## To Customer

Thank you for purchasing our handheld DMR digital transceiver, This model is novel design, stable performance and we want to developing this model were portable equipment, easy to operate and with a variety of sophisticated functions, so we are using the most advanced technology. we deeply confident that its quality and functionality would make you feel satisfied!

# INSTRUCTIONS BEFORE USE

- Do not use a transceiver with damaged antenna, because it might cause slight burns once skin contact carelessly.
- Do not use transceiver or battery charging, when they are under explosive environment (such as gas,dust and smoke etc.).
- When parking at gas station,or being refueling, please turn off the transceiver.
- There are not any reason to modify or adjust the transceiver.
- Do not keep your transceiver by prolonged direct sunlight, as well can not place it near heater machine .
- Do not place the transceiver on where are filled with most dust, damp and water splashing, as well as do not put it on the not unstable surface.
- Repair work only do by the professional technician.
- If it appears that the transceiver diffuses peculiar smell or smoke, please turn off it immediately, and take down battery pack from radio body, then contact with supplier.

# SAFETY

It is very important for the user to know and recognize the general danger of using the radio.

# CONTENTS

# MAIN FEATURES

## General Functions

- SMS Function
- Color LCD Display
- VOX
- Private Call, Group Call And Single call
- Emergency Mode
- Power ON Password
- Programmable Side Key
- Battery Capacity Indicator
- Hi/Low Power Selection
- Chinese/English Surface Selection
- Channel/Priority Channel Scanning
- 64 Channel Zones, 1000 Channels
- Remote kill/stun/activate
- Wide/Narrow Bandwidth
- DTMF

## Functions in Digital Mode

- Encryption Function
- Call Record
- Message Function
- Remote Monitor
- Radio Detection
- Radio Activating
- Radio Remote Kill
- One Key Connected Function
- Single Call, Group Call, All Call
- Contact list function, savable 1000pcs contact
- Complying with digital protocol ETSI TS 102, 361-1, -2, -3
- Compatible with MOTOTBRO
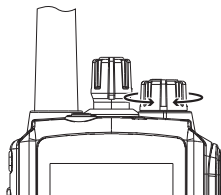
# UNPACKING

Carefully unpack the radio and its accessories to identify them as illustrated below. If you find any missing or damaged parts, please contact your dealer immediately.

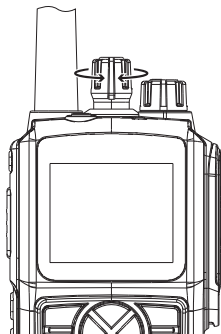| Items | QTY. |
|---|---|
| Radio | 1 |
| Antenna | 1 |
| Battery Pack | 1 |
| Charger Cup | 1 |
| Power Adaptor | 1 |
| Belt Clip | 1 |
| Belt Clip Screws | 2 |
| User Manual | 1 |
| Hand Strap | 1 |

# BASIC OPERATION

## Power ON/OFF/Volume

Turn the Power/Volume Knob (Fig.1) clockwise to switch ON the radio, a beep will be heard. Turn the knob clockwise/anti-clockwise to adjust the volume. Turning the knob fully anti-clockwise will switch off the radio.
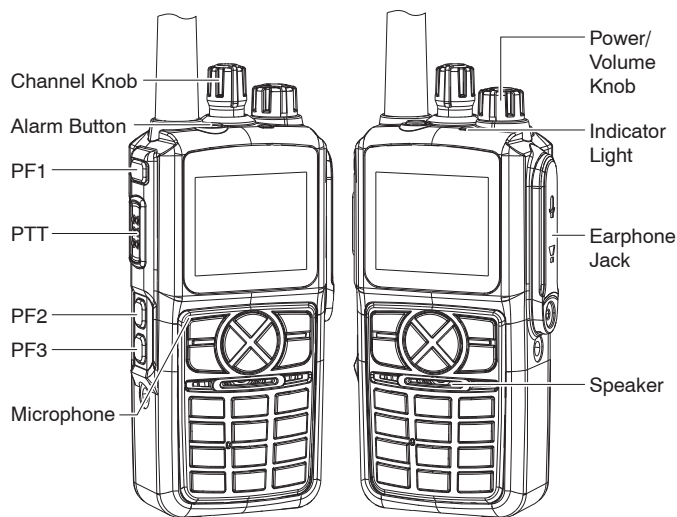
## Select a Channel

