

User Manual

Welcome to use our Amateur radio

1. Precautions

Please observe the following precautions when using this product to avoid fire, personal injury, damage to equipment or other accidents:

- ① Do not use the equipment in inflammable and explosive environment (such as gas, dust, smoke, etc.), please turn off the equipment when refueling or parking at the gas station.
- ② Do not place the equipment in dusty, wet or splashed places or on uneven surfaces.
- ③ Please use this equipment away from interference sources (such as TV, computer, distribution cabinet, etc.).
- ④ Do not transmit while charging.
- ⑤ Do not expose the device to direct sunlight for a long time or place it near the heating device.
- ⑥ If the equipment emits abnormal odor, it must be turned off immediately. After ensuring safety, it should be sent to the nearest maintenance site for inspection.
- ⑦ Do not modify or adjust this equipment for any reason.
- ⑧ Please obey the local laws and regulations.

Disclaimer: The customer shall bear all the responsibility for the equipment failure or accident caused by the customer's violation of the above precautions, and the company shall not be responsible for it.

2. Product Checking

Thanks for choosing our amateur radio. Please unbox and check whether the following accessories are included and well-packed. If there's anything missing or damaging after unboxed, please contact your local distributor.

Note: Public can` not use this Amateur device.

| NO | Item | Quantity |
|----|----------------|----------|
| 1 | Amateur radio | 1 |
| 2 | Antenna | 1 |
| 3 | Li-ion Battery | 1 |
| 4 | Charger | 1 |
| 5 | Belt Clip | 1 |
| 6 | User Manual | 1 |
| 7 | Guarantee Card | 1 |
| 8 | Adapter | 1 |

3. Familiar with Radio

3.1 Radio Diagram






①Antenna ②PTT ③Side-key 1 ④Side-key 2 ⑤Battery ⑥Channel & Menu Switching Knob

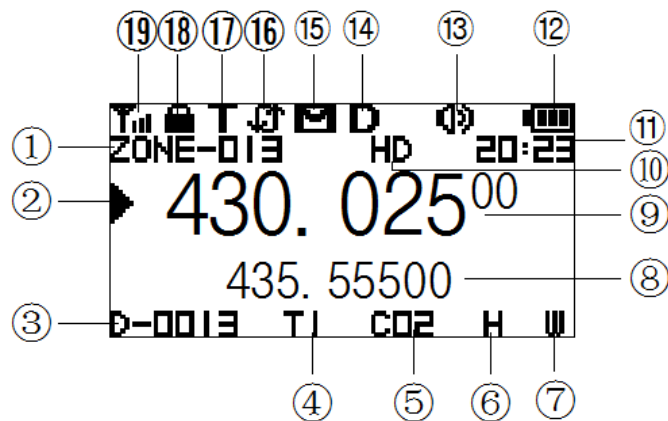
⑦ON/OFF/Volume Knob ⑧Indicator ⑨Alarm Button ⑩Speaker ⑪MIC ⑫Display Screen

⑬Keypad ⑭Earpiece and Programmable Jack ⑮Type-C Charging Port

3.2 Keypads Instruction

| Keys | Function Descriptions |
|---|---|
| PTT | Transmit or Exit |
| Alarm Key | Definable long press and short press functions |
| | DTMF : D |
| Side-key 1 | Can be selected as secondary PTT via Menu, and definable function is not available. |
| | Definable long press and short press functions |
| Side-key 2 | Definable long press and short press functions |
| | DTMF : A |
|  | Confirm or Enter in Menu |
| | DTMF : C |
|  | Enter into DTMF inputting mode, under analog channel status. |
| | Enter into dial call mode, under digital channel status. |
| | DTMF : B |
|  | Cancel or Exit Menu |
| | Switch A/B channel |
| | Delete inputting while under DTMF or dial inputting |
| 0 | Short press:input number 0 |
| | Long press:definable functions |
| | DTMF: 0 |
| | To input Number 0 or Space Bar |
| 1 | Short press to input Number 1 |
| | Long press to definable functions |
| | DTMF: 1 |
| | to input Number 1/English Letters/Chinese Characters |
| 2-9 | short press to input Number 2-9 |
| | Long press to definable functions |
| | DTMF: 2-9 |
| | to input Number2-9/English Letters/Chinese Pinyin Codes |
| * | short press to switch from channel frequency /channel number/channel Alias |
| | long press to lock the keypad |
| | DTMF: * |
| | To Delete |
| # | Switch working mode from VFO frequency mode/channel mode/zone mode |
| | DTMF: # |
| | to active inputting status and switch input methods |

