

User Manual



VHF Transceiver

DX-8100

DX-8200

UHF Transceiver

DX-8400

Version #1 (2017-08-01)

XRadio

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1. DX-Series Features

DX-Series was developed with the user in mind to provide a compact and rugged design with features to fit multiple types of jobs such as military, firefighting, construction site, industrial site and large retailers.

It works in dual (analog / digital) mode, compatible with existing analog radio and efficient as well in digital mode with clear voice quality, volume, call distance and usage time.

As follows:

- 32 Channels in 16 Zones 32 (1zone = Max 32 Channels)
- 512 Channel Capacity
- 5/1 Watt RF Power Setting
- Text Messaging with inbox and outbox (within 40 letters), Max 10 sentences
- Encryption Mode (ARIA 128, 192, 256. LEA 128. 196. 256. AES128 256)
- TX Interrupt
- Lone Worker Mode
- Scan
- BCL / BCLO
- Time-Out Timer (TOT)
- Emergency / Siren
- Built in Flash Lamp
- Etiquette (Vibration)
- Voice recording and playback
- Mixed Channel Operation (Analog / Digital)
- GPS (Option)
- Five level VOX (Voice Operated Transmit)
- Five level S.Q (Analog)
- Remote Radio Stun / Kill / Revive
- Clear speaker volume of 1Watt
- UDC accessory connector for waterproof IP67
- 3Lines Mono LCD Display
- Aluminum metal Frame Body
- DC+7.4V Li-ion / 2,600mAH

2. Specification

2.1 DX Series

General

Frequency Range	DX-8100 : 136~174 MHz DX-8200 : 216~224 MHz DX-8400 : 400 ~470 MHz
Frequency Stability	±1.5ppm (-30 to +60°C)
Programmable Channels	16 Zones / 32 Channels
Channel Spacing	12.5KHz
Digital Vocoder	AMBE++
Dimensions	103mm(H) x 52mm(W) x 32mm(D)
Weight	280g
Power Source	DC +7.4V Li-ion 2,600mAH Battery
Current Drain (maximum)	Receive mode, rated audio out – 420 (Audio Max) Transmit mode – 1,200mA Standby mode – 110mA

Receiver

Sensitivity	0.25uV 12 dB SINAD
Squelch Sensitivity	0.22uV 10dB SINAD
Selectivity	65dB (12.5KHz)
Spurious and Harmonic Rejection	75dB
FM Hum and Noise	40dB (12.5KHz)
Audio Output Power	1 Watt across an 16-ohm load
Audio Distortion	Less than 3% at rated output
Audio Response	+1, -3 dB from 6dB per octave de-emphasis Characteristic from 300 ~ 3000Hz
Input Impedance	50 ohms

Transmitter

RF Power Output	5/1Watt
Spurious and Harmonic	70dB
FM Hum and Noise	40dB (12.5KHz)
Audio Distortion	3% maximum with 1KHz modulation
Audio Frequency Response	+1, -3dB from 6dB per octave pre-emphasis Characteristic from 300 ~ 3000Hz
Output Impedance	50ohms

3. DX Package Contents

* The components may be changed at the request of the buyer.



