change the channel, just change the channel.

6.2.2 Edit Scan List

(1) Press the key go to main Menu > Scan > Scan List.

(2) Press π/θ key to select a Scan List, and then press key to enter the Scan List Sub-Menu. Make the following settings:

- **Apply:** Enable the current scan list.
- **Edit/View:** Edit the current list, Add or Delete scan channels for the current list, and set priority scan channels.
- **Set priority channel**

You can set the currently channel as a priority channel or a non-priority channel. Priority channels are scanned more frequently than non-priority channels. Up to two priority channels can be set in each scan list. P1 represents priority channel 1, and P2 represents priority channel 2.

- **Remove Channels from the Scan List**

Select "Delete" to delete it from the Scan List. But you cannot delete the first channel in the Scan List.

6.2.3 VFO Scan Range

When in Frequency (VFO) mode, the start frequency and end frequency of the sweep range can be set precisely (unit MHz).
(1) Press the key go to main Menu -> Scan -> VFO ScanRange (VHF)
(2) Press the key to enter the VHF band scan range settings.
(3) Enter the Scan Range through the numeric keyboard, such as the scan range 144-146MHz, input **[1][4][4][1][4][6].**
• ***In the same way, set the scan range of the UHF band.***

6.2.4 Scanning modes

In VFO mode, the scanner is configurable to one of three ways of operation:
(1) Time operation
When scanning and stopping for a signal, stays at the channel 5s before resuming the scan.
(2) Carrier operation
When scanning and stopping for signal, stays at the channel until the signal disappears, and resumes scan 2s later.
(3) Search operation
When scanning and stopping for a signal, will terminate the scan. This function is only valid for a VFO scan.

6.3. Zone

Note: VFO mode has none Zone menu.

6.3.1 Select a Zone

A Zone is a group of channels grouped together. The radio has 250 Zones. A Zone can have the maximum of 64 analog and/or digital channels.
Method 1: Press the pre-programmed **[Zone Up]**/ **[Zone Down]/ [Zone Change]** key to quickly select a zone.
Method 2:

(1) Press the (MENU) key enter main Menu > Zone.
(2) Press the π/θ key to select a zone in the zone list, Press the key to enter.
(3) Press the π/θ key to select the 'apply' option. Press the key to save and return to the previous menu.

6.3.2 Add Zones

(1) Press the (MENU) key enter main Menu > Zone > Add Zone.
(2) Press the key to enter，enter the Zone name through the keyboard, and press the key to delete it bit by bit.
(3) After edit the Zone name, press to save.

6.3.3 Channel Added to Zone

The added zone only defaults to "Channel 1", you can add channels to zone.
(1) Press the (MENU) key enter main Menu > Zone.
(2) Press the π/θ key to select a zone in the zone list. Press the key to enter.
(3) Press the π/θ key to select the 'add channel' option. Press the key to enter.
(4) Press the π/θ key to select one of the channels in the channel list, press the key to save and return to the previous menu.

Note: Repeat the above operation, you can continue to add channels, each area can add up to 64 channels.

6.4. Messages Services

Here Message refers to Quick Text. Users can choose to create a new message, save a message to the radio or send/receive a message to/from other users using the radio menu. Under this menu entry, the following options are available:
(1) InBox: Received messages are stored in the InBox of the radio automatically. It can save the last 20 messages. This option allows the user to edit or forward these messages from the radio's menu.
(2) New Msg: This option allows users to create a new message using the radio's menu. Each message contains up to 128 characters. For the created messages, users can to send it or save it to the radio's memory.

(3) OutBox: The sent messages are stored in the OutBox of the radio automatically. It can save the last 20 messages.
(4) Quick Text: This option allows users to access the Quick Text feature where the predefined text templates are saved (maximum of 25 items). Users can choose to insert any of the templates when creating a new message.
(5) DraftBox: The draft messages are stored in the radio automatically. It can save the last 100 messages. This option allows the user to edit or forward these messages using the menu.

6.4.1 Viewing a Message

To view received messages or sent messages, do as follows:
(1) Press the key, and then go to Message > InBox/OutBox > InBox List/OutBox List.
(2) Select the required message.

6.4.2 Sending a Message

You can send a message or a quick text message, forward a message from the InBox or OutBox, and resend a message from the OutBox.

6.4.2.1 Sending a New Message

(1) Go to Menu > Message > New Msg, and then type the text using the keypad.
(2) Press the key, and then select Send.
(3) Select the target contact, and then press the key.

6.4.2.2 Sending a Quick Text Message

A quick text message is a frequently used message predefined by your dealer. To send a quick text message, do as follows:
(1) Press the key, and then go to Message > Quick Text.
(2) Select the required quick text, and then press the key.
(3) Select Send, and then select the target contact.
(4) Press the key.