3.3 LCD Icon Display



①VFO MODE /CH MODE /ZONE-XXX Mode, XXX means current working zone

②Main frequency icon ③D-XXXX Digital Channel/A-XXXX Analog Channel, XXXX means Channel number

④T1 or T2 digital Time-slot/ AM or FM Analog RX modulation

⑤CXX digital channel color codes/CTC analog channel with sub-tones/DCS analog channel with digital sub-tones/ENC analog channel with encrypted sub-tone/MUT analog channel with decoded sub-tone

⑥Power ⑦W/N Wide/Narrow Band ⑧Sub-display information ⑨Main Display information ⑩Digital Call Hold Mode ⑪System Time

⑫Battery Power ⑬Beep ⑭Dual standby ⑮Unread Message ⑯Scan ⑰R-Talk around /T-Freq Inverse ⑱Keypad Lock ⑲Signal Icon

4. Function Description

4.1 Input Frequency

① switch working mode to VFO frequency mode by pressing # key

② Input frequency via number keys, input 8 digits and the inputting done.

4.2 Input Repeater Frequency

① Enter into Menu **【Channel Set】** -> **【Offset Freq】** to input frequency difference via number keypads

② Enter into Menu **【Channel Set】** -> **【Offset DIR】** to set frequency upwards and downwards

4.3 Transmitting

①Press PTT and will transmit at current frequency, and the indicator lights up red at the same time. If it is digital channel, it will enter into digital calling interface and show up as the

called ID, name and the call type (private call, group call or all call).

② Press Menu **【Basic Set】** -> **【Main PTT TX】** and set up to **【Area A】**, press PTT button and transmit at A frequency always. If set up to **【Main Area】**, it will transmit at main frequency all the time.

③ Turn on **【Key Define】** -> **【Slaver PTT】**, then the shortcut function of side-key 1 is invalid, press side-key 1 to transmit at B frequency.

4.4 Receiving

The indicator lights up green while receiving. If the current channel is digital channel, it will enter into digital calling interface and shows up as caller ID, name and calling type (private call, group call or all call. If it is group call, it shows up as group ID)

4.5 DMR Encryption

There are 3 types of encryption available: ARC/AES128/AES256. None of the following conditions is indispensable, if two pieces encrypted radios need to communicate with each other: ① same encryption type; ② same encryption serial number; ③ same encryption keys

4.6 Dial Call

① press **┐** to enter into dial interface while under digital channel status.

② press **┐** to switch calling type;

③ to input called ID via keypad, and delete via **┘** key;

④ Press PTT to call

4.7 DTMF

4.7.1 DTMF Inputting and Sending

① press **┐** to enter into DTMF inputting interface while under analog channel.

② input DTMF code via keypads, and delete via **┘**;

③ Press PTT to call, the device will send DTMF code to receiver after appointed delay time

4.7.2 While the device enters into analog receiving status, the display will show up the sender's DTMF code if turn on DTMF decoding.

4.7.3 Press keypads to send relative DTMF code while under analog transmitting status.

4.7.4 DTMF Remote Monitor

- ① Set up a DTMF Monitor code and turn on **【DTMF Control】**
- ② other radios send DTMF code with same monitor code to this radio.
- ③ After decoding successfully, the radio will transmit for 60 seconds automatically to make remote monitor happen.

