KIRISUN

Professional wireless communication system solution supplier

INSTRUCTION MANUAL

FP420
Digital Two-way Radio

DIGITAL

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NOTE：

7PIZ-4039-E01A

Instruction Manual

FP420
Digital Two-way Radio

We are very grateful for your purchasing KIRISUN brand two-way radios produced by Kirisun Communications Co., Ltd.

We believe KIRISUN two-way radio, which always incorporates the latest technology, can bring great convenience to your life and work.

We also believe that the quality and function of KIRISUN two-way radio can meet your demands for reliable communication.

Notice to user

◆ Copyright

Kirisun and our authorized partners own the intellectual property of all the parts of this product (include accessories). Any design and materials may not be modified, copied, extracted or translated without the authorization of Kirisun or its authorized parities.

Due to the update or modification of the product, Kirisun owns the right to change the specifications of software and hardware described in this manual without further notice. Specifications and information contained in this manual are for reference only.

◆ Safety Information

Compliance with RF Exposure Standards

Your radio is designed and tested to comply with a number of national and international standards and guidelines (listed below) regarding human exposure to radio frequency electromagnetic energy. This radio complies with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at operating duty factors of up to 50% transmitting. In terms of measuring RF energy for compliance with the IEEE and ICNIRP exposure limits, your radio radiates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode.

Your radio complies with the following of RF energy exposure standards and guidelines

Institute of Electrical and Electronic Engineers (IEEE) C95.1-1992

Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition

International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998

◆ Operating Instructions to control RF Exposure

To decrease your exposure and ensure compliance with the occupational/controlled environment exposure limits, please always adhere to the following procedures.

1. Transmit no more than the rated duty factor of 50% of the time. To transmit, press the PTT button, and to receive the call, release the PTT button.

2. Keep your radio in a vertical position in front of the face with the microphone 5cm away from your mouth while transmit.

3. When worn on your body, keep the antenna 2.5cm away from you body while transmit.

4. Do not transmit when the radio is not equipped with an antenna. Transmitting without an antenna may damage the product and result RF discomfort.

◆ Using the designated accessories

Use the antenna, battery, adapter or charger supplied or sold by Kirisun only, or otherwise it causes damage to the product.

If you want to purchase or replace the accessories, please contact your local dealer or Kirisun.

◆ Area restrictions

1. To avoid of the problems caused by electromagnetic interference or electromagnetic compatibility, turn off the radio in any facilities where posted notices instruct you to do so, such as hospital and other health care facilities. Turn off the radio when on board an aircraft, if instructed to do so.

2. In the vehicle with an air bag, do not place the radio in the area over an air bag or in the air bag deployment area.

3. Turn off the radio before entering any area with a potentially explosive atmosphere or blasting caps.

4. Do not operate the radio, disassemble or charge the battery in the potentially flammable and explosive atmosphere (such as gas station, coal gas station, etc.).

5. Do not place the radio under the direct sunlight or near the area with heating devices.

6. Do not place the radio in the area with great dust, moisture or drips, or on the unstable surface.

◆ Operating Attentions

Antenna

Do not use any portable radio that has a damaged antenna. If a damaged antenna comes into contact with your skin, a minor burn can result.

Batteries

All batteries can cause property damage and/or bodily injury, such as burns, if a conductive material such as jewelry, keys, or beaded chains touches exposed terminals. The conductive material may complete an electrical circuit (short circuit) and become quite hot. Excessive care in handling any charged battery, particular when placing it inside a pocket, purse, or other container with metal objects. To reduce the potentially damage, do not expose the battery in the fire, or disassemble and extrude the battery.

To realize the best performance of the battery, change the battery once a year.

Maintenance

Do not disassemble the radio by yourself. This product can only be maintained by the professional technicians. Contact us or your local dealer for help if you want to re-develop or modify the radio.

Contents

1 Unpacking and checking

Unpack the radio carefully. We recommend that you check the radio and the supplied accessories listed in the following table before discarding the packing material. If any damage or loss has occurred during shipment, please contact the deliveryman or the dealer without delay.