6.4.3 Deleting a Message

To delete a message from the InBox or OutBox, do as follows:
(1) Go to Menu > Message > InBox /OutBox > InBox List /OutBox List.
(2) Select the required message, and then press the key.
(3) Select Delete, and then press the key.
To delete all messages from the InBox or OutBox, do as follows:
(1) Go to Menu> Message > InBox/OutBox.
(2) Select Delete All, and then press the key.

6.5. Call Logs

This menu entry allows users to view recent call records from the menu. Under this entry, there are three options available:

6.5.1 Missed Calls:

This option allows the user to access the last 20 incoming private calls that the user missed or failed to respond to using the radio's menu. This call log also provides a quick way for the user to initiate a private call.

6.5.2 Received Calls:

This option allows users to track the last received private call numbers (maximum of 20 items). In addition, it also provides an easy way for redial access.

6.5.3 Dialed Calls:

This option allows users to track the last dialed private call numbers (maximum of 20 items). In addition, it also provides an easy way for redial access.

You can perform the following operations on any call record in the call record list:

• Press and hold **[PTT]** to making a call;

• Send Message.
• Delete a call log.

6.5.4 Delete a Call Logs

To delete a call logs from the Dialed Calls, Received Calls or Missed Calls, do as follows:
(1) Go to Menu > Call Logs > Dialed Calls/ Received Calls/ Missed Calls> Dialed Calls List/ Received Calls List/ Missed Call List.
(2) Select the required call logs, and then press the key.
(3) Select Delete, and then press the key.
To delete all call logs from the Dialed Calls/ Received Calls/ Missed Calls, do as follows:
(1) Go to Menu> Call Logs >Delete > Dialed Calls/ Received Calls/ Missed Calls.
(2) Press the key; delete all Dialed Calls/ Received Calls/ Missed Calls.

6.6. Settings

The setup menu is divided into three parts: Radio Settings, Channel Set, and device information. The Radio Settings as a public setting and the Channel Set is only used for the current channel parameter configuration.

6.6.1 Radio Setting

6.6.1.1 Talk Around

This option allows radio to communicate when there is no repeater available when the repeater is out of range or when the repeater is down. When this is selected either via the programmable button or the radio menu, the radio uses a receive frequency to transmit but it still allow radio in repeater mode to receive signal from the Talk Around operated radio.
• **On:** The user can use the Talk Around function on the current channel. When the Talk Around is enabled, the icon is displayed on the screen.
• **Off:** The Talk Around is prohibited in the current channel.

Note: After enabling the disconnection function, press the pre-programmed [Talk Around] key to activate this function. The analog channel will use the RX frequency as TX/RX frequency, the RX CTCSS/DCS decode as TX CTCSS/DCS encode.

6.6.1.2 Alert Tones

Users are allowed to set alert tone related parameters:
(1)**Radio Silent**：This option allows users to decide whether the radio shall operate in silent/non-silent mode. If user chooses *Silent On*, the radio will remain silent with no alert tones throughout radio operation.
(2) **Keypad Tone**：This option allows users to configure whether to emit an alert tone when pressing any keypads (includes topkey, sidekey and frontkey).
(3) **Message Tone**：This option allows users to configure whether to emit an alert tone when receiving a text message.
(4) **Group Call Tone**：This option allows users to configure whether to emit an alert tone when receiving a group call.
(5) **Private Call Tone**：This option allows users to configure whether to emit an alert tone when receiving a private call.
(6) **Call End Tone**：This option allows the user to set whether the radio sounds an alert tone after it stops receiving.
(7) **Talk Permit Tone**：This option allows users to configure whether to emit an alert tone upon a PTT press on current channel.
(8) **Voice Notify Tone**：This parameter allows you to set whether the radio makes the voice announcement when the radio user switches the zone or channel/personality via the menu or by rotating the **Channel Selector** knob**.**
(9) **Power On Tone**：This option allows users to set whether the radio will sound a tone when it is powered up.
(10) **Battery Low Tone**：This option allows users to configure whether to emit a warning tone when the radio's low battery threshold is reached.

6.6.1.3 TX Power

Set up the TX power for current channel.

- **High Power**: The **H** icon is displayed.
- **Low Power**: The **L** icon is displayed.

Note: To switch between High Power and Low Power by press pre-programmed [TX Power] key.

6.6.1.4 Backlight

(1) Backlight Level

LCD backlight brightness is adjustable in 6 steps.

Note: The backlight brightness is too bright; it will affect the battery working time.

(2) Backlight Time

Always: The backlight is always on.

5S -30S adjustable.

Note: This function is valid when turn off the power saves.

