

Industrial-grade AI noise-cancellation Solution Integrator



## **Lightweight AI Noise-Canceling Radio WS2P User Manual**

200g | Portable | Clear

## 1. Safety Guidelines and RF Exposure



Before operating this radio, please read this manual carefully. It contains essential instructions for safe usage and RF energy awareness to ensure compliance with national and international RF exposure standards.

### *RF Exposure Compliance*

To ensure compliance with general population or uncontrolled environment exposure limits, strictly adhere to the following procedures:

- **Transmit/Receive Duty Cycle:** Do not transmit (press the PTT button) for more than 50% of the total usage time. The radio generates measurable RF energy only during transmission.
- **Face-to-Face Operation:** Hold the radio in a vertical position in front of the face. Keep the microphone (and all other parts of the radio, including the antenna) at least **1 to 2 inches (2.5 to 5 cm)** away from the lips.
- **Body-worn Operation:** Always use WaveSync-approved belt clips, holsters, or cases. If not using a body-worn accessory, maintain a minimum distance of **1 inch (2.5 cm)** between the antenna and your body during transmission.

### *Medical Device Safety*

- **Pacemakers:** The Advanced Medical Technology Association (AdvaMed) recommends maintaining a minimum separation of 6 inches (15 cm) between a handheld wireless radio and a pacemaker. These recommendations are consistent with the regulations of the U.S. Food and Drug Administration (FDA). Persons with pacemakers should observe the following precautions:
  - Always keep the radio at least 6 inches (15 cm) away from the pacemaker when the radio is turned ON.
  - Do not carry the radio in a breast pocket.
  - Use the ear opposite the pacemaker to minimize potential interference.
  - Turn the radio OFF immediately if you suspect that interference is taking place.
- **Hearing Aids:** Some digital wireless radios may interfere with certain hearing aids. Consult the manufacturer to discuss alternatives.
- **Other Medical Devices:** Consult the manufacturer of any personal medical device to determine if it is adequately shielded from RF energy.

### *Restricted Environments*

- **Hospitals/Clinics:** Turn off the radio where posted regulations require it.
- **Airports/Aircraft:** Radio use is strictly prohibited in these areas.
- **Explosive Atmospheres:** Turn off the radio before entering fuel areas, chemical transfer facilities, or any area containing sparks/explosive gases. **Do not remove, install, or charge batteries in these zones.**
- **Blasting Zones:** Turn off the radio near electrical blasting caps or in areas posted: "Turn off two-way radio."

## 2. Operational Warnings and Precautions

- **Vehicle Safety:** Never place the radio on or near an airbag deployment area. The force of an inflating airbag can propel the radio with enough speed to cause severe injury.

- **Magnetic Interference:** The speaker contains a permanent magnet. Keep the radio at least **10 cm** away from TV screens and computer monitors to prevent magnetization/distortion.
- **Hardware Protection:**
- **Antenna:** Do not use a radio with a damaged antenna. Skin contact with a damaged antenna during transmission can cause minor burns.
- **Short Circuit:** Prevent battery terminals from contacting conductive materials (jewelry, keys, etc.). This can cause the battery to overheat, leading to burns or fire.
- **Hearing Safety:** Set the volume to low before using an earpiece. Avoid placing the speaker directly against the ear when the volume is high.

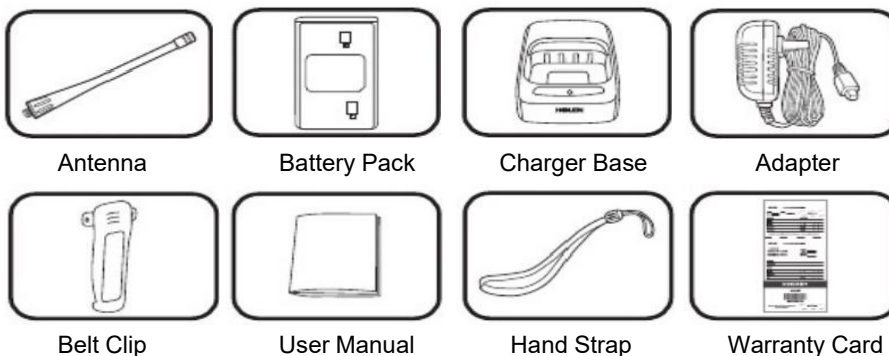
### 3. Charger Safety Precautions

- Do not expose the charger to rain, snow, or moisture.
- Do not disassemble the charger or operate it if it has been dropped or damaged.
- Always pull by the plug rather than the cord when disconnecting to avoid damaging the wire.
- **Extension Cord Requirements:** Use is not recommended unless absolutely necessary.
- **Under 30 meters:** 18 AWG wire required.
- **Under 45 meters:** 16 AWG wire required.
- Unplug the charger before maintenance or cleaning to reduce the risk of electric shock.

