



DIGITAL PORTABLE RADIO
PD502i UL913 OWNER'S MANUAL

Welcome to the world of Hytera and thank you for purchasing this product. This manual includes a description of the functions and step-by-step procedures for use. It also includes a troubleshooting guide. To avoid bodily injury or property loss caused by incorrect operation, please carefully read the *Safety Information Booklet* before use.

This manual is applicable to the following product:

PD502i UL913 Digital Portable Radio

DIGITAL PORTABLE RADIO



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FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Verification of harmful interference by this equipment to radio or television reception can be determined by turning it off and then 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 different circuit to that of the receiver's outlet.
- Consult the dealer or an experienced radio/TV technician for help.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Note: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Compliance with RF Exposure Standards

The radio complies with the following RF energy exposure standards and guidelines:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR § 1.1307, 1.1310 and 2.1093
- American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE) C95. 1:2005; Canada RSS102 Issue 5 March 2015
- Institute of Electrical and Electronic Engineers (IEEE) C95.1:2005 Edition

RF Exposure Compliance and Control Guidelines and Operating Instructions

To control your exposure and ensure compliance with the occupational/controlled environmental exposure limits, always adhere to the following procedures.

Guidelines:

- Do not remove the RF Exposure Label from the device.
- User awareness instructions should accompany device when transferred to other users.
- Do not use this device if the operational requirements described herein are not met.

Operating Instructions:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), press the **Push-to-Talk (PTT)** key. To receive calls, release the **PTT** key. Transmitting 50% of the time, or less, is important because the radio generates measurable RF energy only when transmitting (in terms of measuring for standards compliance).
- Keep the radio unit at least 2.5 cm away from the face. Keeping the radio at the proper distance is important as RF exposure decreases with distance from the antenna. The antenna should be kept away from the face and eyes.
- When worn on the body, always place the radio in an approved holder, holster, case, or body harness or by use of the correct clip for this product. Use of non-approved accessories may result in exposure levels

which exceed the FCC's occupational/controlled environmental RF exposure limits.

- Use of non-approved antennas, batteries, and accessories causes the radio to exceed the FCC RF exposure guidelines.
- Contact your local dealer for the product's optional accessories.

IC Statement

The device has been tested and complies with SAR limits, users can obtain Canadian information on RF exposure and compliance.

Après examen de ce matériel aux conformité aux limites DAS et/ou aux limites d'intensité de champ RF, les utilisateurs peuvent sur l'exposition aux radiofréquences et la conformité and compliance d'acquérir les informations correspondantes

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique

subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

EU Regulatory Conformance

As certified by the qualified laboratory, the product is in compliance with the essential requirements and other relevant provisions of 2014/53/EU, 2012/19/EU, 2006/66/EC, and 2011/65/EU.

Please note that the above information is applicable to EU countries only.

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Intrinsically Safe Radio Information (Exi)

Product Marking

SGS

I.S Class I, II, III, Division 1, Group C, D, E, F, G, T4

NI Class I, Division 2, Group A, B, C, D

-30°C to +55°C

Certificate Number

SGSNA/17/SUW/00222

No Misoperations

Stop operating the product and leave the blasting area immediately when the intrinsic safety or integrity of the product is endangered, and deliver it to your local dealer for examination.

The safety or reliability of the product may be endangered when:

- The product is stored improperly.
- The product is faulty.
- The product works with overload.

- The product operates beyond the tolerance or threshold.
- The product is damaged during transportation.
- The product's housing is obviously damaged or cracked.
- The logo or characters on the product are hard to be recognized.

Safety Instructions

Caution

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions.

- Use only the Ex-battery BL2020-Ex specified by the Company. The use of other batteries may result in Ex-protection (intrinsic safety) failure.
- Charge the battery in a non-hazardous area only with the designated charger.
- Do not remove the battery from the radio in a hazardous area.
- Do not carry any standby battery into a hazardous area.
- Use only the Hytera-specified accessories. Do not replace the accessories in a hazardous area.
- Do not use a damaged antenna. Moving a damaged antenna towards your skin may cause a minor burn.
- Do not expose the radio to direct sunlight for a long time, nor place it close to a heating source.

- Hold the radio upright and keep its microphone 2.5 to 5 centimeters away from your mouth during use.
- If you wear a radio on your body, ensure its antenna is at least 2.5 centimeters away from your body during transmission.
- Do not attempt to repair and service the radio, batteries and its accessories. Please contact your dealer for repair and servicing.
- Do not disassemble or redo the radio. Unauthorized modification of the radio may result in termination of Ex-protection (intrinsic safety) of the radio.
- Improper usage of the product other than it is intended to be used for will impair safety of the product, yourself and surrounding environment.
- Do not carry the radio into Zone 0 and 20. Please do not use the radio out of the operating temperature range specification of this product.