6.6.1.5 Intro Screen

- **Picture:** The radio will display a preset picture when powered on.
- **Char String:** The radio will display the characters set up in PC software when powered on.

6.6.1.6 Keypad Lock

- **Manual Lock:** Long press the [*] key to lock the keypad. Press key, then press the **[*]** key to unlock the keypad.
- **Auto Lock:** Radio will auto lock the keypad when standby for a while. Press key, then press the **[*]** key to unlock the keypad.

• **Keypad Delay Time:** This option allows users to choose the Keypad Auto Lock Delay Time. The radio will lock the keypad automatically if no operation is made within this time period. Range: 5 – 60 seconds

6.6.1.7 Language

Choose the Chinese or English.

6.6.1.8 LED Indicator

This option allows users to enable/disable all LED indications.
• **Off：** All LED indicators are turned Off throughout radio operation.
• **On：** LED indicator is turned On according to features operation.

6.6.1.9 VOX

Enable the VOX; you can speak into the microphone to start transmit instead of pressing the **[PTT]** key.
A total of 9 levels are provided. The larger the value, the lower the sensitivity.

6.6.1.10 TX Timer

This feature provides a safety switch that limits transmission time to a programmed value.
• **15-495S:** in 15 second steps. The TX will be limited in the set time. When this time is reached, the radio will auto stop transmission.
• **Off:** Turn off the TX Time limit, and there is no limit for the transmission time.

6.6.1.11 Clock

The real-time clock is used to display the local time in real time and to develop related functions based on the time. For example, Message time, Call Logs time, Record time, etc.

(1) Time

Allows manual setting of hours/ minutes/ seconds. Use the π/θ keys to move the cursor, and enter the value with the numeric keyboard.

(2) Date

Allows manual setting of year/ month /date. Use the π/θ keys to move the cursor, and enter the value on the numeric keyboard.

(3) Display Timer

- **On:** The real-time clock is displayed at the bottom of the display.
- **Off:** None time is displayed at the bottom of the display.

6.6.1.12 Private Call Match

- **On:** Need to match the DMR ID of the **Private Call**.
- **Off:** Ignore the matching of the DMR ID of the **Private Call**, and directly receive and respond to **any calls** with the same frequency/Color Code.

6.6.1.13 Group Call Match

- **On:** Need to match the **Group Call** ID during **Group Call**.
- **Off:** Ignore the matching of **Group Call** during **Group Call**, and directly receive and respond to **any calls** with the same frequency/color code.

6.6.1.14 GPS Position Function (optional with installed GPS)

This device supports American GPS, China Beidou position systems. After the position function is turned on, the power consumption of the whole machine will increase by about 30mA. Please turn on or off the position function according to actual needs. The position function needs to be used outdoors or near windows.

• When the position function is turned on, but the position information has not been obtained, the icon displayed on the LCD.

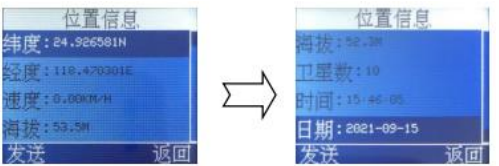
• The position information has been obtained. With the icon displayed on the LCD, you can view the current position details of device (including longitude, latitude, time, date and number of satellites, etc.).

(1) Turn on GPS

Press the (MENU) key enter main Menu ->Settings -> Radio Settings -> GPS ->GPS On/Off.

(2) Position Information

Method 1: Press the preset **[GPS info]** key to quickly enter the Position view.
Method 2: Press the key go to main Menu -> Settings -> Radio Settings -> GPS -> Position.



GPS 位置查看信息

Note: ***If the GPS is not positioning, the GPS icon shows a grey color. Move the radio to an open window or outdoors, and it will take a few minutes to connect to the GPS Satellites.***

(3) Send GPS Information

A. When the GPS is positioning successfully, the GPS icon shows a red color. Follow the above step to check the GPS info, press edit key to Text edit.
B. Press Confirm, and it will display Send or Save. If you select Save, the GPS info will be saved as a draft message.
C. Choose Send and it will display Contact list or Manual Dial.
D. Select Contact list to choose a contact, press select to send the GPS info. or
E. Select Manual Dial, input the DMR ID, press #↑ key to switch group ID or private ID, press — to send the GPS info.

6.6.1.15 APRS Location Reporting (Supported by GPS)

Turn APRS Receive, if both radio GPS is positioned, the radio will display the other radio's distance and position when radio is receiving.

(1) Turn on APRS

Press the — (MENU) key enter main Menu ->Settings -> Radio Settings -> APRS ->APRS On/Off -

(2) Interval time

The interval between two reports. Range 0-7200S, step 30S, default 30S.

(3) APRS Information

A. Press the — (MENU) key enter main Menu> Settings >Radio Settings >APRS >APRS Info.
B. Press π/θ keys to select an item.
C. Press the — key to show the received APRS information.