Turn the channel knob to select the channel number. The radio has 1000pcs channels and 64 pcs channel zones (Each zone can set 16 pcs channels). Each channel can set Analog mode or Digital mode. You can select the channel zones from LCD menu. When you switch to Analog mode, some functions can't be used; the icon of referring to digital function will be grey.

## Transmit/Receive

Hold the radio about 2.5cm to 5cm from your mouth. It is important that the antenna is 2.5cm away from your face. Press the PTT button, the red LED will be illuminated and whilst keeping it pressed, speak into the microphone in your normal voice. And release the PTT key to receive, the green LED will illuminate.

# OVERVIEW



Channel Knob
Alarm Button
PF1
PTT
PF2
PF3
Microphone

Power/Volume Knob
Indicator Light
Earphone Jack
Speaker

**NOTE:** Users need to understand well the functions which definite in Keypad/Side Buttons/LCD Display Icon/LED Indicator, then can maximize the capabilities of this DMR radio.

## Keypad

Users can check the menu function by pressing **[▲▼◄►]**, after choose one function, press **left [–]** key to confirm or press **right [–]** key back to last menu.

Users can use the 3×4 alphabet and digital keypad to view the function, also can set name, ID and message. Some character needs to press more times, you can check as below tab.

| 1 ., ? | . , ? ! @ & % - : * # 1 |
|---|---|
| 2 ABC | A B C 2 |
| 3 DEF | D E F 3 |
| 4 GHI | G H I 4 |
| 5 JKL | J K L 5 |
| 6 MNO | M N O 6 |
| 7 PQRS | P Q R S 7 |
| 8 TUV | T U V 8 |
| 9 WXYZ | W X Y Z 9 |
| 0 ␣ | SPACE 0 |

## Side Button PF1/PF2/PF3

These side buttons PF1/PF2/PF3 can be allocated for certain functionalities by software. The functions features that can be programmed are listed below, you can active/deactivate the function by short press or long press once your definite the key in advanced.

**Short Press –** Pressing and releasing rapidly.
**Long Press –** Pressing and holding for the programmed duration.
**Side Button PF1/PF2/PF3 –** Programmed Side Buttons Functions (PF Button).

| No. | Feature | No. | Feature |
|---|---|---|---|
| 1 | Radio Enable | 10 | VOX |
| 2 | Radio Check | 11 | One Access 1 |
| 3 | Radio Disable | 12 | One Access 2 |

| 4 | High/Low Power | 13 | One Access 3 |
|---|---|---|---|
| 5 | Monitor | 14 | One Access 4 |
| 6 | Emergency Mode ON | 15 | One Access 5 |
| 7 | Emergency Mode OFF | 16 | Bit Error Rate |
| 8 | Zone Selection | 17 | Repeater/Talk Around |
| 9 | Scan ON/OFF | | |

## LCD Display Icon

**Received Signal Strength Indicator**
The number of bars displayed represents the radio signal strength. Four bars indicate the strongest signal. This icon is only displayed while receiving.
**Power Level**
Radio is set at Low power or High power.
**Battery**
The number of bars (0-4) shown indicates the charge remaining in the battery. Blinks show battery is low.
**Monitor**
Selected channel is being monitored.
**Emergency**
Radio is in Emergency mode.
**Scan**
Scan feature is enabled.
**Unread Message**
Selected channel is being monitored.
**Full Message**
The test message has already full.
**Date**
Show the date.
**Time**
Show the time.

## LED Indicator

The LED indicator shows operation status of your radio.
**Red:** Radio is in transmitting signal, sending test message, sending a privacy enabled call or data.
**Green:** Radio is Powered on or receiving signal, receiving test message, receiving a privacy - enabled call or data.
**Blinking Red:** Radio is in scan mode.

