

User Manual

UHF Transceiver

XP-400D



YeonHwa M Tech Co.,Ltd

Version #1 (2016-12-15)

36 Jeonpa-Ro, 44Beon-Gil, Manan-Gu, Anyang-City, Gyeongg-Do, Korea

Tel: 82-31-444-7270

1. XP-400D Series Main Features

The XP-400D Digital Radio was developed by YeonHwa M Tech Co.,Ltd to be user-friendly and compact design, to have various features and to use at the construction / industrial / commercial / public areas for the safety & convenience of users.

It provides better communication distance, audio quality and volume, duration of use through digitalization than Analog radio.

The followings are the main features of the XP-400D Series Radio.

- 16 Zones and 32 Channels are selectable. (1zone = Max 32 Channels)
- 512 CH can be set.
- English and China setting function.
- RF Power setting function.
- Short (up to 40 characters) message sending and reception functions.
- Encryption mode 16 bit (encryption key Range 0~65535)
- Lone Worker mode
- Normal scan
- 5-step VOX (Voice Operated Transmit) can be set
- BCL / BCLO function
- Time-Out Timer (TOT) function
- Emergency / Siren function
- Built in Flash Lamp
- Etiquette (Vibration) function
- Voice recording and playback(Recorder quantity : 63, 1 Recorder : 2minute 30second)
- Automatic analog/digital mode detection in receiver mode
- 5-step S.Q can be set (Analog Analog support).
- Remote Radio Stun / Kill / Revive
- Speaker volume of 1 Watt
- Use of Motorola accessories and a shared
- 3Lines Mono LCD Display
- Aluminum metal Frame Body
- Adopt DC+7.5 V 2,600mAH high capacity Battery

2. Specification

2.1 XP-400D

General

Frequency Range	410 ~ 470 MHz
Frequency Stability	±1ppm (-30 to +60°C)
Programmable Channels	16 Zones / 32 Channels
Channel Spacing	12.5KHz
Digital Vocoder	AMBE++
Dimensions	99mm(H) x 51mm(W) x 21mm(D)
Weight	250g
Power Source	DC +7.5V Li-ion 2,600mAH Battery
Current Drain (maximum)	Receive mode, rated audio out – 320 (Audio Max) Transmit mode – 1,800mA Standby mode – 120mA

Receiver

Sensitivity	0.25uV 12 dB SINAD
Squelch Sensitivity	0.22uV 10dB SINAD
Selectivity	65dB (12.5KHz)
Spurious and Harmonic Rejection	70dB
FM Hum and Noise	40dB (12.5KHz)
Audio Output Power	1 Watt across an 16-ohm load
Audio Distortion	Less than 3% at rated output
Audio Response	+1, -3 dB from 6dB per octave de-emphasis Characteristic from 300 ~ 3000Hz
Input Impedance	50 ohms

Transmitter

RF Power Output	4.8Watt
Spurious and Harmonic	70dB
FM Hum and Noise	40dB (12.5KHz)
Audio Distortion	3% maximum with 1KHz modulation
Audio Frequency Response	+1, -3dB from 6dB per octave pre-emphasis Characteristic from 300 ~ 3000Hz
Output Impedance	50ohms
Duty Cycle	50 % (Digital) 75 % (VOX)

3. Checking items in the package

- Components could be changed by buyer request.



Radio unit



Battery



1 slot charger



Antenna



Belt clip



Hand strap(option)