(4) Delete Information.

查收到目标 ID APRS 信息

A. Press the (MENU) key enter main Menu> Settings > Radio Settings > APRS> Delete All
B. Press the key to clear the information.

(5) Upload ID

Press the (MENU) key enter main Menu> Settings >Radio Settings >APRS > **Upload ID**.

(6) Upload Type

Press the (MENU) key enter main Menu> Settings >Radio Settings >APRS > **Upload Type**.

Note: ***The display status of the location information received by APRS.***

本机有定位到 GPS 界显

本机未定位到 GPS 界显

When receiving APRS information, if the device has a successful GPS positioning, it will automatically convert the distance between the transmitter and the device and the sender's position;
If the GPS of the device fails to locate successfully, the longitude and latitude information of the transmitter will be displayed.

6.6.1.18 Channel Display Mode

- **FREQ:** Displays programmed Frequency
- **CH Name:** Displays the channel name.

6.6.1.19 SMS Foramt

This parameter is used to set the data transmission method for the services such as Message, Quick Text.

- **H-SMS:** Allows data service transmission mode compatible with Hytera DMR radio.
- **M-SMS:** Allows data service transmission mode compatible with Motorola DMR radio.

6.6.1.20 Sub Ch Mode

- **On:** Turns on the sub channel, and the radio will display both channel.
- **Off:** Turns off the sub channel, and the radio will display the main channel only.

6.6.1.21 SK1/SK2/P1/P2 Key Different functions

This part allows users to assign your desired features as shortcut to some keys of the radio. **(Refer to page 22 & 24)**
The programmable buttons vary with different radios.
Every key corresponds to two kinds of operations: **Long press or Short press**.

6.6.1.22 Power Save

Turn on the function to extend the battery life.

- **None**, No power save.
- **Save 1:1**, work 30ms, dormant 30ms.
- **Save 2:1**, work 60ms, dormant 30ms.
- **Save 4:1**, work 120ms, dormant 30ms.

When turn on the power save, it may not receive the message in time.

■*Other Functions of Analog*■

A6.6.1.5 Analog Squelch Level

This option can limit background noises by adjusting the squelch level when the radio is receiving signals.

- **Normal:** Normal squelch level is helpful to receive weak signals.
- **Tight:** Tight squelch level can filter weak signals and allows only strong signals to be received.

Note: This function is only available in analog mode or analog channel.

A6.6.1.15 Freq Step

2.5K，5K，6.25K，10K，12.5K，20K，25K，50K，100K, total of 9 frequency steps.

Note: The step frequency menu is only displayed in VFO mode, and the channel mode automatically shields this menu.

6.6.2 Channel Settings

Channel Settings menu path: Press the key go to main Menu -> Settings -> Chan Set.
The channel set menu will change accordingly to the channel type. When the channel type is digital, it will automatical hide the analog menus.

■Digital channel parameter configuration steps

6.6.2.1 Receive Frequency

This option allows users to set a frequency for the current channel to receive signals. This value applies to the current channel.
(1) Press the (MENU) key enter main Menu> Settings >Chan Set> Rx Frequency.
(2) Press the key to enter the receive frequency editing, and press the key to delete it bit by bit.
(3) Input the RX frequency by keypad; Press key to save the setting and return to the previous menu.
NOTE: This parameter must be set within the Frequency Range.

6.6.2.2 Transmit Frequency

This option allows users to set a frequency (in MHz) on which a signal is transmitted for the current channel. This value applies to current channel.
(1) Press the (MENU) key enter main Menu> Settings > Chan Set > Tx Frequency.
(2) Press the key to enter the Transmit frequency editing, and press the key to delete it bit by bit.
(3) Input the TX frequency by keypad; Press key to save the setting and return to the previous menu.
NOTE: This parameter must be set within the Frequency Range.

Just because you can program in a channel does not mean you're automatically authorized to use that frequency. Transmitting on frequencies you're not authorized to operate on is illegal, and in most jurisdictions a

serious offence. If you get caught transmitting without a license you can and will get fined, and in worst case sent to jail. However, it is legal in most jurisdictions to listen. Contact your local regulatory body for further information on what laws, rules and regulations apply to your area.