Radio Unit



Battery



One Slot Charger



Antenna



Belt Clip



Strap



User Manual

Figure 3-1) DX-Series Main Package Contents

XB-2600 : 2,600mAh Li-ion Battery Pack

XC-100D : One Slot Charger

XC-200D : Dual Slot Charger

423D-WS : 400~450MHz SMA Whip Antenna

460D-WS : 440~470MHz SMA Whip Antenna

3.1 Appearance of DX Series Radio

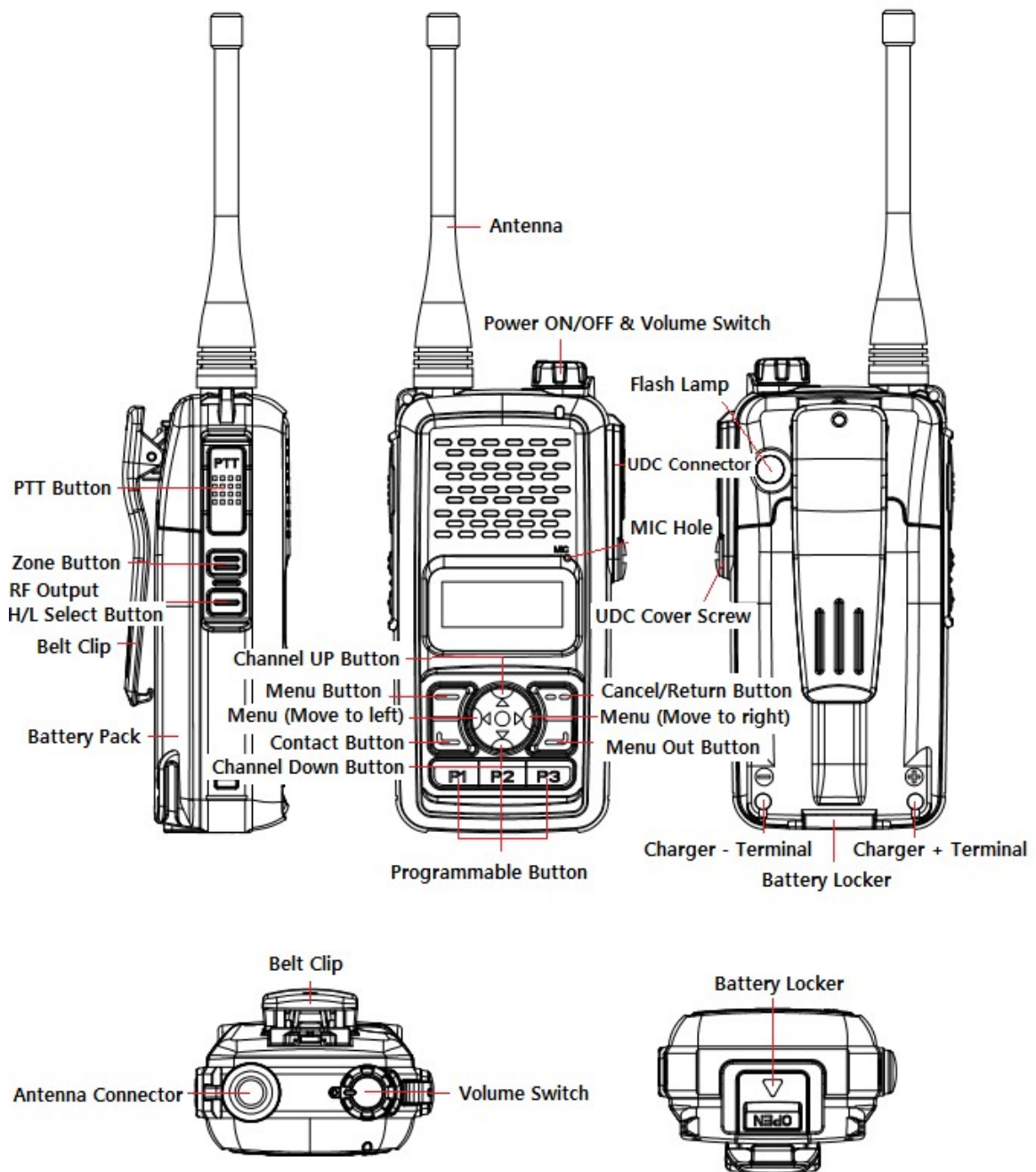


Figure 3-2) DX-Series Appearance of the Radio Unit

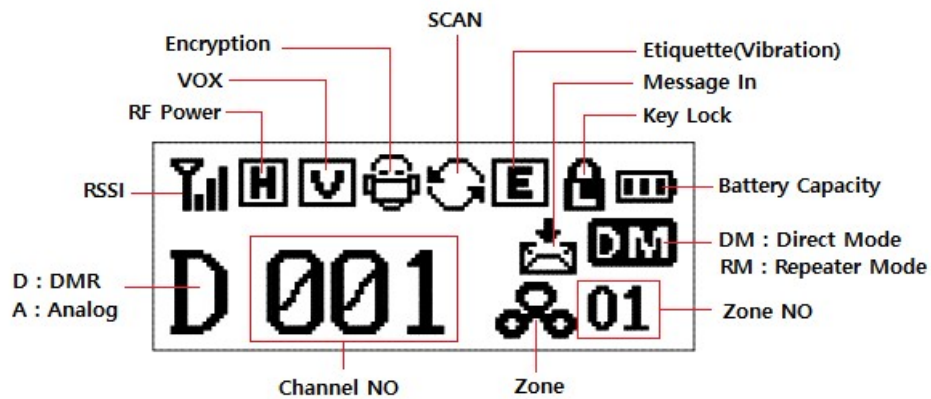


Figure 3-3) DX-Series Appearance of LCD

3.2 Button & LED Operations

Button & LED	Operation Description
Power ON/OFF	Turning the volume knob clockwise to power ON, volume up and turning the knob counterclockwise to power OFF, volume down.
Volume/Menu +/- Button	Press +/- button to control the call audio. + button will volume up and – will volume down. In Menu status, it moves through list functions to choose from.
Up/Down Button	You can change the setting for the set channel. 32 channels can be input per zone. You can move to other list functions in the progress of menu.
Zone Button	You can proceed to change the calling area set by the user in order.
Menu/OK Button	Button for entering into Menu mode. When entered into Menu mode, you can choose each list functions.
Cancel/Return Button	Press the button to return to previous item in menu. In the menu setting screen, it functions as cancel button.