4.7.5 DTMF Stun/Kill/Activate

- ① set up a DTMF code for Stun/Kill/Activate, and turn on **【DTMF Control】**
- ② Other radios will do Stun/Kill/Activate to this radio when they send relative DTMF code.

The radio cannot be use until receive activate code once it is in Kill status. The radio can receiving, but cannot input anything via keypad or transmitting once it is in Stun status.

Note: should set up Activate code once Stun/Kill code is set up, or the device cannot be activated.

4.8 Text Input

4.8.1 Press # to switch inputting methods, press * to delete inputting when under text input status.

4.8.2 Press number keys to input numbers

4.8.3 English Letters Inputting **【AB】【abc】**

- ① Number 2-9 can input relative English letters, press Number 0 to input space, Number 1 to input English symbols.
- ② Press same button to switch to different letters.

4.9 Function of Definable keys

【Monitor(Analog)】 only available at analog channels. Enter into receiving and playing status once trigger this key.

【Power】 To switch power of current channel.

【Dual Standby】 To turn on/off dual standby. The power saving mode is invalid once the dual standby turns on.

【TX Priority】 To switch priority RX to **【Edit】** or **【Busy】**. Once set up to busy status, the main frequency will shift to the calling frequency automatically when the calling ends.

【Scanning】 Press this button to enter into scanning status, and press arbitrary keys to exit.

【Backlight On-off】 Press to turn on/off backlight.

【Roger Beep】 To switch the RX end tone types.

【FM Radio】

① press button to enter into FM status, press PTT to exit.

②press # button to switch from FM to frequency mode or channel mode. Press number keys to input FM frequency while under frequency mode. Press number keys to input FM channels while under channel mode.

③Press * button to switch from FM searching to Single Channel or Full Band mode. Long press UP or DOWN keys to search channels. Stop searching when receive channel while under single channel searching mode. To search for 16 channels and store them while under full band searching mode.

【Talkaround】 To switch repeater frequency to Talk-Around or Frequency Reverse. To transmit at RX frequency under Talk-Around status. To interchange frequency of RX and TX under frequency reverse mode.



【Alarm】 Press the button to enter into emergency alarm status and make an alarm sound, press arbitrary keys to exit.

【Freq Detect】【CTC/DCS Scan】

① press this button to enter into frequency detecting or remote sub-tone decoding mode, and the device will scan the RX signal nearby.

② press * button to switch from frequency detecting to remote sub-tone decoding.

③ press  or PTT to exit during frequency detecting, press # to switch detecting bands.

④ Press  to re-detect after detecting done. Press  to save detecting results to VFO channels, and return to standby mode. Press PTT to give up detecting results and exit detecting mode.

【Send Single Tone】 Available only at analog channels. Press this button to transmit a single frequency signal at current frequency.

【Status Query】 Press this button to check time, battery power etc.

【Remote Monitor】 Available for digital channels and Individual Call Contact. Press this button to make a 15-second call to monitor the surrounding sounds.

【Color Code Scan】 Available for digital channels only. Press this button to enter into Color Code Scanning mode to scan color codes from same digital frequencies.

【Remote Stun/Kill/Wake Up】 Available for digital channels and Individual Call only. Press this button to Stun/Kill/Activate appointed radios. The stun radio can receive signals and do nothing. The killed radios cannot be used only do activate them to remove from Stun and Kill status.

【Online Check】 Available for digital channels and Individual Call only. Press this button to check the radios turn on and at same channels or not.

【LCD Brightness】 Press this button to change the lightness of backlight. Level 0 is the most darkness, and level 4 is the brightest.

【NOAA Mode】 press this button to enter into NOAA scanning mode, and switch NOAA channels via channel knob. The radio will start to scan NOAA automatically when not any operation for 6S. The followings are NOAA frequencies.

| | | | |
|---|---------|----|----------|
| 1 | 162.550 | 7 | 162.5250 |
| 2 | 162.400 | 8 | 161.650 |
| 3 | 162.475 | 9 | 161.775 |
| 4 | 162.425 | 10 | 161.750 |
| 5 | 162.450 | 11 | 162.000 |
| 6 | 162.500 | | |

5. Menu Specifications

5.1 Radio Setting

【Radio Name】 To change the alias of this radio, can set up as the owner' s alias or calling number. When set up as 【Send Radio Name】 in menu list 【Analog Set】->【TX End Tone】, the alias of this radio will be sent out to receiver' s after analog calling ends.