### 4. Unpacking and Checklist

Please verify that the following items are included in the package. If any item is missing or damaged, contact WaveSync or your authorized dealer.

Item	Quantity
Rubber Antenna	1
Li-ion Battery Pack	1
Charger Base	1
Power Adapter	1
Belt Clip	1
User Manual	1
Braided Hand Strap	1
Warranty Card	1



### 5. Battery and Charging Management

#### *Battery Characteristics*

- New batteries reach optimal capacity only after **2 to 3 full charge/discharge cycles** .

- To extend battery life, remove the battery from the radio when not in use for long periods and store in a cool, dry place (below 25°C).

### Charging Steps

1. Connect the power adapter to an AC outlet.
2. Insert the DC plug into the jack on the back of the charger base.
3. **Turn off the radio.** Insert the radio or battery into the charger.
4. Confirm the battery contacts are touching the charger terminals. The LED will turn Red.
5. Standard charging time is approximately **5 hours** .

### Low Battery Warning

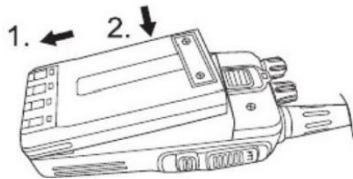
When voltage drops to the preset limit, the LED will flash red and a voice prompt will sound every 30 seconds. Transmission will be disabled.

- **English Prompt:** "Check the Battery"
- **Chinese Prompt:** "请充电" (Configurable via software)

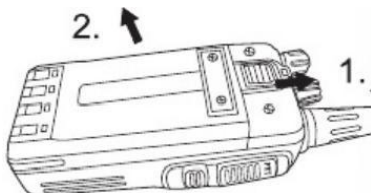
### LED Indicators

Status	LED Indicator
Power On	Orange (illuminates for 2s then turns off)
Normal Charging	Solid Red
Fully Charged	Solid Green
Fault (Over-temp/Short-circuit)	Flashing Red

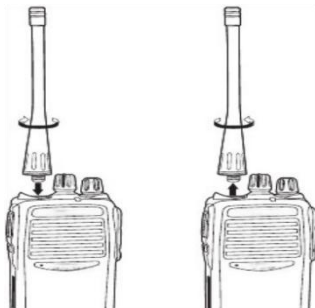
### 6. Hardware Installation Guide



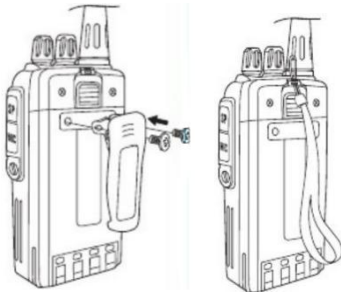
- **Battery Installation:** Align the two protrusions at the bottom of the battery with the positioning holes at the bottom of the radio. Press the battery down until the top buckle locks into place.



- **Battery Removal:** Turn off the radio. **Push the battery buckle at the top of the radio upwards** to release the latch, then pull the battery away from the chassis.

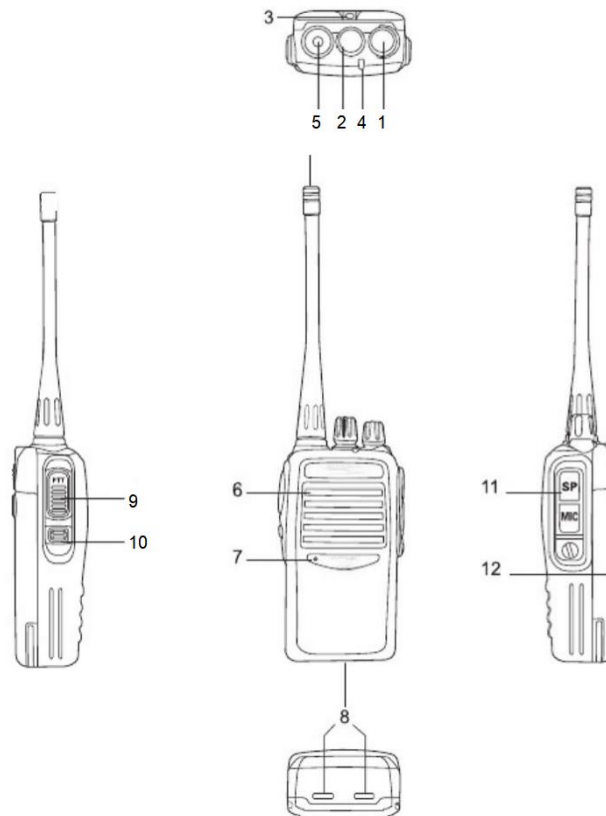


- **Antenna:** Hold the base of the antenna and rotate it **clockwise** until tightly secured.



