▶ Table of Contents◀

1. Introduction

IS100 has a compact size with a various features in the range of 136~174MHz. IS100 Has a various features shown as below.

IS100 constructed with a microprocessor controlled, temperature compensated Phase Locked Loop(PLL) frequency synthesizer. The radio features a double conversion receiver and a direct FM transmitter modulator. A special integrated circuit provides support to sub-audible signaling(CTCSS & DCS) and most of the receiving parts are switched off periodically in the power save mode to reduce battery current drain during standby.

2. Description of Unit

	Items	Model
Supplied Package	Radio	IS100
	Antenna	IA-156
	1700mAh Li-Ion battery pack	BL 1700
	Desktop rapid charter	IC-170
	Adaptor	
	User manual	

	Items	Model
Accessories	External / Speaker Microphone	ES-1
	Earpiece Microphone	EP-1
	Earpiece VOX Microphone	EV-1
	VOX & PTT Headset	VP-1

3. Technical Specifications

3-1 General

1) Frequency range : 136~174 MHz
2) Channels : 255 Channels
3) Channel spacing : 12.5 kHz/25 kHz
4) Communication method : Simplex
5) Antenna Impedance : 50 ohm
6) Antenna : Helical Antenna
7) Power supply voltage : LI-1700mAh Li-Ion battery pack(Voltage: 7.4V DC)
8) Current Drain : When Transmitting(5W) - < 2A
   When Receiving(0.5W) - < 300mA
   Transmit standby - < 60mA
   Receiver standby(PSC MODE) - < 50mA
9) Microphone : Internal Condenser Microphone(External Speaker Micro phone is available)
10) Operating temperature range: -30℃ +60℃
11) Size : 56(W)x100(H)x34(D)
12) Weight : 285g

3-2 Transmitter

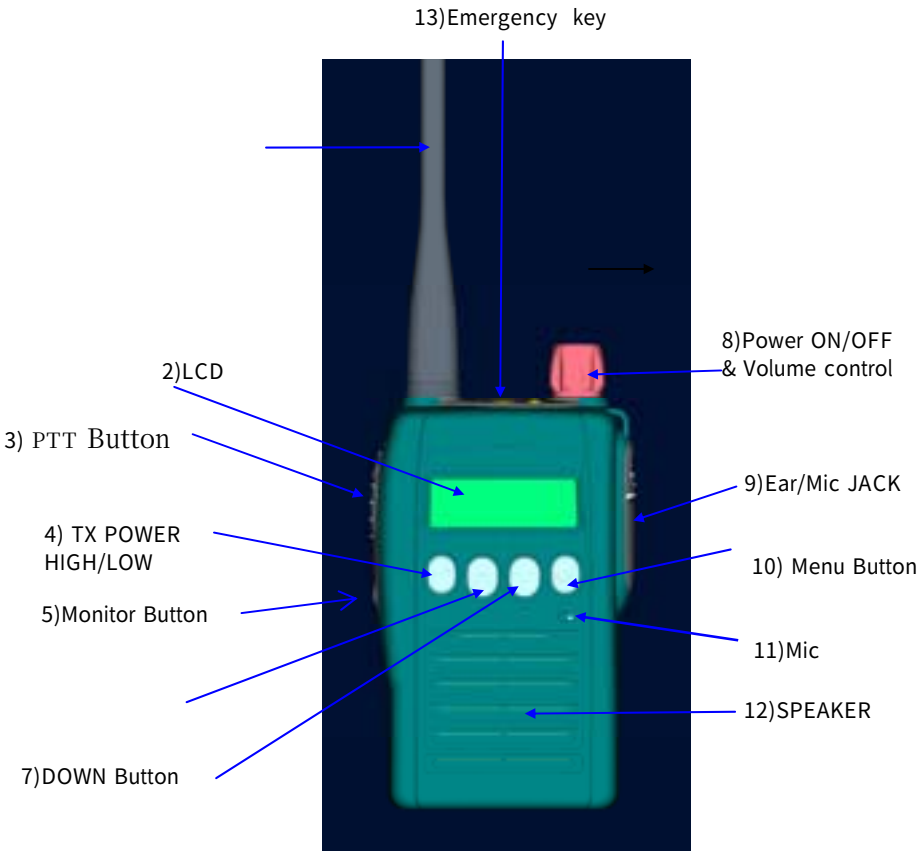
1) Power Output : HIGH – 5W, LOW - 1W
2) Modulation : 8K5OF3E/16KOF3E
3) Oscillator method : PLL
4) Frequency Stability : less than ±0.00025% (±2.5PPM)
5) Maximum frequency deviation: ±2.5 kHz(Narrow)/ ±5 kHz(Wide)
6) Audio Distortion : less than 5% (1 kHz 60%)
7) SPURIOUS Emission : -65 [dBc]
8) FM Hum & Noise : -40 [dB] (HP8920A 300Hz 3kHz BPF)
9) BAND SPREAD : 38 [MHz]