【Lock Timer】 The keypad will lock automatically when there is not any operation of the radio within the appointed time while under standby status. Long press * button to unlock the keypad.

【Light Timer】 To set up the shutdown time of backlight. Set up as **【Off】** then the radio will turn off the timer, the backlight no longer turn off automatically.

【Menu Exit】 The radio will exit menu interface automatically once there is no any operation within appointed time.

【Save Mode】 To save power consumption while set up the Power Saving function. But there is delay for RX, omitting or missing messages under power saving status. Otherwise, the radio cannot set up as power saving while under dual standby status.

【Scan Mode】 Set up as **【CO】**, the radio will resume scanning once the received signal ends. Set up as **【TO】**, the radio will resume scanning after it receives signal and stay for a while. Set up as **【SE】**, the radio stops scanning once it receives signals.

【Scan Direction】 Scanning upwards and downwards.

【Scan Dwell】 To set up the signal stay time while under **【TO】** status.

【Scan Return】 Set up as **【Original CH】** too return to original status after scanning done. Set up as **【Current CH】** to stay at current channel after scanning done.

【Alarm Type】 Set up as **【Local Alarm】** to make an alarm sound once trigger alarm. Set up as **【Remote Alarm】** to send alarm signals to remote radio and this radio doesn't make any sound itself. Set up as **【Local + Remote】** this radio makes an alarms sound and send alarm signals to remote radios while trigger this function.

【Main PTT TX】 Set up as **【Area A】**, press PTT to transmit at A band. Set up as **【Main Area】**, press PTT to transmit at main band.

【Save CH】 Copy current channel to appointed channel and save it .

【Delete CH】 Delete the data of selected channel.

【LCD Contrast】 The higher the value, the deeper the contrast. And need to restart the radio to complete the setting.

【Initialization】 The frequency data will return to the last programming status.

5.2 Definable Key

【Slaver PTT】 Set up as **【On】** and the side-key 1 will be the secondary PTT. The preset functions will be invalid when press side-key 1 to transmit at B band.

5.3 Analog Communication Setting

This data is available only for analog channels.

【SQ Level】 The higher the value, the more difficult to turn on receiving.

【TX Start Tone】 To use to set up the individual call frequency.

【MIC Gain】 To adjust the MIC receiving sensibility. The higher the value, the more sensibility the MIC.

【SPK Gain】 To adjust the speaker's volume. The higher the value, the louder the speaker. To avoid audio distortion, please don't turn up the speaker highly.

【DTMF Delay】 If DTMF tone is needed, it will be sent out at appointed time.

【DTMF Interval】 To set up the interval of two DTMF codes.

【DTMF Duration】 To set up the lasting time of individual DTMF code.

【DTMF Mode】 To set up sending time of DTMF code. The radio will not send DTMF code while transmitting, when the radio set up as **【Off】**.

【DTMF Select】 To send one of 16 preset DTMF codes while transmitting.

【DTMF Display】 The received DTMF code will show up on the display once the radio set up as **【On】**.

【DTMF TX Gain】**【DTMF RX TH】** There are difficulties while decoding DTMF codes of different brands radios. By adjusting the value of these two options, the DTMF codes of different brand radios can be compatible. Encode gain 64 and decode threshold 24 are recommended.

【DTMF Control】 Other radios can take charge of this radio by sending same DTMF code of monitor/Stun/Kill/Activate, when the radio set up as **【On】**.

5.4 Digital Communication Setting

This data is available only for digital channels.

【Personal ID】 To set up numeric ID, ID ranges from 1-16776415.

【Group Hold (unit: ms)】 This radio make calls within the appointed time after the end of

group call, and the receiving part will be the called one.