- **Belt Clip & Hand Strap:** Slide the belt clip into the grooves on the back of the radio. Thread the hand strap through the dedicated hole at the top corner of the device.

## 7. Getting Acquainted



1. **Power/Volume Knob:** Clockwise to power on/increase volume; Counter-clockwise to decrease/power off.
2. **Channel Selector:** Rotate to select channels 1-16.
3. **Hand Strap Hole:** Attachment point for the braided strap.
4. **LED Indicator:** Red (TX), Green (RX), Flashing Green (Scan).
5. **Antenna:** High-gain rubber antenna.
6. **Speaker:** Audio output.
7. **Microphone:** Audio input.
8. **Battery Positioning Hole:** Secures the battery base.
9. **PTT (Push-to-Talk) Button:** Press to talk, release to receive.
10. **MONI (Monitor) Key:** Toggles the AI noise-cancellation filter, and deactivates squelch to monitor weak signals.
11. **Earphone/Programming Jack:** Interface for SP/MIC and PC programming.
12. **Battery Pack:** 1200mAh Li-ion source.

## 8. Basic Operations

- **AI Noise-Cancellation:** The WS2P features an integrated **AI noise-cancellation solution**. This feature can be manually toggled on and off to suit your environment—simply press the MONI button on the device to switch the AI noise-cancellation on or off. The AI processor identifies and filters background noise in real-time, ensuring only clear human voice is transmitted.
- **Squelch (SQL) Adjustment:** This filters out background noise when no signal is present.
- Adjustable from **Level 0 to 9** via software.
- **Level 2** is the default.
- **Note:** Higher levels require a stronger signal to open the speaker.
- **Transmitting/Receiving:** Hold the PTT button to transmit (LED glows Red). Hold the radio 2.5–5 cm from your face. Release to receive (LED glows Green on incoming signal).

## 9. Advanced Features

- **Scan Function:** Channel 16 is designated for scanning.
- **Critical Note:** Scanning will not initiate unless at least **two channels** (between 1-15) have been marked as "Scan Add" via programming software.
- **Busy Channel Lockout (BCL):**
  - *Off:* Transmit at any time.
  - *Carrier:* Transmission inhibited if the channel is busy.
  - *Signaling:* Transmission inhibited if the channel is busy and QT/DQT does not match.
- **QT/DQT (CTCSS/DCS):** Use sub-audio signaling to ignore unwanted calls on the same frequency.
- **TOT (Time-Out Timer):** Limits continuous transmission to prevent frequency hogging. Default is **60 seconds** (range 15-300s).
- **Power Saving:** Automatically enters sleep mode after **5 seconds** of inactivity.

## 10. PC Programming

Connect the radio to a computer using a WaveSync programming cable via the SP/MIC jack.

- **Power Settings:** Switch between **High (5W)** for maximum range and **Low (2W)** to conserve battery.
- **Bandwidth:** Choose between Wide (25KHz) and Narrow (12.5KHz) per channel.
- **Squelch:** Recommended setting is Level 2 for general industrial environments.

### *Factory Default Settings:*

- **Squelch Level (SQL):** Level 2
- **Output Power:** 4W (High) / 1W (Low)
- **Voice Prompt:** Chinese
- **Time-Out Timer (TOT):** 60 Seconds
- **Note:** These settings can be reconfigured via PC programming, or you can contact WaveSync for customized requirements.

## 11. Technical Specifications

### *General Specifications*

Parameter	Specification
Frequency Range	400 - 470 MHz
Channel Capacity	16
Channel Spacing	25KHz (Wide) / 12.5KHz (Narrow)
Operating Voltage	DC 7.4V
Battery	1200mAh Li-ion

Operating Temperature	-20°C to +55°C
Antenna Impedance	50Ω
Dimensions (Excl. Antenna)	115 x 59 x 35 mm
Weight (Incl. Battery/Antenna)	Approx. 200g