P1, P2, P3 Button	Short press is Programmable Key. Long Press of button more than 2 seconds is as follows: - P1 is to disable the keypad lock function - P2 is to turn Flash ON / OFF - P3 is to turn Etiquette (Vibration) ON / OFF
Contact List Button	Button directly for Contact List. You can enter Private Contact, Private Call, Group Call or All Call.

4. Basic Operations

Please fully read the instruction manual before use.

This manual provides convenient information related to radio operation.

4.1 Antenna Installation and Removal

To attached the antenna connector, fasten the antenna clockwise.

To remove the antenna, rotate it counter-clockwise.

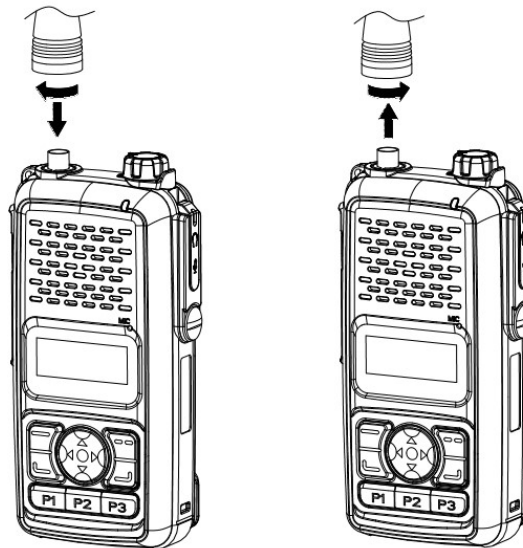


Figure 4-1) Antenna Installation and Removal



When installation of antenna, giving a strong pressure to the radio or pulling the antenna with a strong power from the radio can make a damage on the antenna connector, which may cause the radio to have a critical problem.

4.2 Battery Installation and Removal

Refer to the figure 4-2 and 4-3.

To remove the battery, push the locker and pull following the arrow direction.

To install the battery, slide up the battery towards the top of the radio as number 1 and push down as number 2 until battery latch is locked.

Push the locker and pull as shown in figure 4-2

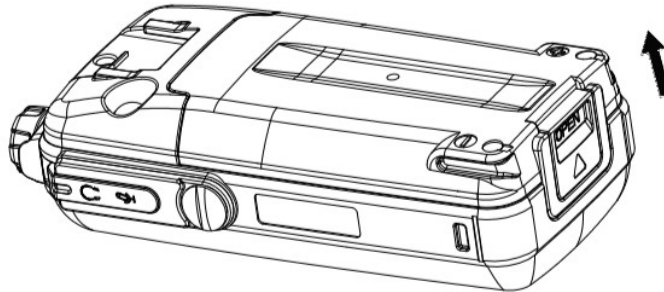


Figure 4-2) Battery Removal

Slide up the battery towards the top of the radio as number 1 and push down as number 2