【Single Hold (unit: ms)】 This radio make calls within the appointed time after the end of individual call, and the receiving part will be the called one

【SQ Level】 To set up the squelch of digital communication. The smaller the value, the easier to turn on the squelch. Note that the radio will not be in power saving mode once the squelch level is too small.

【Contacts Set】 To set up Add/Delete/Modify contact list. Note that there is only one all call contact and cannot be changed and deleted. Contact ID ranges from 1-16776415.

【Group List Set】 To set up Add/Delete/Modify receiving group contact list. Press **┐** to select group call members and the selected members will turn to black background. And press **—** **┘** to cancel.

【Encryption Set】 To set up DMR encryption of this radio.

5.5 Channel Setting

5.5.1 Analog Channel Setting

【CTC/DCS】【RX CTC/DCS】【TX CTC/DCS】 To set up sub-tone of current channel. To switch the types via * key.

【DCS Enrcrypt】 Set up as **【Encrypt 1/2/3】** to encrypt with standard DCS and only valid for DCS. Set up as **【Mute Code】**, the sub-tone of current channel is invalid and use **【Mute Code 1/2/3】** as sub-tone of current channel.

【Mute Code 1/2/3】 To decode non-standard digital sub-tone via one-click privacy decode function.

【Scan Add】 Set up as **【Remove】**, the radio will not scan this channel while scanning.

【Offset Dir】 Set up **【Offset Freq】** before setting up frequency direction. When selects **【Upward】**, the TX frequency = RX frequency + frequency difference. When selects **【Downward】**, the TX frequency = RX frequency - frequency difference

【Offset Freq】 Set up frequency difference as 0, if need to turn off the frequency difference of current channel.



5.5.2 Digital Channel Settings

【DMR Mode】 There is no time slot difference when set up as **【Dual Slot Off】**, and can communicate with each other once the frequency and color code are the same. The radios can communicate only with same time slot when set up as **【Dual Slot On】**.


【DMR Slot】 The time slot of current channel is valid only when set up as **【Dual Slot On】**.

【TX Politely】 The device can make calls whether it is under called or not when set up as **【Impolite】**. The device cannot make calls whether it is called or not when set up as **【Carrier Match】** and current frequency is occupied. The device cannot make calls while it is called by others, when set up as **【CC Match】**.

5.6 Zone Setting

It has 256 zones and can be editable. Use  key to choose the members of current zone, and press  key to delete.

5.7 SMS

【New SMS】 Can be edited and press menu key to select **【Send】** or **【Save】**. SMS can be sent to the receiver via **【Contacts】** or **【Dial No.】** to select ID and sending type. To switch call types to **【Individual】** or **【Group Call】** via  key while under **【Dial No.】** status. The editing SMS text will be save to **【Drafts】**, when set up as **【Save】**.

【Inbox】 to save the incoming SMS and up to 256 pieces of SMS. Each SMS includes followings:

- ① Time: Receiving time;
- ② Type: Individual/group/all call;
- ③ ID: The sender ID
- ④ Name: The contacts in the contact list. If not in the list, this item is blank.
- ⑤Text: SMS text. The number means the line number.

You can do the following operation after reading the SMS: **【Reply】** (Edit reply SMS and send to sender), **【Forward】** (Forward the SMS to others) or **【Delete】**.

【Outbox】 to save sent SMS, and up to 256 pieces of SMS, Each SMS includes followings

- ① Time: Sending Time

② Status: Sent or Fail;

③Type: Private/Group/All Call

④ ID: Receiver ID

⑤ Name: the contacts in the contact list. If not in the list, this item is blank.

⑥ Text: SMS text. The number means the line number.

You can do the following operation after reading the SMS: **【Resend】** (Re-send the SMS)、**【Forward】** (Forward the SMS to others) or **【Delete】**.

【Drafts】 Save unfinished SMS, and up to 256 pieces of SMS

【Default SMS】 Pre-edited and programmed SMS via PC ,and save up to 16 pieces.