3-3 Receiver

1)	Receiver Type	:	Double Super Hetero type
2)	Sensitivity	:	-0.25uV 이하(12dB SINAD 시)
3)	Frequency Stability	:	±0.00025%(±2.5PPM)
4)	SPURIOUS Rejection	:	-60 dB
5)	Adjacent Channel Selectivity:		-60 dB (Narrow) , -70 dB (Wide)
6)	Distortion	:	5% (1 kHz 60%)
7)	Hum & Noise	:	-40 dB(HP8920A 300Hz 3kHz BPF)
8)	Audio output	:	1000 mW
9)	BAND SPREAD	:	38MHz
10)	Speaker size	:	45 pi

4. Theory of Operation

EXTERNAL VIEW



4-1 Features & Operation

1. Monitor

   Press the Monitor key momentarily to disable the Tone squelch.

2. Radio Call

   By using Various 5Tone, individual / Group call is available.

   16 Receiving codes are available as well as open call.

3. Missed calls list

   16 Missed calls can be listed. If a call remains unanswered, the call will be stored by the radio.

4. contact list

   During a call, the contact list may be used to give access to up to 16 preprogrammed numbers accessed via the menu.

5. status list

   A status is a code for transmitting prearranged messages, e.g. status “05” may indicate “launch”. Status list contains up to 30 entries.

6. Channel : 255 channel
7. Scan ON/off
8. Power level : Power level is adjustable in each channel respectively.
9. Talkaround on/off
10. Emergency :
11. Lone Worker
12. Tx Tone select : In the menu, tx dcs /ctcss tone is adjustable.
13. Rx Tone select : In the menu, rx dcs /ctcss tone is adjustable.
14. Group : Defines group tone. You can select tone code for group, and it is used as a default value
    . 0~9 and a, b, c, d available. And “A” is used as a basic value..
15. BEEP ON/OFF : BEEP sound ON/OFF.
16. KEY LOCK : LOCK/UNLOCK Button KEY.
17. SQUELCH : Squelch level is adjustable
18. AUTO SQUELCH : Squelch level is adjustable automatically by surroundings.
19. DTMF ON/OFF : DTMF function is available.
20. VOX : VOX LEVEL is adjustable by pushing up and down button.
21. AUTO VOX : VOX level is adjustable automatically by surroundings.
22. P - SCAN : Priority Scan
23. POWER SAVE : Power save mode is available.
24. PASS WORD : This function is useful for security reason.
25. LOCATION INDICATE : Indicate where the radio is located by blinking green light every 7 seconds.
26. SCRMABLE : Internal Voice Scrambler is available.
27. STUN / UNSTUN : For added security and to avoid abuse of the radio system in which you operate a feature known as Stun/Unstun is included in your radio.
28. BACKLIGHT : Lamp is lighting when you check LCD status.

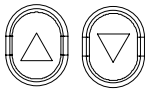
4-2 LCD Display and Icons

1.ANT GAZE ; Shows the received signal strength.
2.TX POWER HIGH: Indicate power level
3.KEY LOCK: Appears during key lock function is ON.
4.ALART(BEEP) ON/OFF: Appears when beep sound is turned ON.
5.Battery level indicator: Indicates reaming battery power.
6.VOX ON/OFF: Appears when VOX function is turned On.
7.SCAN: Appears when Scan function is activated.
8.SCRAMBLE: Appears while the voice scrambler function is activated.
9.TALK AROUND Indicator.

4-3 Features

1. Channel

This radio offers up to 255 channels

1). By using  button, you can select the desired channel.

2. Missed calls list

Up to 16 calls can be stored. If the same radio calls more than once, only the most recent call is stored. When fifteen calls have been stored by the radio, depending on the radio programming the sixteenth call received may overwrite the first or not be stored by the radio.

1).  to enter Menu Mode.

2) Display shows

3)  to select

4)  or  to scroll list

5)  to exit

3. Contact list

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to scroll list

5)  to exit

4. Status call list

4-1. Making STATUS call

1)  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to scroll list

5) Push PTT KEY for sending message on the LCD.

4-2 Make STATUS Message

1)  to enter Menu Mode.

2)  or  to until 

3)  to select

4) or to scroll list

5) to SELECT

5. Lone work

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select ON/OFF

6. Tx power

.