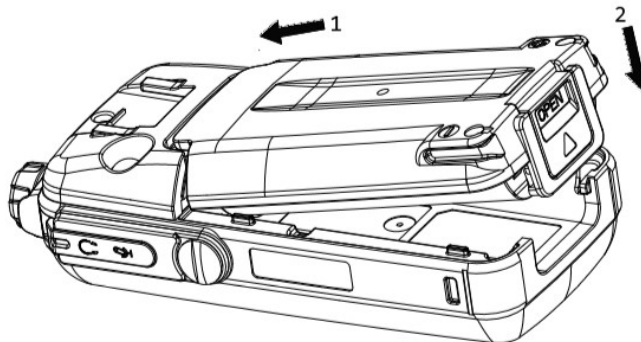


Figure 4-3) Battery Installation

4.3 Belt Clip Installation and Removal

Refer to figure 4-4.

To attach belt clip to the radio, align its rails with the grooves in radio and slide the belt clip onto the mounting rails until it latches into place.

To remove belt clip from the radio, push up on tab of belt clip with flat bladed screw driver and at the same time, slide the belt clip towards the top of Radio.

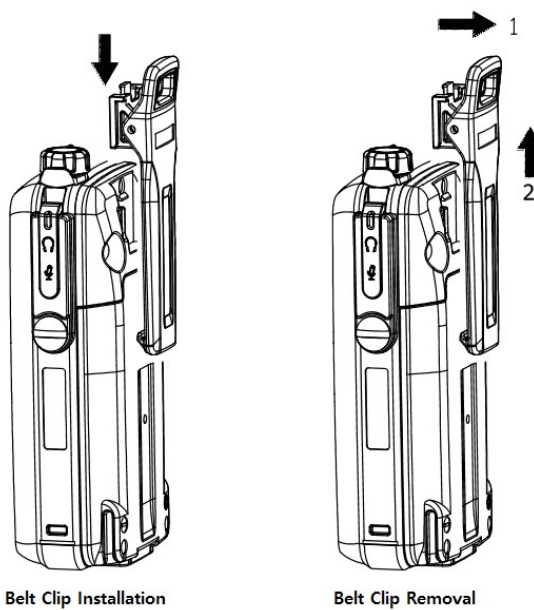


Figure 4-4) Belt Clip Installation and Removal

4.4 External Accessory Connector Jack

Connect the external accessory as shown in the picture.

Fix the main unit and the accessory by aligning them and tighten the screw.

To remove the accessory, loosen the fixed screw.

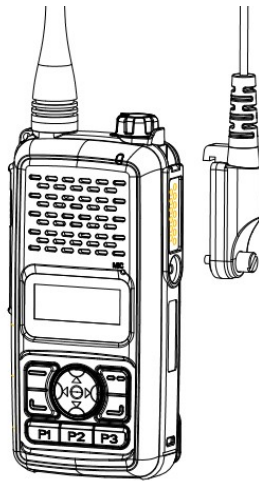


Figure 4-5) External Accessory Jack

4.5 Charging the Battery

RED lamp indicates the radio is on the charger (XC-200D) that the unit is starting to charge and the LED will illuminate GREEN when the charging is completed.

Charger (XC-200D) is dual to charge both the main unit and the battery pack.

When both of them are connected to the charger, the front radio with the battery will be charged first and the batter pack later.

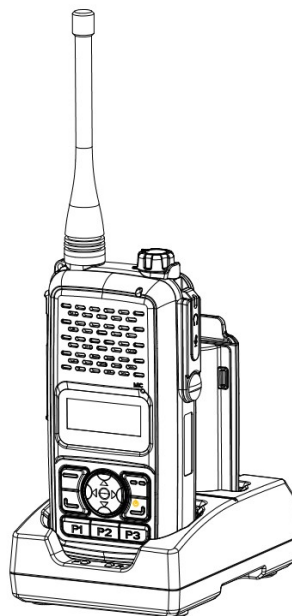


Figure 4-6) Charging the Battery

5. Operation of DX Series

DX series Button Operations are as follows in figure 5-1.



Figure 5-1) DX Series Button Description

5.1 Power ON / OFF, Volume Switch

Turning the volume switch knob clockwise to power ON and turning the knob counterclockwise to power OFF.

There will be a sound with a logo on LCD when turning ON the radio.

When turning the knob to counter-clockwise, you will hear good-bye and the radio will be turned OFF.