6.6.2.3 Transmit Contact

Configure a frequently used contact for the current channel, and making a call to this contact when you press **[PTT]** key.
(1) Press the (MENU) key enter main Menu> Settings > Chan Set > Tx Contact.
(2) Press the π/θ key to select a contact in the contact list.
• None: It is forbidden to use **PTT** key to initiate a call on this channel in the standby state.
• The contact can be a **Private call, Group call, and All call**. Default: Contact 1

6.6.2.4 Color Code

Color code is used to identify a system. Users who wish to communicate with each other are assigned with the same color code. A radio ignores the channel activity which does not match the preset color code in this field, as it is assuming the activity belongs to other system. In a case where there are multiple systems (with different color codes set between the multiple digital channels), the user can turn on the Scan operation, that allows the radio to listen to activities across multiple systems.
• Range 0～15, Step 1。

6.6.2.5 Slot

TDMA scheme is applied to divide the 12.5 KHz channel into two consecutive slots. Set up Slot 1 or Slot 2 for the current channel.
•**Slot 1:** Slot 1 is used for transmitting and receiving in Repeater mode and for receiving signals from repeater in direct mode.
•**Slot 2:** Slot 2 is used for transmitting and receiving in Repeater mode and for receiving signals from repeater in direct mode.

6.6.2.6 Radio ID

In Digital channel, Allows edit and select an ID for the channel, each channel allows one ID.
(1) Press the (MENU) key enter main Menu > Settings >Chan Set > Radio ID.
(2) Input Radio ID and confirm.

NOTE: Allow users to set a unique ID to identify the radio. This ID is used by other calling radios when addressing the radio, for instance, when making a private call or sending a text message.

6.6.2.7 Radio Alias

(1) Press the (MENU) key enter main Menu > Settings >Chan Set > Radio Alias.
(2) Input Radio Alias and confirm.

The alias can be up to 7 Chinese characters or 15 letters. The radio alias will be viewed in the Device Information.

6.6.2.8 Channel Type

- **Digital Channel**: A digital channel can serve users with digital communication by applying DMR signaling. When it is set to a digital channel, the channel will display the D icon.
- **Analog Channel**: The following section allows for the configuration of the analog channels within the code plug. When it is set to a analog channel, the channel will display the A icon.

6.6.2.9 Double Slot Mode

Double Slot mode is applied to DMR digital radios. In this mode, one frequency supports calls in two slots synchronously. As for group calls in this mode, the members in the same group call must use the same slot, in order to avoid interfering communications in the other slot.

• **On:** The 卐 icon is displayed. And the radio in the same group must use the same Time Slot (Time Slot 1 or Time Slot 2) to talk.
• **Off:** Cancel the direct dual time slot function.

6.6.2.10 Channel Name

Allow users to set a unique name for each channel. This function is only valid in channel mode. Depending on the characters entered (can be a combination of numbers, symbols, and English or Chinese characters). The maximum length the radio can display varies.

6.6.2.11 RX Group List

It will allow edit the RX Group List and assign a new RX Group List to the channel.
• **Add list:** Use the numeric keyboard to name the added RX Group List, which can be letters, numbers, text, etc. After editing the name, press the — key to confirm and save and return to the previous menu.
• **Edit/View:** Use the π/θ keys to select a RX Group List, enter the "Edit/View" option, select Add Member, and add the Group Call Contact to the current RX Group List.
• **Remove Group:** Remove a Group Call Contact from the current RX Group List.
• **Apply:** Use the π/θ key to select a RX Group List, press the — key to confirm the application list and return to the previous menu.

6.6.2.12 New Chan

It will allow to create a new channel, you can set the channel type (analog or digital), name the channel, set the receiving frequency and transmitting frequency.
(1) Select "New Chan", then select Channel Type and confirm.
(2) Input channel name and confirm.
(3) Input the RX frequency by keypad, click the — key to save.

(4) Input the TX frequency by keypad, click the key to save.
The new channel will be saved to the channel pool.

■Analog channels setting steps

When the channel type is analog mode, it will automatically hide the digital menu. The menus listed below are only applicable to analog channels.

A6.2.3 CTC/DCS

(1) **Tx CTC/DCS**

This option defines the CTCSS/CDCSS value for decoding.

(2) **Rx CTC/DCS**

This option defines the CTCSS/CDCSS value for encoding.
NOTE: Please refer to "Appendix C" and "Appendix D" for CTCSS/DCS code

A6.2.9 Band Width

Choose Wide band (25.0 KHz) or Narrow band (12.5 KHz) for the analog channel.
NOTE: Only narrow band 12.5 KHz for digital channel.

6.6.3 Device Information

Users can view the radio's basic information using the menu. Show the Radio Name, Radio ID, Firmware version, CPS version etc.
Press the (MENU) key enter main Menu > Settings > Device Info. You can view the basic information of the terminal.
• Radio information: Radio Name, Radio ID.

• Software version: Firmware version, CPS version.

Note: The Radio Name and Radio ID can be edited in the channel parameter configuration.

Firmware Version: This option displays the firmware version programmed in the radio.