User manual

Figure 3-1) XP-400D series main items

XP-400D

XP-450D

XC-100 : Single Slot Desktop Charger

XC-200 : Dual Slot Desktop Charger

XL-260 : 2,600mAH Li-ion battery pack

CP-818X : Ear Speaker

3.1 Appearance of XP-400D Series Radio

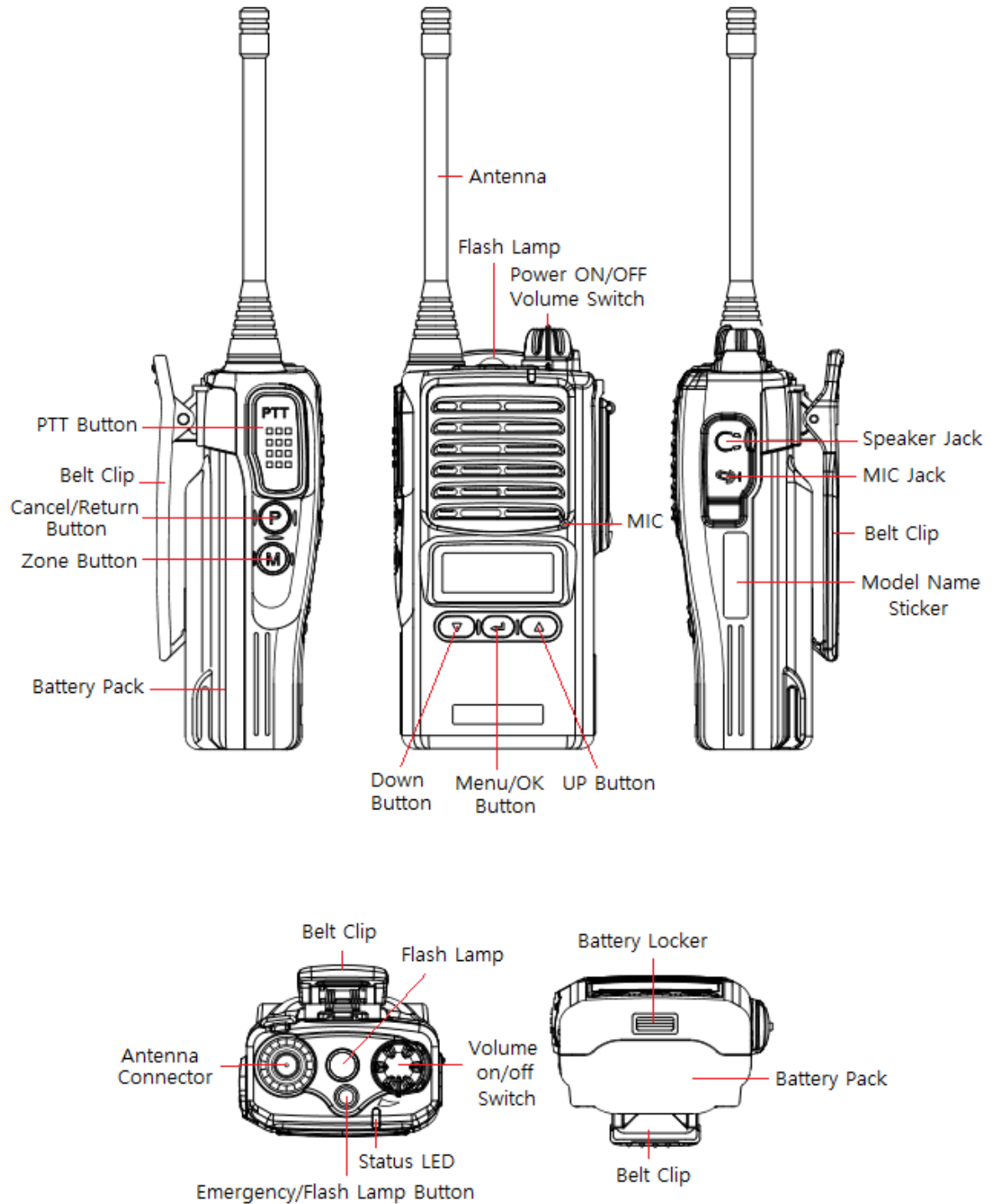


Figure 3-2) Appearance of XP-400D Series Radio

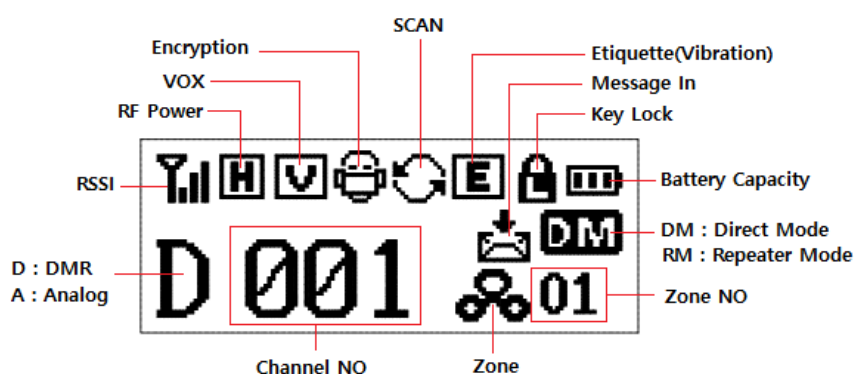


Figure 3-3) LCD Indication of XP-400D Series Radio

4.1 Basic Button Operations

Button	Operation Description
PTT Button	Pressing PTT button, the radio mode is transmission and releasing the button, it is receiving mode. It is recommended to talk 5~10cm away from the microphone for the best voice communication.
Power ON/OFF Volume Switch	Turning the volume switch knob clockwise to power on and turning the knob counterclockwise to power off. And when set an audio volume level, please refer with the index on the side of the volume knob.
Up/Down Button	You can change the settings of the Channel that have been set. You can enter 32 Channel per the call zone (Zone). In the progress of the menu, you can move the menu item.
Zone Button	You can change the order of the call zone that you set.
Menu/OK Button	The button to enter the menu. When you enter the menu, you can make a choice of each item.
Cancel/Return Button	Using the Button, it will return to the menu on the one stage. In the menu setting screen, and run the cancellation of the function.
Emergency Flash Lamp Button	If you press the button shortly, it will operate with the function set by the YEONHWA M TECH CO.,LTD program, and the default value is set to Emergency. . Press the button long, it is to activate the flash lamp on / off button.