You can also control the Volume level with the knob. It volumes up when you turn it clockwise and volumes down when you turn it counter-clockwise.

5.2 PTT Button

The radio transmits messages when pressing PTT button. It receives messages when releasing the PTT button.

In order to have clear sound when transmitting, it is recommended to speak around 5~10cm away from the MIC.

5.3 ZONE Button

When pressing Zone button, zone registered in the program will be selected in order.

You can choose channel by using UP/DOWN button in selected zone.

5.4 Menu Button

After pressing the menu button, you will see the menu listed below as figure 5-2.

When pressing the left arrow button, it moves to the left.

When pressing the menu button one more time while in the menu, it moves to detailed menu section of the selected one.

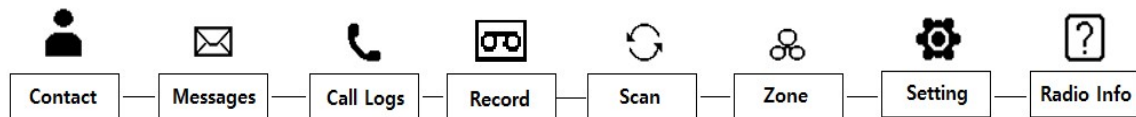


Figure 5-2) DX Series Menu

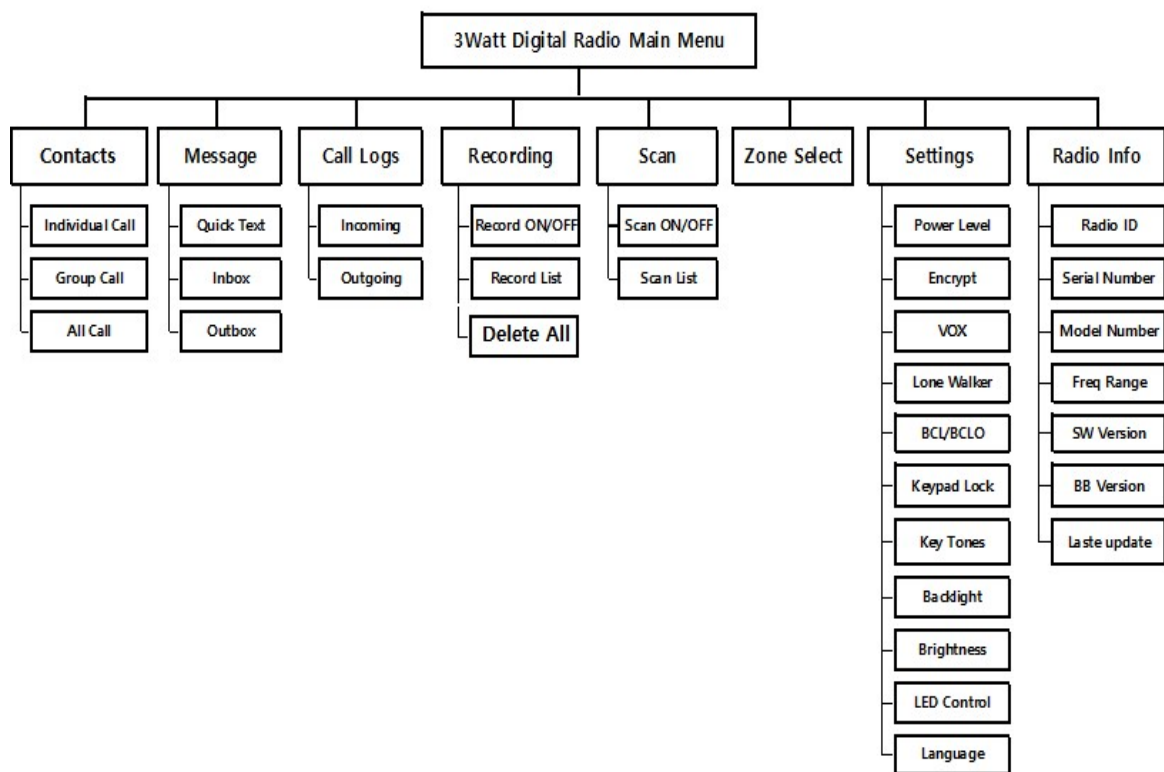


Figure 5-2) DX Series Menu Tree

5.5 Channel Menu UP / Down Button

Regularly UP / DOWN buttons are for the channel selection.