6.7. Record

The voice record is designed for security use purpose. Each call will be saved as a separated record ile with DMR ID and time details. The standard voice 10hours record allows in DMR mode only. The optional 500 hours voice record allow in both DMR or analog mode.

6.7.1 Turn On/ Off the Record

Method 1: Press the (MENU) key enter main Menu > Record > Record Switch, select on or off to turn on or off the record.

Method 2: Press the preset **[Record]** key to turn on the record function.

6.7.2 Record select

The record function of the radio can be directed to select Receive record, or Transmit record, or Receive and Transmit record, and the Record content can be selected according to needs.

The menu function operations are as follows:

(1) Press the (MENU) key enter main Menu > Record > Record Select,

(2) Press key to select the required record channel:

• If you select "RX Record", only incoming calls will be recorded.

• If you select "TX Record", only outgoing calls will be recorded.

• If you select "RX/TX Record ", all incoming and outgoing calls will be recorded.

6.7.3 Record List

Record List management includes Play, Delete, and View Details.

(1) Press the (MENU) key enter main Menu> Record>Record List.
(2) Press π/θ key to retrieve the record entry, and then press key to select.
• If you select "Play", the screen displays the record playback, and the current entry recording is played.
• If you select "Delete", the record of the current entry will be deleted.
• If you select "Detail", you can view detailed information such as Call ID, TX/RX, Date, Time, and Record duration.

6.7.4 Record Delete

(1) Press the (MENU) key enter main Menu> Record> Record Delete.
(2) Press the key and the screen displays "Are you sure?"
• Press the key to delete all record files.
• Press the key to cancel the deletion and return to the previous menu.

7. Accessibility

7.1. Password Service

This parameter allows you to set password to secure your radio. You can set the following: Contact your local dealer for help if you forget the password.

7.1.1 Read Password

This option allows users to edit the password for CPS Read Lock. A maximum of eight (8) digits can be configured for the password. Range: 00000000 to 99999999

7.1.2 Write Password

This parameter allows you to set the write password with a maximum of eight numbers. Range: 00000000 to 99999999.

7.1.3 Radio Password

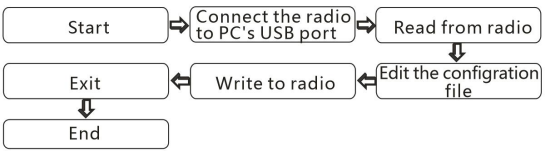
This option allows users to create a password required for powering up a radio. Range: 00000000 to 99999999.

7.2. Radio Reset

(1) Turn off the radio firstly.
(2) Then power it on while holding the [SK1] and [SK2] key below the PTT at the same time.
(3) The radio will start up with a note on the display – "***Are you sure restoring factory settings?***"
•Press key to exit the reset and turn on the power of the radio.
• Press key to continue the reset, the screen displays – ***initialize radio***.
Note: Only through CPS program, after checked the "Allow Reset" option, can you perform the operation of resetting the radio.

7.3. Programming Guide

You need to connect the radio to the computer via a program cable for program.



7.3.1Programming Flow

The program flow of the CPS is as follows:

When using a profile in your hard disk, use the CPS to import and edit it. Then write all data to the radio.

• During the radio reading, the indicator light is red and flashing.

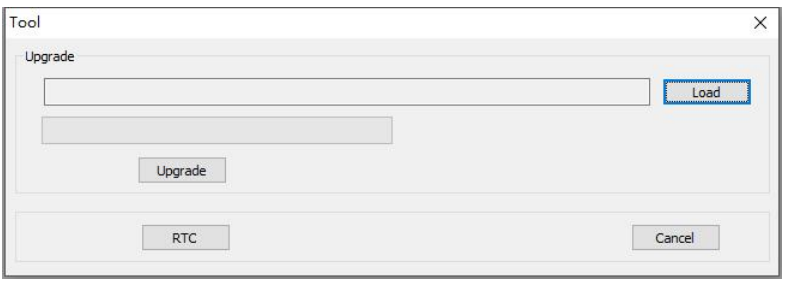
• During the radio writing, the indicator light is green and flashing.

Note: When programming this radio for the first time, it is recommended you first READ the radio with the software and then save this file for future reference as it contains the default programming and settings. In addition, after you READ this radio with software, first make your programming and frequency changes, then send this edited file back to your radio.