4. Basic operation

Please fully read the instruction manual before use.

This manual provides important information related to radio operation.

4.1 Installation and Removing the Antenna

To install the antenna, insert the antenna into antenna connector and screw the antenna clockwise.

To remove the antenna, screw the antenna counter clockwise.

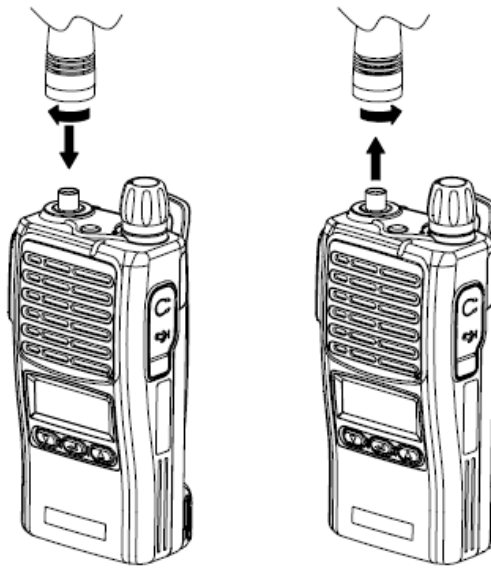


Figure 4-1) Installation and Removing the Antenna

 Caution	When installation of the antenna, giving a strong pressure to the Radio or pulling the antenna with a strong power from the Radio can make a damage on the antenna connector, which may cause the Radio to have a critical problem.
--	---

4.2 Installation and Removing the Battery

4.2.1 Installation of the battery

To install battery, slide up the battery towards the top of the radio until battery latch is locked.

4.2.2 Removing the Battery

- Slide the battery latch located on the bottom of radio to the open position as shown in Figure 4-2.
- The battery is removed by pressing it against and sliding it towards the bottom of the radio

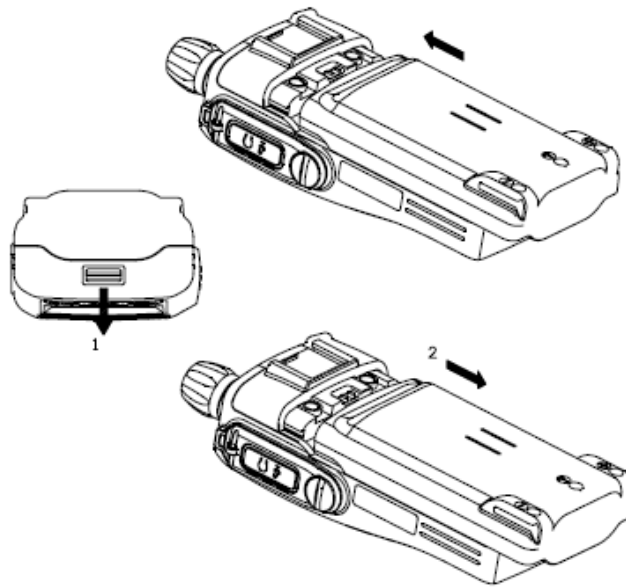


Figure 4-2) Installation and Removing the Battery

4.3 Installation and Removing the Belt Clip

- To attach belt clip to radio, align belt clip rails with the grooves in radio and slide the belt clip onto the mounting rails until it latches into place.
- To remove belt clip from radio, push up on tab of belt clip with flat bladed screw driver and at the same time, slide the belt clip towards the top of Radio figure4-3).