In the menu screen, it moves through different functions (UP&DOWN).

5.6 Contact Button

Press the button to enter the contact list programmed into the radio such as Private, Group and All Call.

5.7 P1, P2, P3 Programmable Button

Press of the buttons allow the enable and disable of programmed functions.

Operational short press and long press (Over 2 seconds) are available.

You can set the function with short Key in PC program.

However, Long Key is defined in the radio itself.

When Keypad Lock is ON, key Lock is set automatically in 10 seconds when there is no press of buttons.

P1 is to disable temporarily the keypad lock function and you need to press Long Key to unlock it.

It automatically locks again when you do not press the buttons in 10 seconds.

In order to unlock totally the keypad lock, go to the menu-settings and select OFF in the Keypad Lock menu.

P Button	Short Key	Long Key
P1	Programmable	Key Lock ON / OFF(Temporarily)
P2	Programmable	Flash Light ON / OFF
P3	Programmable	Vibration ON / OFF

5.8 UDC EAR / MIC Jack

UDC EAR/MIC Jack is used in the following cases:

- 1) When using external speaker MIC
- 2) When setting radios with CPS Program
- 3) When communicating with external terminals

5.9 LED Indication Status

This LED is a lamp indicating the current status of the Radio and please refer to the below contents.

- ① Normal TX: Red Lamp
- ② Normal RX: Green Lamp
- ③ Green lamp flickers when frequency matches but not the color code.
- ④ Low Battery: Red Lamp blinks with "beep" sound.

6. Charging the Battery

6.1 Safety Notes

1) DX-series receives power from high-performance Li-ion battery (XB-2600).

Battery is safe of high performance and highly reliable.

When using the standard charger, it allows you to fully use the battery's efficiency and life span.

	The charging of the enclosed radio on the other maker's charger will cause damage to the battery and also a trouble.
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2) Please charge the battery before using the radio for best performance and safety.

3) When you charge the battery that is installed in the radio, please turn off the radio first to charge the battery.

	The continuous rapid discharge (For example, when making a short circuit on the '+,-' terminals of battery by a metal substance) may make a fatal defect and the battery can be exploded as well as cause fire.
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6.2 The Time of Charging

low battery voltage may reduce communication coverage and also make the performance worse.

Please charge the battery in case of following:

- 1) When you think the performance of the radio has degraded.
- 2) When the red lamp on RX / TX LED blinks (every 0.5 seconds) during transmission or reception.
- 3) When the battery icon flickers.
- 4) When you hear the "beep" sound while the radio is in use.

6.3 How to Charge

1) Plug the adaptor of XC-200D charger in general power AC220V.

2) When charging the battery that is equipped with radio, please turn off the power of the radio and plug it in the charger.

- 3) Even if charging it completed (green lamp lights shown), please charge about 30 more minutes for a full charge.

Status	LED Indication	Status	LED Indication
Charging	Red LED lights	Error Detection	Red LED flickers
Complete Charging	Green LED lights	Keep Charging	Green LED Appears

7. DX-Series Operation

7.1 Menu Functions

To enter the menu lists, press  button to have access.

There are 8 main menus and you can use the radio more conveniently if you use it according to your purpose and environment.



Figure 7-1) DX Series Menu Lists

Note) If the menu is not operated for at least 25 seconds after launch, the radio will revert to standby mode.

7.1.1 Contact

Set the contact list by CPS program and press PTT button to call.

When you prefer to call another registered call, select from the list and press PTT button.

It is available to register / delete the contact list by CPS (Customer Programming Software).

You can find Individual, Group and All Call list by selecting the Contact menu.

- Icons below are shown in the contact list.
 - : Individual Call List (Individual Call , Send individual message)
 - : Group Call List (Group Call , Send group message)
 - : All Call List (Can use the terminals with the same channel and color code)

7.1.2 Messages

When you receive a message, the contents will be displayed on the LCD screen.

When you are in the menu and the message is sent by someone, it will appear as an icon.

There are Quick Text, Inbox and Outbox function as follows:

1) Quick Text

The preset messages are up to 10 in total by CPS Program.

Each message can be written up to 40 letters and be edited.