## FUNCTIONS OPERATION

## Making and Receiving Calls

◇ **PTT Key**

Each channel can be set as Analog or Digital mode. Press PTT to transmit, release PTT to receive.

◇ **Select a Zone**

Zone is a channel group, the radio supports max. 64 zones. Each zone support 16 channels. Press **left [–]** key to Access **[▲▼◀▶]** menu and select the 'Zone', then press **right [–]** key to confirm. Turn the channel knob to select to channel under this zone.

◇ **Receive and Reply a Group Call**

To receive a call made to a group of users, your radio must be configured as part of that group.

◇ **Receive and Respond to a Private Call**

A Private Call is a call from an individual radio to another individual radio.

◇ **Receive an All Call**

An All Call is a call from an individual radio to every radio on the channel. It is used to make important announcements requiring the user's full attention.

## Making a Radio Call

After selecting your channel, you can select a subscriber alias or ID, or group alias or ID by using:
• The Channel Selector Knob
• A programmed One Touch Access button
• The Contacts list

- Manually dial(by contact lists)
- Manually dial (by contact lists)

## Making a Call with the Channel Selector Knob

### ◇ Making a Group Call

To make a call to a group of users, your radio must be configured as part of that group.

### ◇ Making an All Call

This feature allows you to transmit to all users on the channel. Your radio must be programmed to allow you to use this feature.

### ◇ Making a Group or Private Call with the One Touch Access Button

The One Touch Access feature allows you to make a Group or Private Call to a predefined alias or ID easily. This feature can be assigned to a short or long programmable button press, or to a long numeric button press. You can ONLY have one alias or ID assigned to a One Touch Access button. Your radio can have multiple One Touch Access buttons programmed.

## Talk Around

You can continue to communicate when your repeater is not operating, or when your radio is out of the repeater's range but within talking range of other radios. This is called "Talk Around".

## Monitoring Features

Use the Monitor feature to continuously monitor a selected channel for activity.

## Radio Check

If enabled, this feature allows you to determine if another radio is active in a system without disturbing the user of that radio. No audible or visual notification is shown on the target radio.
This feature is only applicable for subscriber aliases or IDs.

## Scan Lists

Scan lists are created and assigned to individual channels/groups. Your radio scans for voice activity by cycling through the channel/group sequence specified in the scan list for the current channel/group. Your radio can support up to 250 scan lists, with a maximum of 16 members in a list. Each scan list supports a mixture of both analog and digital entries.
You can add, delete or prioritize channels by editing a scan list. You can attach a new scan list to your radio via Front Panel Programming.
- View an Entry in the Scan List
- Editing the Scan List

## Scan

When you start a scan, your radio cycles through the programmed scan list for the current channel looking for voice activity. The LED blinks yellow and the scan icon appears on the status bar. During a dual mode scan, if you are on a digital channel, and your radio locks onto an analog channel, it automatically switches from digital mode to analog mode for the duration of the call. This is also true for the reverse.
There are two ways of initiating scan:
- Main Channel Scan (Manual)
- Auto Scan (Automatic)

## Starting and Stopping Scan

Responding to a Transmission During a Scan, your radio stops on a channel/group where activity is detected. The radio stays on that channel for a programmed time period known as "hang time".

## Contacts Settings

Contacts provides "add" capabilities on your radio. Each entry corresponds to an alias or ID that you use to initiate a call. Each entry, depending on context, associates with one of five types of calls: Group Call, Private Call, All Call.

## Call Indicator Settings

Users can visit the menu to turn on/off the call/keypad tone. By pressing **left [–]** key to visit the menu and press **[▲▼◄►]** to confirm and visit next submenu, then by pressing **[▲▼◄►]** again to choose the functions you need.

## Emergency Operation

An Emergency Alarm is used to indicate a critical situation. You are able to initiate an Emergency at any time on any screen display even when there is activity on the current channel. This radio supports 3 types of alarm:

**Conventional –** Radio transmits an alarm signal and shows audio and/or visual indicators.

**Forbid –** Radio transmits an alarm signal without any audio or visual indicators. Radio receives calls without any sound through the radio's speaker, until you press the PTT button to initiate the call.