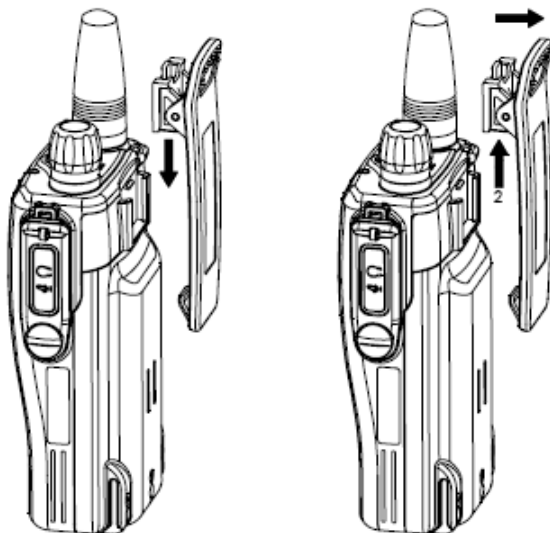


Figure 4-3) Installation and Removing the Belt Clip

4.4 Accessory connector

Accessory connector is used to connect external speaker MIC, and headset, etc.
Please close the cover when nothing is connected.

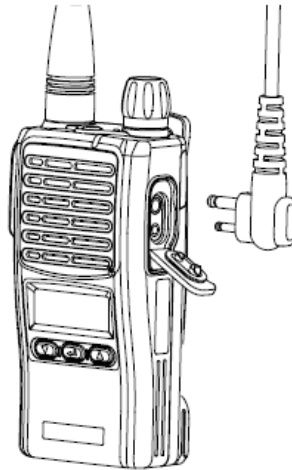


Figure 4-4) Accessory connector

5. Radio operation

The definition of the various buttons of the XP-400D series is the same as Figure 5-1).

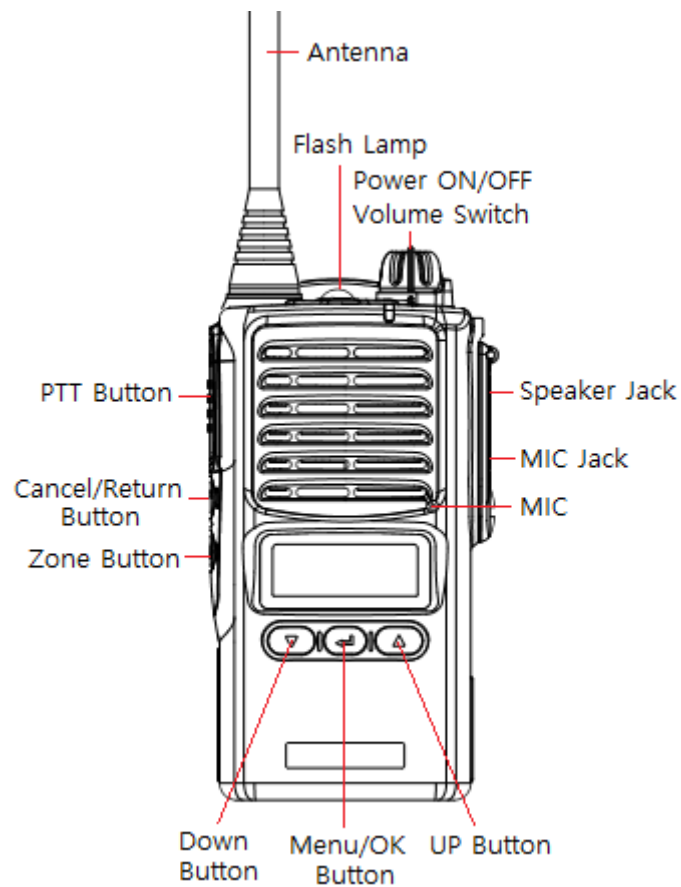


Figure 5-1) XP-400D Series button definition

5.1 Power ON/OFF, Volume Switch

Turning the volume switch knob clockwise to power on and turning the knob counterclockwise to power off. And when set an audio volume level, please refer with the index on the side of the volume knob.