You can see the quick text message when selecting from the menu and select the message and press  button to see it.

When you press one more time  button, the message will be sent to the terminal.

2) Inbox

Stores up to 10 receives text messages; when the received messages exceed 10, the oldest message is cleared and the newest incoming message is registered.

When you choose messages stored in the list, you can view the received messages.

You can also delete the received messages by selecting all delete menu.

3) Outbox

Stores up to 10 outgoing text messages; when the outgoing messages exceed 10, the oldest message is cleared and the newest send message is registered.

When you choose messages stored in the list, you can view the sent messages.

You can also delete the sent messages by selecting all delete menu.

7.1.3 Call Logs

The function allows the viewing of incoming and outgoing calls from individuals only.

The Group and All call records are not saved. The contents are managed in the same manner as Inbox / Outbox of the messages.

1) Inbox

Call records in the inbox can be saved up to 10.

You can also see the caller ID.

Stores up to 10 receives calls; when the received ones exceed 10, the oldest call is cleared and the newest incoming call is registered.

You can also delete the received records by selecting all delete menu.

2) Outbox

Stores up to 10 receives calls; when the received ones exceed 10, the oldest call is cleared and the newest outgoing call is registered.

You can also see the caller ID.

You can delete the sent records by selecting all delete menu as well.

7.1.4 Record

This function is used to record the content of incoming and outgoing calls.

You can delete all when the recorded contents are unnecessary.

Up to 63 conversations / recordings can be stored with each recording limited to 2 minutes and 30 seconds.

Turn ON or OFF the setting in the menu when you need this function.

 주의	In the state that the encryption function is selected, only the call with the encryption mode can be heard in normal recording and call with no encryption mode cannot be heard.
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7.1.5 Scan

Channels set in the scan list can be scanned in order when the Scan function is ON.

When there is used channel while scanning, it stops at that channel and receives the contents.

When wanting the call while scanning, use the CPS Program.

1) Scan ON/OFF

This function provides the ability to turn scan ON/OFF and review the scan list as programmed into the radio via the Program.

2) Scan List

You can set the scan list via CPS Program.

7.1.6 ZONE

Up to 16 zones (with up to 32 channels per zone) can be programmed into the radio via CPS program.

7.1.7 Setting

This function allows the changes to the settings of the radio status.

There are Power level, Encryption, Voice Operated Transmit (VOX), Lone worker, BCL/BCLO, Keypad lock, Tones, LCD Backlight, LCD Contrast/Brightness, LED control, Language etc.

1) TX Output

This function sets the power transmitting level at high or low.

2) Voice Encryption

This is a feature to encrypt the incoming and outgoing voice.

Voice Encryption function can only be performed from digital channel to each channel.

Voice Encryption code is set via CPS Program.

Encryption code can be set from 0 to 65535.

3) VOX

VOX function allows transmitting voice without pressing the PTT button.

VOX sensitivity level is adjusted from 1 to 5 and can be set by users via CPS program.

4) Lone Worker

This function can inform others about your safety within the time set in the menu.

Setting time is from 1 minute to 100 minutes

5) BCL / BCLO

This function prevents interference when the channel is busy and limits the TX.

BCL : If the current channel is busy, the transmission is prohibited.

BCLO : The transmission is done regardless of the busy status of the channel.

6) Keypad Lock

This function locks the keypad to prohibit the accidental press of keys and buttons by the users.

When Keypad lock is ON, all keys and buttons are locked except the PTT button, the emergency button and power ON/OFF.

Press the **PTT** key for 2 seconds to temporarily unlock the keypad for 25 seconds. Then, the keypad will be locked again.

To unlock the keypad, go to the setting and select Keypad Lock and changed the status to OFF.

7) Tones

This function enables or disables the tones associated with key and button presses.

Only ON/OFF setting is allowed with the radio itself.

The details can be set through CPS program.

8) LCD Backlight

This function allows the backlight of the LCD to be turned ON/OFF.

9) LCD (Contrast/Brightness)

This function is to adjust the contrast/brightness of from 1 to 7.

10) LED Control

This function is to set the enable or disable the radio LED status.

You can set it with CPS program the details.

11) Language

This function is to select the language by the user.

7.1.8 Radio Info

This shows all the info of the radio.