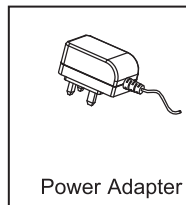| ITEM	QUANTITY
Two-way radio	1
Antenna	1
Battery	1
Belt Clip	1
Charger	1
Power Adapter	1
Hand Strap	1
Instruction Manual	1
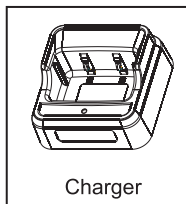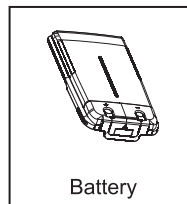
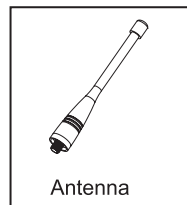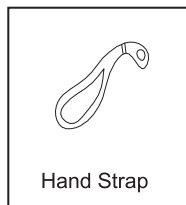Charger   Battery   Belt Clip and Screws
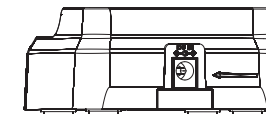
Power Adapter   Antenna   Hand Strap

2 Preparing Your Radio for Use

2.1 Charging the Battery

Plug the power adapter into an applicable AC outlet and connect the power adapter to the battery charger. The green LED lights up.

Insert the battery or the radio into the charger slot. Make sure the battery is well connected with the charger. Then the red LED lights up, it indicates that the charging starts. When the LED light green, it indicates the battery has been full charged.
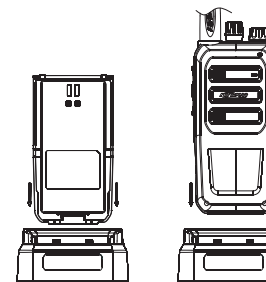
Charging Notice
※ The radio's battery is not fully charged before shipment. Before the initial use, please charge the battery. Charging/discharging twice or triple can let the battery capacity in the best status. When the battery is in low power, it needs to be charged or change another battery.
※ Do not recharge the battery if it has been fully charged or the radio is not in the low battery alarm

state; otherwise, it shortens the battery's life time and performance.

※ To make sure the battery can be full charged, please turn off the radio while charging.

※ Please do not put the radio in the charger when it does not need to, charging in cycle shortens the battery's life time and performance.

※ Please do not let the terminal of battery in short circuit or throw the battery into fire.
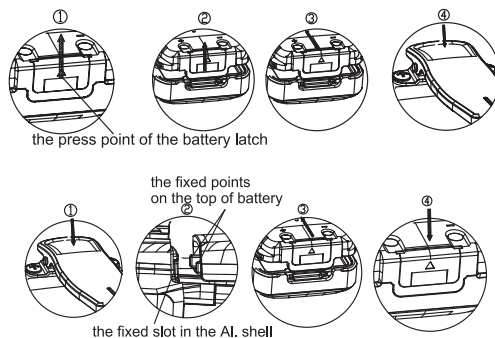
※ You'd better place the battery in 25℃ ambient environment. The battery is easy to lose efficiency if long stayed under -10℃ environment.

※ If the temperature is higher than 35℃ or lower than -10℃, the electro-discharge will be reduced by the Li battery's physics characters.

2.2 Attaching the Battery

If the belt clip is attached, press down the belt clip first; match the two grooves on the battery to that of on the radio back. Then press down the bottom of the battery until it locks.

Removing: Press down the battery latch and push backwards until it separates from the radio.

the press point of the battery latch

the fixed points on the top of battery

the fixed slot in the Al. shell
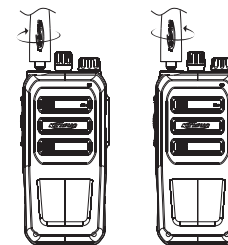
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TWO-WAY RADIO

Note:

Do not short-circuit the battery or discard in the fire.

Do not disassemble the cover of the battery by your own.

2.3 Attaching the Antenna

Hold the base of the antenna and turn the antenna clockwise into the connector on the top of the radio until secure.

Removing: Hold the base of the antenna and turn the antenna anti-clockwise and remove it.
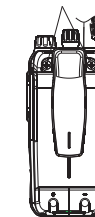
2.4 Attaching the Belt Clip

Match the holes on the belt clip to that of on the radio; fasten it with two 2.5*6.5 screws.

To remove the belt clip, loosen the two screws.

M2.5*6.5 screw to fasten the belt clip

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TWO-WAY RADIO

2. 5   Attaching the External Earphone

Open the cover for external equipment, and then insert the earphone plug into the jacks on the radio.
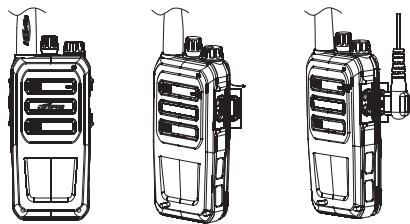
2. 6   Powering on/off the Radio

With the radio turned off, turn the On/Off/Volume Knob clockwise until you hear a click to turn on the radio; when the radio turns on, turn the On/Off/Volume Knob counterclockwise until you hear a click to turn off the radio.