5.2 PTT Button

Pressing PTT button, the radio mode is transmission and releasing the button, it is receiving mode. It is recommended to talk 5~10cm away from the microphone for the best voice communication.

5.3 ZONE Button (Program settings)

When you press the ZONE button, the registered ZONE which registered by program is changed to a step-by-step and can be select your request channel use by UP / DOWN buttons.

5.4 MENU/OK Button

When you press the MENU / ENTER button, currently programmed menu is displayed and you can select a desired menu using by VOLUME + / LEFT button or VOLUME- / RIGHT button.

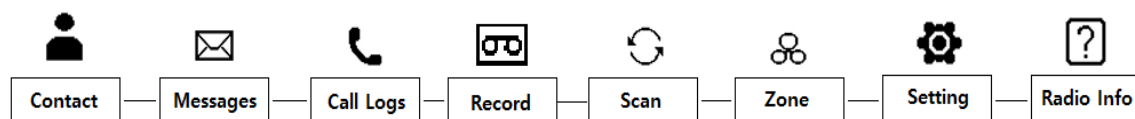


Figure 5-2) XP-400D Series Menu

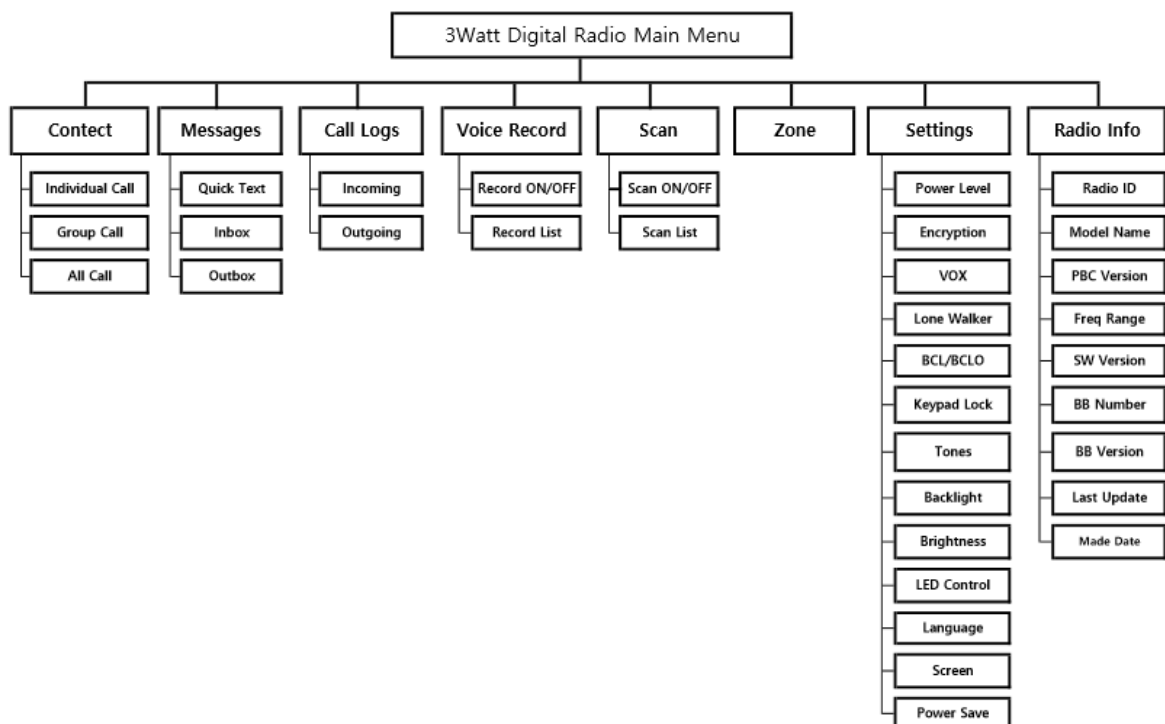


Figure 5-3) XP-400D Series Menu Tree

5.5 CH/Menu UP/Down Button

"CH / MENU UP" and "CH / MENU Down" are to change channels and in the menu entry mode, it is select the UP / Down of the Menu.

5.6 EAR/MIC Jack

Accessory connector is used to connect external speaker Mic, and headset, etc.

Please close the cover when nothing is connected.

6. Charging the Battery

6.1 Safety Notes

- 1) The radio of XP-400D series receives power from high-performance Li-ion battery (XL-260). XL-260 Battery is safe of high performance and highly reliable, and could be charged very fast.