7.3.2 Firmware upgrade

NOTE: You can obtain it from the dealer or download the programming software and firmware (Codeplug) from the official website

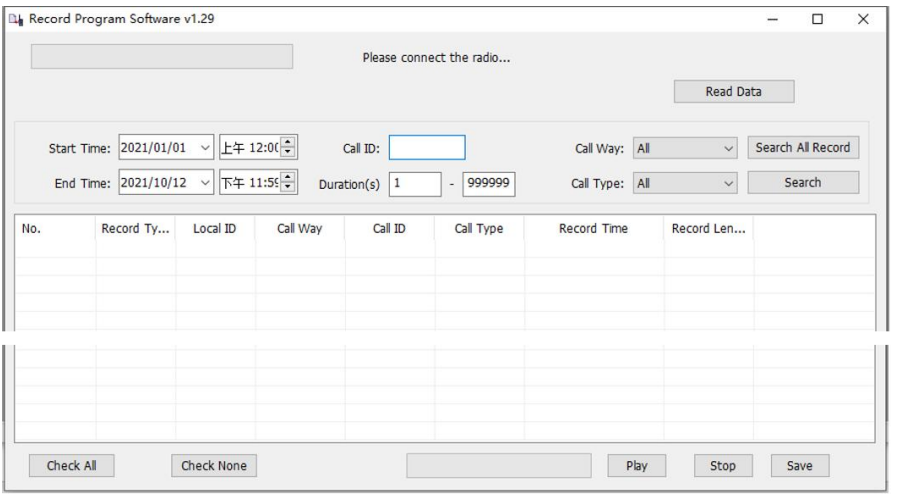
Go to the firmware download interface through CPS Software -> Tools -> Tools. Load the bin file, click "**Upgrade**", a dialog box prompts "**Please press and hold the [PTT+SK1] key to turn on the radio**", follow the dialog prompts and press the **[PTT]** and **[SK1]** keys to turn on the radio (the indicator light is green), Click **"Upgrade"**, the green light will flash until the upgrade is completed.



7.3.3 Using of CPS Tools

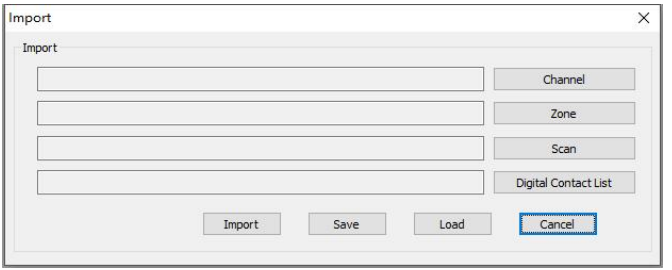
(1) Record management

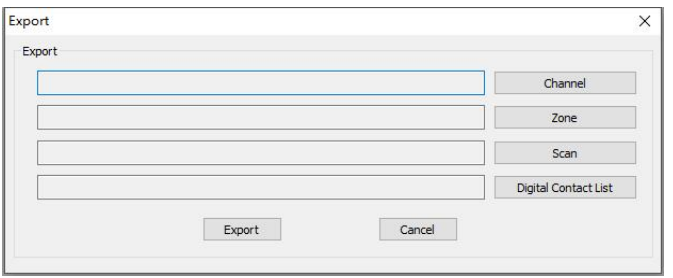
Go to the record management software through CPS software -> Tools -> Record. You can connect the radio, read out the records, view the detailed records of each record (Call ID, TX or/and RX, Call type, Record time, Record Duration, etc.) and play the Records or save them as WAV files for storage record.



(2) Import/Export configuration files

Enter the configuration file import or export through CPS software -> Tools -> Import/Export. You can import/export Channel, Zone, Scan List, Digital Contact Lists (.CSV), etc. separately.





(3) Tools

Through CPS software -> Tools -> Tools, you will be provided with self-service such as firmware upgrade, system time calibration RTC and so on.

7.3.4 Ranging function (optional function)

It is allowed to manually enter the ID of the target radio or select the target contact through the address book, and send the request command to obtain the distance. In the case of successful GPS positioning of the device, the distance and direction of the target radio or target contact can be obtained.

Method 1: Press the (MENU) key enter main Menu> Contact > Manual Dial > Enter ID > Ranging.

Method 2: Press the (MENU) key enter main Menu> Contact > Select a contact type of "Private call" > Ranging.

7.3.5 Multiple Radio ID's

The Dual-Band DMR Digital and Analog Portable Radio will allow multiple DMR Radio ID numbers to be used with the radio. This feature will allow one radio to be used for example as a Commercial Radio with its own DMR ID, and at the same time also be used as an Amateur radio with another DMR ID. In PC software, Digital/ Radio ID List, you can enter your Department Unit Number or Amateur Radio callsign.