2. 7   Adjusting the Volume

Rotate the Volume Knob to adjust the volume.

3   Identifying Radio Controls

3. 1   Radio Controls
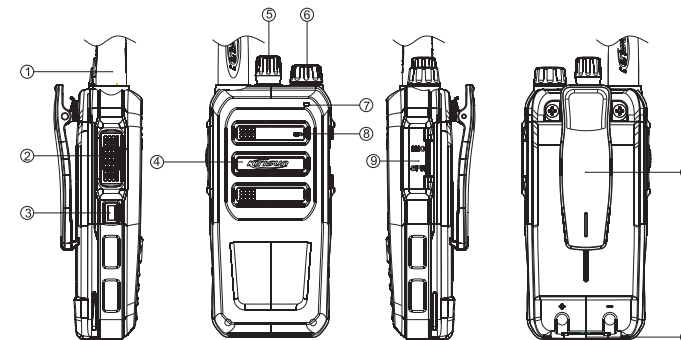
① Antenna

② PTT Button

Press the button to make a call.

③ PF Button (programmable)

This button can be programmed with different functions by your dealer, the functions of which refer

to Section of Programmable button.

④ Speaker

To output voice.

⑤ Channel Knob

Rotate it to select channel 1-16.

⑥ On/Off/Volume Knob

Turn it clockwise to turn on the radio. Turn it counterclockwise until you hear a click to turn off the

radio.

With the radio turned on, turn it to increase/decrease the volume.

⑦ LED Indicator

LED indicator lights in red when transmit signal; LED indicator lights in green when receive signal.

LED indicator flashes red when the battery voltage is low.

⑧ Microphone

To input voice.

⑨ Connector for External Equipment

Remove the cover to plug in the external speaker, microphone or other external equipments.

⑩ Belt Clip

⑪ Battery Latch

3.2 **Programmable Buttons**

In order to facilitate your usage, you can program the following buttons as function shortcut keys by
your dealer:

Name	Operation	Functions
PF button	Long/short press	See below
Note: Short press: press the key and release it soon; Long press: press and hold the key for at least 2s.		

Functions programmable:

None: No feature will be assigned.

Power Level Adjust: Toggles transmit power level between high and low.

Monitor: If the current analog channel is configured with CTCSS/CDCSS, the CTCSS/CDCSS will

be canceled and the radio switches to carrier squelch mode when press the key, which means if the carrier received matches with the frequency of the current channel, the radio sounds. Press the key again to return to the default setting.

Emergency Alarm On: Allows the user to set up an emergency call to seek help under the emergency condition.

Emergency Alarm Off: Allows the user to terminate an outgoing emergency call.

Squelch on/off: Turns on/off the squelch function. The weak signal can be received on the analog channel.

Squelch Level Adjust: Allows the user to set the Squelch Level. The higher squelch level is selected, the harder to receive weak signals, but the more rarely disturbed by the noise.

Scan: Turns on/off scanning function to search the communication activity on other channels.

Whisper: Turns on/off whisper function. If this function is enabled, the receiver can hear the voice from the transmitter clearly even the voice is very low.

3.3 **LED Indicators**

The LED indicator shows the operational status of your radio.

Blinking red— Radio is transmitting at low battery condition or during scan
Solid Red— Radio is transmitting
Solid green— Radio is receiving.
Blind yellow —Radio is during the hang time or during receiving of emergency.
Solid yellow—The radio is killed or the channel is unprogramed.

4   **Basic Functions**

4.1 **Selecting a channel**

Under the Home Screen, turn the Channel Knob to select a channel.

4.2 **Making a call**

On a digital channel, press the PTT Button and speak to the MIC. The call out number is the default contact number of this channel, which can be programmed by your dealer.

4.3 **Receiving a call**

When the radio receives signal on the current channel, the LED lights in Green. If it is the digital channel, the radio output the voice when receiving a call with your own Radio ID, your Group Call

or All Call ID on this channel; if it is the analog channel, the radio output voice when receiving the call with CTCSS/CDCSS that is the same with CTCSS/CDCSS set up on your selected channel, or there is no CTCSS on the current channel.

4.4 **Answering a call**

On a digital channel, when the radio receives a call, you can answer the call by pressing the PTT Button within Call Hold Time. If the time expires, you need to redial. The Call Hold Time can be set by your dealer.