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select HIGH / LOW POWER

5) to select

7. Tx Tone

Selecting Transmitting TONE(CTCSS/DCS).

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to Select TONE을 either CTCSS or DCS.

0= NON TONE

1-38 CTCSS

101 – 183 DCS TONE

5) to select exit

8. Rx Tone

Changing Receiving TONE(CTCSS/DCS).

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select TONE either CTCSS or DCS.

0= NON TONE

1-38 CTCSS

101 – 183 DCS TONE.

5) to select exit

9. Group

Changing GROUP Tone.

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select scroll list

5) to select exit

10. Beep on/off

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select on off .

5) to select

11. Key lock

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select key lock /unlock.

5) to select

12. Squelch level

16 level is available. 0 = terminate sq function

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to the scroll list

5) to select exit

13. Auto Squelch

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select on /off .

5) to select

14. Scan

1). to enter Menu Mode.

2) or to until 

3) to scan.

4) Push PTT for exit

15. DTMF

1). to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to select ON /OFF.

5)  to select

16. Vox on/off

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to select ON /OFF.

5)  to select

17. Vox Level

16 level is available..

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to scroll list

5)  to select for exit

18. Auto Vox

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select ON /OFF.

5) to select

19. Priority Scan

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select ON /OFF.

5) to select

20. Priority scan CH

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to scroll list

5) to select for exit

21. Power save

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select ON /OFF.

5) to select

22. Talkaround

1). to enter Menu Mode.

2) or to until 

3) to select

4) or to select ON /OFF.

5) to select

23. Password

1). to enter Menu Mode.

2) or to until 

3)  to select

4)  or  to select ON /OFF.

5)  to select

24. Password CH

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4) ---- will display on the LCD(enter old password)

 or  by pushing up and down KEY to change password.

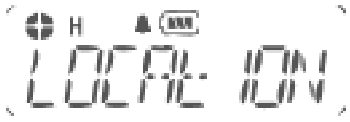
 by pushing enter KEY to change digit of password.

5) Enter new password by 4 digit.

25. Location

Indicate where the radio is located by blinking green light every 7 seconds.

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to select ON /OFF.

5)  to select

26. Scramble

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to select ON /OFF.

5)  to select

27. Status call Send

1).  to enter Menu Mode.

2)  or  to until 

3)  to select

4)  or  to select ON /OFF.

5)  to select

5. Circuit Description.

5-1 Transmitter

1) MIC AMP Circuit

Voice signal from the microphone are applied to microphone amplifier U303. U303 contains a low-pass filter that has a 6dB/oct response between 300Hz and 3kHz and eliminate above 3kHz. The pre-emphasized audio signal is applied to VR302 to adjust maximum frequency deviation.

2) VCO circuit

The transmit frequency is directly generated by the Colpitts oscillation circuit contains Q402,Q403.

3) POWER AMP

Signals from Q202, Q206 is supplied through antenna switch Q203,Q204 to a low-pass filter made up and then applied to Antenna Jack.

5-2 Receiver

1) LOWPASS FILTER and Antenna switching circuit.

Signals from antenna connector fed to the antenna switching circuit through the low pass filter consisting of L212~214. In receiving mode, D204, D202 is turned off, isolates the antenna from the transmitter circuit and matching circuitry, so that the incoming signals are fed to the RF amplifier through L211.

2) RF AMP Circuit

The signals from the switching circuit are fed to the RF amplifier Q101 through a band pass filter made up of molded coil, vvc diode and capacitor.

3) MIXER Circuit

The amplified signals are fed to Gate 1 of the first mixer Q102. First local oscillator signal is supplied to Gate 2 of Q102 from the PLL circuit to convert the RF signals into 21.4MHz first IF signal.

4) IF Circuit

The first signals from Q102 are fed to the matched pair crystal filter FL101, then IF signals are amplified in Q103. And those signals are fed to U101 which is composed of the second local oscillator, second local oscillator, second mixer, limiter amplifier, quadrature detector and active filter circuit. The second local oscillator at 20.945MHz with X 101 and is fed to the second mixer with the first IF signals to convert into 455kHz second IF signals.

5) Audio and squelch Circuit

The detected audio signals are put through a 6dB/oct de-emphasis circuit made up of Q602.

The signal is then applied to audio power amplifier U603 to obtain enough power to driver the speaker.

Part of the recovered noise signal is fed to the integrated operational amplifier inside U101 which makes up an low pass filter. The sensitivity of squelch is adjusted by VR 101.

5-3 VCO Circuit

The transmit / receive frequency is directly generated by the Colpitts oscillation circuit contains Q402, Q405