8. Safe Operation

8.1 Precautions

	Do not remove the antenna from the radio or do not transform the antenna or do not make any changes on the antenna. The strong electronic wave to be emitted from the radio can have an effect on the performance of the radio and can cause the radio to have a defect.
	Do not use accessories (such as rechargeable battery, adaptor, external speaker microphone and earphone etc.) from the other makers, which can cause defect on battery and malfunction or a defect on the radio.
	Do not disassemble or reorganize the radio. The disassembly or reorganization will cause a defect or malfunction on the radio. It will be impossible to repair afterwards. There will also be a punishment made by the Radio Waves Act.
	Do not use other frequency except for the permitted frequency in order not to be punished by the Radio Waves Act.
	• Do not give an excessive shock to the radio. • Do not place the radio where the direct sunlight and/or the high temperature occurs.. • If the radio is placed for a long time in a car in summer, the hot temperature in the car may cause explosion of battery. • Do not make a damage to the battery by a sharp substance and/or an excessive shock.

8.2 Influences on the Operations of Radio or Other Equipment

The radio emits a strong electronic wave, which may have an effect on the operation of other equipment and also can be influenced by the other devices.

 경 고	Please turn off the radio before boarding on the airplane. When using the radio in the airplane, please follow the rules or the instructions of the flight attendants.
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 경 고	In case of the area that medical equipment are being used, please use the radio after discussion with the equipment producer or the related doctor.
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 주 의	Please do not use the radio at the place where computer or other electric/electronic devices are being used. The strong electronic wave from the radio can have an effect on the equipment.
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9. Safety Notes

Please make sure to read the followings above for safe and effective use of the radio.

 경 고	• Please keep the radio away at least 1 inch from the body. • If the outside surface of antenna gets stripped out, it can make a burn on the skin. • If you contact a conductive metal to battery terminal, a heat can be made and it may cause fire, explosion and burn. Especially, please be careful when putting the battery in a pocket or a bag. • When using an earphone, please do not listen to the sound at a high level. The high sound may have a bad effect on your ear. • After setting the volume of the radio at a low level, please adjust the volume step by step to the level you want. A sudden high sound may bring a bad damage to the ear or the heart. • Please do not remove, replace, charge or discharge the battery at a dangerous area since it may cause explosion or fire by an electrical spark. • At the area where an electromagnetic force can be made, please make sure to turn off the power of the radio.
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Warranty Statement

Thank you for purchasing DX-8000 Series.

1. This product has passed strict quality control and testing process by YeonHwa M Tech.
2. Warranty is one year from the day of release.
 - When there is malfunction of the product under normal operating conditions during the warranty period, your authorized dealer and the service center will repair it free of charge.
3. Service fees will be charged for the following cases:
 - When performance failed, malfunction or damaged after the warranty period.
 - When the product is damaged due to user's mishandling or improper operation.
 - When the product is damaged due to fire, pollution, earthquakes and any other natural or unnatural conditions, accidents etc.
 - Malfunction by not keeping the notices written in the user manual.
 - Malfunction by not using the appointed adaptor.
 - When the product is damaged due to user's modification, attempts of repairing rather than the appointed service center.
4. Product Check List

Model Name		DX-8000 Series
Serial No.		
Purchase Date		
Purchaser	Name	
	Address	

※ Please fill out this check list when purchasing the product.

YeonHwa M Tech Co., Ltd.

36, Jeonparo 44beongil, Manan-gu, Anyang-si, Gyeonggi-do, Korea 14086

TEL: 82-31-444-7270

FAX: 82-31-444-7271

1. Warning

This device complies with Part 90 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. changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 90 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.

NOTE: This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

RF Exposure Statement

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance of 0mm the radiator your body.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure Information:

The SAR limit of USA (FCC) is 1.6W/kg averaged over one gram of tissue. Device Types (FCC ID: VSODX-8400) has also been tested against this SAR limit.

The highest SAR value reported under this standard during product certification for use when properly worn on the Face-held is 0.868W/kg and for body-worn is 2.76W/kg. Simultaneous RF exposure is 3.628W/Kg.

This device was tested for typical body - worn operations with the back of the handset kept 0mm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that attain a 5mm separation distance between the user's body and the back of the handset.

The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly.

The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

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