On an analog channel, when the radio receives a call, press the PTT Button to answer the call directly.

5 Advanced Functions

5.1 **Time-out Timer**

This function forbids you from occupying the channel for a long time. If the continuous transmitting time exceeds the setting time by dealer, the radio sends out a warning tone and stops transmitting. Release the PTT Button to stop the warning tone. After a period of time, which is set by dealer, you

can transmit again. And if the radio is programmed with pre-alert function by the dealer, the radio will send out an alert before the time out timer expires.

5.2 **Scan**

Scan function helps you to receive calls from other channels, so as to supervise the activities of the personnel.

During scanning, the radio checks every channel in the scan list and stops on the channel which a signal is detected. The scanning mode is carrier-control, which has been preset by your dealer.

Carrier-control scan

During scan, the radio checks and stops on a busy channel. Then the radio continues scanning until the channel is idle for a while (this time is set by your dealer, which is named as Scan Hold Time).

Scan revert channel

While scanning, press the PTT Button to make the radio transmit on a default channel. This channel can be programmed by your dealer.

5.3 **Radio kill/revive**

This function allows one radio to be killed or revived . The radio to be killed cannot make or receive calls. The radio can only revive through CPS sends a revive order or be reprogrammed. After revived, the radio can work normally again. This function is used to manage the unauthorized usage of the radio, prevent misappropriating the radio which is lost.

5.4 **Emergency Alarm**

If you are in danger and this function is enabled, you can press Emergency Alarm On shortcut key to send an emergency alarm.

The means of sending emergency alarm are decided by the following parameters: Alarm Type, which defines the audio and visual reaction when the radio sends an alarm; Alarm Mode, which defines the content sent to the other members when the radio sends an alarm. The above parameters can be programmed by dealer.

To turn off the Emergency Alarm, press the programmed Emergency Alarm Off shortcut key.

Alarm Type:

◆None: No alarm function (Default setting); you cannot send an emergency alarm.

◆Siren Only: The radio only emits siren locally.

◆Regular: The radio provides audio and visual indication that it is in Emergency mode and can receive the signal from others;

◆Secret: No audio and visual indication. And the radio cannot receive the signal from others;

◆Secret with voice to follow: No audio and visual indication. But the radio can receive the signal from others.

Alarm Mode:

◆Emergency Alarm: The radio sends out an emergency alarm, and then exits the emergency alarm status automatically.

◆Emergency Alarm w/ Call: An emergency alarm is sent, after which an emergency call can be transmitted by pressing the PTT Button.

◆Emergency Alarm w/ Voice to Follow: The radio sends out an emergency alarm, and then sends out background tone periodically and automatically through emergency call.

Note:

Emergency Alarm: The radio sends out a signal to alert other member.

Emergency Call: A priority call on channel, so as to make sure the successful communication under emergency condition.

6 Troubleshooting

No.	Problem	Causes and Solutions
1	The radio cannot be switched on or no display after being switched on.	A. The power switch is in failure. Please change it. B. The battery is out of power, please recharge it or change it.
2	The voice is low.	A. Please speak close to the microphone. The ideal distance is 3-10cm. B. Please turn the Volume Knob to increase the volume to the best.
3	Cannot transmit	A. The frequencies of both users are not the same. Please select the same frequency channel again. B. The CTCSS/DCS signals of both users are not the same. Please reset it. C. The radio is out of effective communication range.

7 Specification

General	
Frequency Range	400-470MHz/136-174MHz
Channel Capacity	16
Channel Spacing	6.25KHz/12.5KHz
Operating Temperature	-25℃~ +55℃
Operating Voltage	7.5V DC ±20%
Battery	1500mAH Li-ion
Frequency Stability	±2.5 ppm
Dimension (with battery and antenna)	116mm x54mmx30mm
Weight (with battery and antenna)	243g
Transmitter	
RF Power Output	4W/ 1W
Frequency Modulation	16KφF3E/11KφF3E (Analog)

	4FSK(Digital)
Antenna Impedance	50Ω
Modulation Limiting	±2.5kHz
Radiated Spurious Emission	-36dBm < 1GHz -30dBm > 1GHz
FM Noise	45dB @ 25KHz 40dB @ 12.5KHz
Modulation Distortion	< 3%
Receiver	
Reference Sensitivity	0.25μV @12.5KHz
Adjacent Channel Selectivity	60dB @ 12.5KHz
Intermodulation	60 dB
Spurious Response Rejection	60 dB
Rated Audio Output	1W
S/N	45/40
Rated Audio Distortion	≤3%

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