**Silent with Voice –** Radio transmits an alarm signal without any audio or visual indicators, but allow incoming calls to sound through the radio's speaker. Only ONE of the Emergency Alarms above can be assigned to the programmed Emergency button.

## Text Message Features

The radio supports the text at max.144 characters, by pressing **[▲▼◄►]** to choose the function you want, and press **left [–]** key to confirm and visit the next submenu. then by pressing **[▲▼◄►]** again to choose the functions you need.

**Sending a Quick Text Message**
- Sending a Quick Text Message with the One Touch Access Button
- Resending a Text Message
- Editing a Text Message
- Managing Sent Text Message
- View a Sent Text Message
- Sending a Sent Text Message
- Deleting All Sent Text Messages from Sent Items
- Receiving a Text Message
- Reading a Text Message
- Managing Received Text Messages
- Deleting a Text Message from the Inbox
- Deleting All Text Messages from the Inbox

## Security

You can enable or disable any radio in the system. For example, you might want to disable a stolen radio, to prevent the thief from using it, and enable that radio, when it is recovered. Users can choose the function by MENU operation, to active "Radio Disable" or "Radio Enable".

## Radio Settings

Under this menu, users can set the "Password Lock Features", "Turning the Radio Tones/Alerts On or Off", "Set Squelch Level", "Set Power Level", "Turn ON/OFF Display Backlight", "Turn the Introduction Screen On or Off", "Turn ON/OFF the VOX", "Language", "Turn ON/OFF VOX", "Changing the Password", "Accessing General Radio Information", "Checking the Radio Alias and ID", "Checking the Firmware Version and Codeplug Version".

# SPECIFICATION

| General | |
|---|---|
| Frequency Range | 136-174/400-480MHz |
| Channel Capacity | 1000 |
| Channel Spacing | Analog: 25/12.5kHz; Digital: 12.5kHz |
| Working Voltage | 7.4V Rated |
| Frequency Stability | ±1.5 ppm |
| Antenna Impedance | 50Ω |
| Dimension (H × W × D) | 120 × 65 × 35mm |
| Weight | About 260g<br>(with battery, antenna, belt clip) |
| **Transmitter** | |
| Power Output | 4W/5W/1W |
| FM Modulation | 11KΦF3E @ 12.5 kHz<br>16KΦF3E @ 25 kHz |
| 4FSK Digital Modulation | 12.5kHz Data only: 7K6φFXD<br>12.5kHz Data & Voice: 7K6φFXW |
| Spurious Emission | -36dBm<1GHz; -30dBm>1GHz |
| Modulation Limiting | ±2.5kHz @ 12.5 kHz<br>±5.0kHz @ 25 kHz |
| FM Hum & Noise | 40dB @ 12.5 kHz; 45dB @ 25 kHz |
| Adjacent Channel Power | 60dB @ 12.5 kHz<br>70dB @ 20/25 kHz |
| Audio Response | +1~-3dB |
| Audio Distortion | ≤5% |

| Receiver | |
|---|---|
| Sensitivity (Analog) | 0.2μV (12dB SINAD) |
| Sensitivity (Digital) | 0.3μV /BER5% |
| Selectivity TIA603 ETSI | 60dB @ 12.5kHz / 70dB @ 25kHz<br>60dB @ 12.5kHz / 70dB @ 25kHz |
| Intermodulation TIA603 ETSI | 65dB @ 12.5/20/25 kHz |
| Spurious Response Rejection TIA603 ETSI | 70dB @ 12.5/20/25 kHz |
| SNR | 40dB @ 12.5 kHz; 45dB @ 25 kHz |
| Conducted Spurious Emission | -57 dBm |
| Audio Power Output | 1W |
| Audio Distortion | ≤5% |
| Audio Response | +1~-3dB |
| **Environmental Specifications** | |
| Operating Temperature Range | -30°C ~ +60°C |
| Storage Temperature Range | -40°C ~ +85°C |