 Caution	The charging of the enclosed Radio on the other maker's charger will cause damage on the battery and also, will cause a trouble on the Radio.
--	---

- 2) Please charge the battery before using the radio for best performance and safety.
- 3) When you charge the battery that is installed in the Radio, please turn off the radio first to charge the battery.

 Caution	The continuous rapid discharge (for example, when making a short circuit on the '+' terminal of battery by a metal substance) may make a fatal defect and the battery can be exploded. Also, it can cause a fire.
--	---

6.2 Charging time

Low battery voltage maybe cause to reduce communication coverage and also make the performance worse. Please charge the battery in case of following:

- 1) When you think that the performance of the radio has degradation.
- 2) The red lamp on RX/TX LED blinks. (every 0.5 second), during transmission or reception.
- 3) When the battery icon is blinks
- 4) While the radio is in use, "beep" sounds.



Figure 6-1) Battery charging

6.3 How to charge

- 1) Plug the adapter of the TAD-800L charger in general power AC220V power outlet.
- 2) When charging the battery that is equipped with radio, please turn off the power of the Radio and plug the Radio in the charger.
- 3) Even if charging is completed (green lamp lights), please charge more for about 30 minutes for a full charge.

Status	LED indication	Status	LED indication
Charging	Red LED lights	Detecting error	Red LED is flicker
Complete charging	Green LED lights	Keep charging	Green LED lights

6.4 Charger (XC-100/XC-200)

The XC-100/XC-200 charger is designed to charge only the Li-ion battery enclosed in this Radio.
 Adaptor input voltage: AC85~250V



Figure 7-2) XC-100 & XC-200

XC-100/200 Specification

Description	XC-100	XC-200
Input voltage	DC+12V	DC+12V
Slot	1	2
Battery	XB-2400	XB-2400
Quick charging time	In 5 hours and half	In 5 hours and half
Operation temperature	-20°C~+40°C	-20°C~+40°C
Dimension	70(W)x58(D)x36(H)m/m	70(W)x104(D)x36(H)m/m
Charging current	870mA(Rapid charging)	870mA(Rapid charging)

7. Using the XP-400D Series

7.1 Menu description

Press the Menu/OK button on the front to enter the menu mode. In the menu mode, there are eight of the main menus, and set and used according to the application and the environment, it can be more convenient to use.

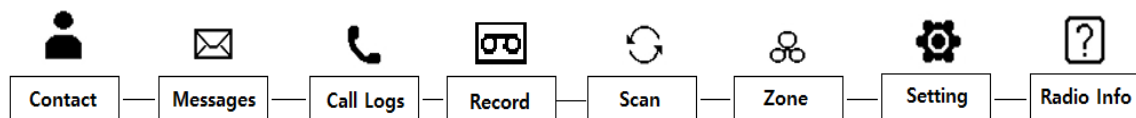


Figure 7-1) XP-400D Menu

Note) If the menu is not operated for at least 25 seconds after launch, the menu mode is automatically end and it is switch to receive mode.

7.1.1 Contact List

Set a contact list (set to CPS program) and will be pressing the PTT button to call. If you want to call with another registered contact, after you select a contact from the contact list and press the PTT button, it will be the call. The list of contacts in the menus can be registered / deleted using the CPS(Customer Programing Software) program.

When you enter in the contact menu, the individual, group and All Call contact list is displayed.

- ICON

-  : Individual Contact List (individual Call , Sending individual message)
-  : Group Contact List (Group Call , Sending group message)
-  : All Contact List (All call, Sending Message to terminal which has same channel and same color)

7.1.2 Message

When a new message arrives, the contents will be display on LCD in receive mode.

And if you are in other mode, it will be seen in the ICON form when a new message arrives.

Message menu has a simple message, inbox, outbox, three kinds of menu.

1) Simple Message

Using the CPS program can create a total of 10 messages and

One message can be edit up to 40 characters.

If you select a simple message menu you can view the registered message.

Select the message you want to send, and press the Menu/OK button, you can see the contents of the message. When you press the Menu/OK button again, the message will be sent to the registered terminal.

2) Inbox

It is possible to store up to 10 incoming messages.

When you choose contents stored in the list, you can see the received messages.

When the received message is more than 10, the earliest incoming message is cleared first and it is registered.

If you want to delete incoming messages, it can be deleted by selecting delete all menu.