【Clear All SMS】 Delete all things of **【Inbox】**、**【Outbox】****【Drafts】**

5.8 FM Radio

Set up **【Work Mode】** as **【Freq Mode】**, the inputting is FM radio frequency values when under FM radio status. Use channel knob to switch frequencies. Set up as **【CH Mode】**, the inputting is FM channel numbers, use channel knob to switch FM channels.

【RX Standby】 Set up as **【On】**, the radio can standby the calling signals of main frequency while under FM radio status.

【Scan Mode】 Set up as **【One Station】**, the FM radio will stop searching channels once it search available channel and save the channel frequency into current channel. Set up as **【All Range】**, the radio will stop searching channels once it search for 16 channels and save them to FM radio channels.

【Area】 The radio has 16 FM radio zones, and 16 channels per zone. And zone name can be editable and set up as **【Set As Current】**.

【Channel】 16 channels of current FM zone, and the frequency value can be editable and set up as **【Set As Current】**.

5.9 Time Management

【APO】 To **【On】** or **【Off】** the auto shutdown function.

【APO Timer】 If not do any actions on the radio , the radio will shut down automatically when

activate this function.

6. Specifications

| General Part | |
|-------------------------|--|
| Frequency Range | FM: 64-108MHz RX/ Scanning:136-174MHz, 400-470MHz TX:144-148MHz, 420-450MHz (Amateur Band) |
| Channel Capacity | 1024 Channels +2*VFO channels |
| Channel Spacing (W/N) | Analog:25kHz/12.5kHz Digital:12.5K |
| Voltage | 7.4V DC |
| Working Mode | Same frequency simplex, different frequency simplex |
| Antenna | Removable Antenna |
| Frequency Stability | $\pm 2.5\text{ppm}$ |
| Working Temperature | $-20 \sim +60^{\circ}\text{C}$ |
| Dimension | about 255g |
| Transmitting | |
| Modulation Mode | FM, 4FSK |
| Maximum deviation (W/N) | $\leq 5\text{KHz}$ / $\leq 2.5\text{KHz}$ |
| SNR (W/N) | -45dB/ -40dB |
| TX Current | $\leq 1500\text{mA}$ |
| Receiving | |
| Sensitivity (W/N) | $0.22 \mu\text{V}$ / $0.25 \mu\text{V}$ 12dB SINAD |
| Inter modulation (W/N) | 65dB/ 60dB |
| Audio Distortion | $< 5\%$ |
| Audio Output Power | $\leq 1\text{W}$ (16Ω) |
| RX Current | $\leq 350\text{mA}$ |
| Standby Current | $\leq 70\text{mA}$ |

Note: The above parameters are subject to change without prior notice!

Company Name: Iradio Electronics Co., Ltd.

Address: No.16 Daxiamei Industrial Area, Nan'an, Quanzhou City, China

Any 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.

Note: 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.

SAR tests are conducted using standard operating positions accepted by FCC with the device transmitting at its highest certified power level in all tested frequency bands, although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. Before a new model is available for sale to the Occupational/Controlled it must be tested and certified to the FCC that it does not exceed the exposure limit established by the FCC. Tests for each product are performed in positions and locations as required by the FCC.

For body worn operation, this device has been tested and meets the FCC RF exposure guidelines when used with and accessory designated for this product or when used with and accessory that contains no metal.

To maintain compliance with FCC RF exposure guidelines hold the transmitter and antenna at least 1 inch (2.5 centimeters) from your face and speak in a normal voice, with the antenna pointed up and away from the face.

The equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to comply with the FCC RF exposure requirement, the antenna installation must comply with following:

Users must be fully aware of the hazards of the exposure and able to exercise control over their RF exposure to qualify for the higher exposure limits.

Your wireless hand-held portable transceiver contains a low power transmitter. This product sends out radio frequency (RF) signals when the Push-to-Talk(PTT) button is pressed.

The device is authorized to operate at a duty factor not to exceed 50%.