*Default Channel Table*

Channel	Frequency (MHz)	Bandwidth	QT/DQT
CH1	464.5	Wide	67.0Hz
CH2	464.55	Wide	67.0Hz
CH3	467.7625	Wide	67.0Hz
CH4	467.8125	Wide	67.0Hz
CH5	467.85	Wide	67.0Hz
CH6	467.875	Wide	67.0Hz
CH7	467.9	Wide	67.0Hz
CH8	467.925	Wide	67.0Hz
CH9	461.0375	Wide	67.0Hz
CH10	461.0625	Wide	67.0Hz
CH11	461.0875	Wide	67.0Hz
CH12	461.1125	Wide	67.0Hz
CH13	461.1375	Wide	67.0Hz
CH14	461.1625	Wide	67.0Hz
CH15	461.1875	Wide	67.0Hz
CH16	461.2125	Wide	67.0Hz

12. Troubleshooting

Problem	Solution
No Power	Battery is dead (recharge) or poorly installed (reinstall battery).
Short Battery Life	Lifespan has ended (replace battery). Do not overcharge.
Cannot talk to group	Out of range, or Frequency/QT/DQT settings mismatch.
Hearing other voices	Interference present; change QT/DQT settings for all group radios.

13. Appendix: Signaling Reference Tables

*50 Groups CTCSS (Hz)*

67.0	88.5	114.8	151.4	177.3	203.5	250.3
69.3	91.5	118.8	156.7	179.9	206.5	254.1
71.9	94.8	123.0	159.8	183.5	210.7	
74.4	97.4	127.3	162.2	186.2	218.1	
77.0	100.0	131.8	165.5	189.9	225.7	
79.7	103.5	136.5	167.9	192.8	229.1	
82.5	107.2	141.3	171.3	196.6	233.6	
85.4	110.9	146.2	173.8	199.5	241.8	

*105 Groups DCS (Normal Mode "N")*

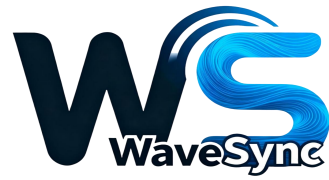
No.	Code	No.	Code	No.	Code	No.	Code
1	023N	28	155N	55	325N	82	516N
2	025N	29	156N	56	331N	83	523N
3	026N	30	162N	57	332N	84	526N
4	031N	31	165N	58	343N	85	532N

5	032N	32	172N	59	346N	86	546N
6	036N	33	174N	60	351N	87	565N
7	043N	34	205N	61	356N	88	606N
8	047N	35	212N	62	364N	89	612N
9	051N	36	223N	63	365N	90	624N
10	053N	37	225N	64	371N	91	627N
11	054N	38	226N	65	411N	92	631N
12	065N	39	243N	66	412N	93	632N
13	071N	40	244N	67	413N	94	645N
14	072N	41	245N	68	423N	95	654N
15	073N	42	246N	69	431N	96	662N
16	074N	43	251N	70	432N	97	664N
17	114N	44	252N	71	445N	98	703N
18	115N	45	255N	72	446N	99	712N
19	116N	46	261N	73	452N	100	723N
20	122N	47	263N	74	454N	101	731N
21	125N	48	265N	75	455N	102	732N
22	131N	49	266N	76	462N	103	734N
23	132N	50	271N	77	464N	104	743N
24	134N	51	274N	78	465N	105	754N
25	143N	52	306N	79	466N		
26	145N	53	311N	80	503N		
27	152N	54	315N	81	506N		

105 Groups DCS (Inverted Mode "I")

No.	Code	No.	Code	No.	Code	No.	Code
1	023I	28	155I	55	325I	82	516I
2	025I	29	156I	56	331I	83	523I
3	026I	30	162I	57	332I	84	526I
4	031I	31	165I	58	343I	85	532I
5	032I	32	172I	59	346I	86	546I
6	036I	33	174I	60	351I	87	565I
7	043I	34	205I	61	356I	88	606I
8	047I	35	212I	62	364I	89	612I
9	051I	36	223I	63	365I	90	624I
10	053I	37	225I	64	371I	91	627I
11	054I	38	226I	65	411I	92	631I
12	065I	39	243I	66	412I	93	632I
13	071I	40	244I	67	413I	94	645I
14	072I	41	245I	68	423I	95	654I
15	073I	42	246I	69	431I	96	662I
16	074I	43	251I	70	432I	97	664I
17	114I	44	252I	71	445I	98	703I
18	115I	45	255I	72	446I	99	712I
19	116I	46	261I	73	452I	100	723I
20	122I	47	263I	74	454I	101	731I
21	125I	48	265I	75	455I	102	732I
22	131I	49	266I	76	462I	103	734I

23	132I	50	271I	77	464I	104	743I
24	134I	51	274I	78	465I	105	754I
25	143I	52	306I	79	466I		
26	145I	53	311I	80	503I		
27	152I	54	315I	81	506I		



AI Out Noise, Sync In Clarity.