3) Outbox

It is possible to store up to 10 outgoing messages.

When you choose contents stored in the list, you can see the outgoing messages.

When the outgoing message is more than 10, the earliest outgoing message is cleared first and it is registered.

If you want to delete outgoing messages, it can be deleted by selecting delete all menu

7.1.3 Call Log

This is the menu to save only individual call log.

Group and All call logs do not save. The message content is managed in the in/outbox messages.

1) Inbox

It is possible to store up to 10 inbox record and it can see the opponent ID.

When the inbox is more than 10, the earliest inbox record is cleared first and it is registered.

If you want to delete inbox record it can be deleted by selecting delete all menu.

2) Outbox

It is possible to store up to 10 outbox record and it can see the opponent ID.

When outbox is more than 10, the earliest outbox record is cleared first and it is registered.

If you want to delete outbox record it can be deleted by selecting delete all menu.

7.1.4 Call Recording

This function is used to save the outgoing and incoming calls content. If the recorded content is not required, it can be completely deleted.

Calls list can store up to 63 and one call list will be limited to 2 minutes and 30 seconds.

If you want to use the call recording function, you can select in the settings.

 Caution	. In the encrypt feature, only the contents that have been encrypted calls can hear the normal recording contents but content that has not been encrypted calls will not be able to hear.
--	--

7.1.5 Scan

When turning ON the scan operation, to start the scan in the order of the channel that has been set in the scan list. If there is a channel used during the scan, you will receive the contents stops at that channel.

If you want to call, you can use the settings to suit your needs by the CPS program.

1) Scan ON/OFF

Select the scan settings or scan release at the scan of menu and go to receive mode..

2) Scan list

Scan list can be set using the CPS program.

7.1.6 ZONE

ZONE can create up to 16 and it can be registered to 32 channels per ZONE.

How to specify the ZONE is to use the CPS program.

7.1.7 Setting

This is the menu to set various functions of the radio.

The settings are transmission power, voice encryption, VOX, Lone walker, BCL / BLCO, Keypad lock, Sounds, Backlight, Contrast, LED settings, and Language.

1. Transmission power

Set the high and low of the transmission power.

2. Voice Encryption

This is a feature to encrypt the incoming and outgoing voice. Voice Encryption function can be set for each channel from all of the digital channels.

The setting of voice encryption code is using the CPS program, the total number of encryption can be set from 0 to 65535.

3. VOX

VOX function is transmitted by detecting a voice level without using the PTT button

VOX sensitivity level is 1 - 5 steps, you can set using the CPS program.

4. Lone walker

It is function to inform others about your safety within the time set in the menu.

Setting time supports up to 1-100 minutes..

5. BCL/BCLO

If the another user on the currently used channel, it is the ability to limit the transmission so as not to interfere..

BCL: If the current channel is busy, the transmission prohibition

BCLO: The ability to send regardless of the user of the current channel

6. Button Lock

With the exception of the minimum of buttons necessary for the user to prevent unwanted terminal operation, it is the ability to limit the operation.

When the button lock is on, all buttons are locked except the PTT button, the emergency button and power ON / OFF button.

7. Tones

This is a Tone setting function. The main menu is available only ON / OFF.

The detailed sound can be set using the CPS program.

8. LCD BACKLIGHT

This feature is LCD backlight ON / OFF.

9. LCD Brightness

The function is to adjust the brightness. The brightness can be set from 1 to 7 step.

10. LED Control.

The feature is to set the LED status display. It can be set detailed using the CPS program.

11. Language

The feature is to select the language for the menus.

12. Screen

Screen consists of ① Screen1 ② Screen2.

13. Power Save

Power save consists of 4 steps: ① OFF ② 1: 1 ③ 1: 2 ④ 1: 4.

7.1.8 Radio Information

A menu that shows the information in this device..