7.3.6 Amateur DMR-MARC

For the best Amateur DMR experience obtain a subscriber ID from one of many available Amateur Radio sources. A U.S. Amateur can obtain a DMR ID From: https://www.radioid.net/cgi-bin/trbo-database/register.cgi
For DMR repeaters in your area please see: www.repeaterbook.com
World DMR repeater network map: https://www.repeaterbook.com/index.php/repeater-database
World DMR repeater network with verified Talkgroups by activity: https://brandmeister.network/?page=lh

7.3.7 Worldwide Amateur Contact Database

The Dual-Band DMR Digital and Analog Portable Radio contain a separate database memory for importing and displaying Amateur DMR individual IDs, call sign and user name in comma-delimited format (.csv) Please reference in the programming guide for import and export database operations detailed. User List Contact Database: https://ham-digital.org/status/

Appendix A. - Troubleshooting

Due to its sturdy design, your radios requires almost no maintenance. However, it is a sophisticated electronic instrument, so the following precautions should be followed:

If the antenna is damaged, do not transmit except in emergency situations. Antenna failure to transmit may cause further radio damage.

You are responsible for continuing to perform FCC technical compliance checks on the radio.

You should arrange regular performance checks with your dealer.

Phenomena	Solution
The radio cannot be switched on or no display after being switched on.	Battery pack may not be installed properly. Remove the battery pack and install it again.
	Battery power may be insufficient. Recharge or replace the battery pack.
The battery doesn't last very long after charging.	The battery is defective; please replace it with a new battery pack.
Cannot talk to or hear other members in your group.	1. Make sure the frequency and CTCSS are the same as other members.
	2. Make sure you are within range, and not too far away from your member.
	3. Make sure you are set in correct digital mode, and frequency.
	4. In digital mode, make sure set correct code and encrypt group is used in current channel.
	5. In digital mode, make sure set correct receiving contacts and receiving group is used.
Other voices from Non group members are heard on the channel.	Analog: Change the CTCSS/DCS Tone and make sure to change the tone on all radios in your group.
Digital channel can not Private call, Group call,	Check the Color Code, Time Slot, Tx Contacts, arranged to Rx Group List is correct

If the above solutions cannot fix your problems, or you may have some other queries, please contact your dealer for more technical support.

Appendix B. - Technical specifications

General Specifications	
Frequency Range	United State: VHF136.0-174.0MHz/UHF400.0-470.MHz Canada: VHF144.0-148.0MHz/UHF430.0-450.MHz Europe: VHF144.0-146.0MHz/UHF430.0-440.MHz Australia: VHF136.0-174.0MHz/UHF420.0-450.MHz India: VHF144.0-146.0MHz/UHF436.0-438.MHz
Memory Channel	Up to 4000
Digital Contacts	800+50000(.csv)
Frequency Stability	±1.0ppm
Operating Temperature	-10℃~+50℃
Operating Voltage	DC 7.4V
Dimension	135×61×34mm (no including the antenna)
Transmitter Specifications	
Output power	High:5W Low:1W
Output Consumption	Analog≤1.6A Digital≤1.0A
Consumption	≤0.18A
FM modulation	16K¢F3E@25KHz 141K¢F3E@20KHz 11K¢F3E@12.5KHz
4FSK digital modulation	12.5KHz for data:7K60FXD 12.5KHz for data and voice :7K60FXE
Modulation Distortion	≤5%
Signal-to-noise(wide/narrow)	≥45dB@25KHz ≥40dB@12.5KHz
Adjacent Channel power	≤-65dB ≤-60dB
Audio Response	+1~3dB
Antenna Port Spurious	9KHz-1GHz: ≤-36dBm 1GHz-12.75GHz: ≤-30dBm
Digital Protocol	ETSI-TS102 361-1,-2,-3
Vocoder type	AMBE+2 ™
Receiver Specifications	
Analog receive sensitivity	-122dBm (12dB SINAD)

Digital receive sensitivity	-120dBm (BER≤5%)
Audio power	≤1W
Audio distortion	<10%
Audio response	+1～-3dB
Signal imitation	≥70dB
Inter-mediation (Wide/ narrow)	≥62dB/≥58dB
Adjacent channel selectivity	≥65dB/≥60dB
Receive Current	≤380mA
FM noise	≥45dB@25KHz /≥40dB @12.5KHz

Disposal of your Electronic and Electric Equipment

Products with the symbol (crossed-out wheeled bin) cannot be disposed as household waste. Electronic and Electric Equipment should be recycled at a facility capable of handling these items and their waste by products. In EU countries, please contact your local equipment supplier representative or service center for information about the waste collection system in your country.

ATTENTION: conditions of use!

The band of frequencies on which this device operates is administrated by limitations and/or permissions for their usage. Consequently, in the EU Countries mentioned in the sheet, operators must consult the entrusted authorities. In particular, they must possess a license or a frequency assigned to them by their respective competent authority.

AT	BE	BG	CY	CZ	DE
DK	ES	EE	FI	FR	GB
GR	HR	HU	IE	IT	LT
LU	LV	MT	NL	PL	PT
RO	SK	SI	SE	CH	IS
LI	NO	-	-	-	-