8. Precautions

8.1 Matters affecting the performance of the equipment.

 WARNING	Don't remove the antenna from the Radio or don't transform the antenna or don't make any change on the antenna. The strong electronic wave to be emitted from the Radio can have an effect on the performance of the Radio and can cause the Radio to have a defect.
--	--

 Caution	Don't use the accessories (such as rechargeable battery, adaptor, external speaker microphone and earphone, etc.) from the other makers, which can cause to make a defect on battery and a malfunction or a defect on the Radio.
--	--

 WARNING	Don't disassemble or reorganize the Radio. The disassembly or reorganization will be causes of defect or malfunction and it will be impossible to make repair afterward. Also, a punishment can be made by law.
--	---

 WARNING	Don't use the other frequency except for the permitted frequency in order not to be punished by law.
--	--

 Caution	• Don't give an excessive shock to the Radio. • Don't place the Radio where the direct sunlight and/or the high temperature occurs. • If the Radio is placed for a long time in car in summer, the hot temperature in the car may cause an explosion of battery. • Don't make a damage to the battery by a sharp substance and/or an excessive shock.
--	---

9.2 Influences to the operations of Radio or other Equipments.

The Radio emits a strong electronic wave, which may have an effect on the operation of other equipments and also, can be influenced by the other devices.

 WARNING	Please turn off the Radio before boarding on airplane. When you want to use the Radio in the airplane, please follow the rules in the airplane or the instructions by crew.
--	--

	In case of the area that medical equipments are being used, please use the Radio after discussion with the equipment maker or the related doctor.
---	--

	Please don't use the Radio at the place where computer or the other electric/electronic devices are being used, because the strong electronic wave from the Radio can have an effect on the equipments.
---	--

10. Safety Notes

Please make sure to read the followings for safe and effective use of the Radio.

	• Please keep the Radio away at least 1inch from the body. • If the outside surface of antenna gets stripped out, it can make a burn on the skin. • If you contact a conductive metal to battery terminal, a heat can be made and it may cause fire, explosion and burn. Especially, please be careful when putting the battery in a pocket or a bag. • When using an earphone, please don't listen to the sound at a high level. The high sound may have a bad effect on your ear. • After setting the volume of the Radio at a low level, please adjust the volume step by step to the level you want. A sudden high sound may give a bad damage to the ear or the heart. • Please don't remove or replace or charge or discharge the battery at a dangerous area, since it may cause an explosion or a fire by an electrical spark. • At the area where an electromagnetic force can be made, please make sure to turn off the power of the Radio.
---	---

10.1 Important Safety Information

- Before using the radio, read the RF Energy Exposure and Product Safety Guide for Portable Two-Way Radios which contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable standards and Regulations.
For a list of YEONHWA M TECH-approved antennas, batteries, visit the following website:
<http://www.xradio.co.kr/>
Any modification to this device, not expressly authorized by YEONHWA M TECH, may void the user's authority to operate this device.
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.
This radio transmitter has been approved by Industry Canada to operate with YEONHWA M TECH-approved antenna with the maximum permissible gain and required antenna impedance for each antenna type indicated.
Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

	Date	2014. 10. 04	Version No.	1.0
	Subject	HS10-YH455-WSM		

Antenna Specification

1.1. General Standard

General specification	
Model name	HS10-YH455-WSM
Antenna type	WHIP Antenna

1.2. Electrical Standard

Electrical specification	
Frequency range	455.0MHz
V.S.W.R	1.9 : 1 Max.
Gain(dBi)	1±0.5
Radiation pattern	Omni-directional
Polarization	Vertical
Max Power(W)	5W Max.
Impedance	50Ω Normalizer

1.3. Mechanical Standard

Mechanical specification	
Connector type	SMA Male
Cover material	Keyflex
Color	Black
Temperature range	-30℃ ~ 70℃
Weight	12 ± 2g
Dimension	TBD

Warranty Card

Thank you for purchasing XP-400D Series.

1. This product has passed strict quality control and testing process.
2. Warranty is one year from the day the factory.
 - Failure of the product under normal operating conditions, during the warranty period may be repaired by YeonHwa M Tech Co.,Ltd or our authorized service organization free of charge.
3. For the following cases, some service fees will be charged.
 - It occurs after the warranty period has passed, performance failure, malfunction or damage.
 - When the product is damaged due to user's mishandling, abuse or improper operation.
 - When the product is damaged due to user's modification, attempted repair or otherwise access to sealed/non-user serviceable items.
 - When the product is damaged due to fires, pollution, earthquakes and any other natural or unnatural conditions, accidents, etc.
4. Product check list

Model No.		XP-400D
Serial No.		
Purchase date		
Purchaser	Name	
	Address	

※ When you purchasing, please fill out this check list.

YeonHwa M Tech Co.,Ltd

36 Jeonpa-Ro, 44Beon-Gil, Manan-Gu, Anyang-City, Gyeongg-Do, Korea

Tel: 82-31-444-7270