Specifications

Item	Specifications
Rated Operating Voltage	DC 7.4 V
Max. Operating Voltage	DC 8.4 V
Max. Operating Current	1.7 A
Dimensions (H*W*D) (with standard battery, but without antenna)	115 x 54 x 35 mm



Item	Specifications
Weight (with standard antenna & battery)	About 298 g
Sensitivity	0.28 μ V
Rated Audio Power Output	0.5 W
Audio Distortion	\leq 3%
Operating Temperature	-30°C to +55°C
Storage Temperature	-40°C to +85°C
Charging Temperature	0°C to +40°C
Battery	Ex-battery BL2020-Ex (2000 mAh)
Charging Time	About 3.5 hours

Compliance Standards

- UL 913 5th Ed. February 21,1997
- CAN/CSA C22.2 No. 157-92 (R2012) +UPD1 +UPD2
- TIA 4950-A Revised 05/13/14

Documentation Conventions

Icon Conventions

Icon	Description
 Note	Indicates references that can further describe the related topics.
 Caution	Indicates situations that could cause data loss or equipment damage.

Notation Conventions

Item	Description	Example
Boldface	Denotes menus, tabs, parameter names, window names, dialogue names, and hardware buttons.	To save the configuration, click Apply .
		The Log Level Settings dialogue appears.
		Press the PTT key.

Item	Description	Example
" "	Denotes messages, directories, file names, folder names, and parameter values.	The screen displays "Invalid Battery!".
		Open "PDT_PSS.exe".
		Go to "D:/opt/local".
		In the Port text box, enter "22".
>	Directs you to access a multi-level menu.	Go to File > New .
<i>Italic</i>	Denotes document titles.	For details about using the DWS, refer to <i>Dispatch Workstation User Guide</i> .
Courier New	Denotes commands and their execution results.	To set the IP address, run the following command: <code>vos-cmd - m name IP</code>

Packing List

Please unpack carefully and check that you have received the following items. If any item is missing or damaged, please contact your dealer.

Item	Quantity (PCS)	Item	Quantity (PCS)
Radio	1	Antenna	1
Battery	1	Belt Clip	1
Charger	1	Strap	1
Power Adapter	1	User Manual	1

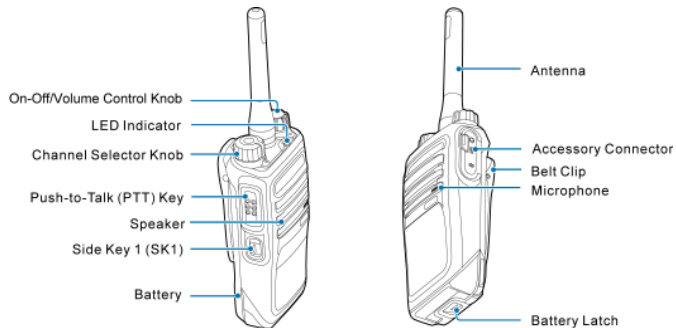


Note

Check whether the frequency band marked on the antenna label matches that on the radio label. If not, please contact your dealer.

Product Overview

Product Controls



Programmable Key

You can request your dealer to program **SK1** as a shortcut to a radio feature. Please consult your dealer for assignable radio features.

Before Use

Charging the Battery

Caution

- Read the *Safety Information Booklet* before charging.
- Use the approved charger to charge the battery.
- The remaining lithium-ion battery power is limited to 30% pursuant to the new lithium battery shipment regulation approved by International Air Transport Association (IATA).

Before initial use, fully charge the battery to ensure optimum performance.

To charge the battery, do as follows:

1. Insert the output connector of the power adapter into the port on the back of the charger.
2. Plug the power adapter into a power outlet.
3. Place the battery into the charger.

To determine the charging status, check the light-emitting diode (LED) indicator on the charger according to the following table:

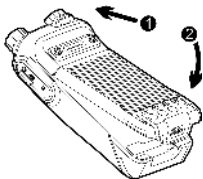
LED Indicator	Description
Glows red	The battery is charging.

LED Indicator	Description
Glows orange	The battery is charged to 90% or above.
Glows green	The battery is fully charged.
Flashes red slowly	The battery fails to make proper contact with the charger. In this case, take the battery out of the charger, and then place it into the charger for proper contact.
Flashes red rapidly	The battery fails to be charged. In this case, please contact your dealer to check whether the battery or power adapter is damaged.

Note

You can also charge the radio with battery attached. It is recommended that your radio be turned off during charging.

Attaching the Battery



Note

To remove the battery, make sure that the radio is turned off, and then slide the battery latch upwards to unlock the battery.

Attaching the Antenna

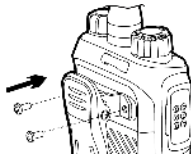


Caution

Do not hold the radio by the antenna, because it might reduce the radio performance and life span of the antenna.

Attaching the Belt Clip

1. Use a Phillips screwdriver to turn the screws counter-clockwise on the back of the radio and remove them.
2. Align the screw holes on the belt clip with those on the back of the radio.
3. Put the screws back in places as shown below, and use the screwdriver to turn them clockwise until hand tight.



Attaching the Audio Accessory

Caution

For optimal waterproof and dustproof performance, do close the accessory connector cover and fasten the screw when no accessory is attached.

1. Open the accessory connector cover.



2. Plug the accessory into the accessory connector.



3. Rotate the screw on the accessory plug clockwise until hand tight.



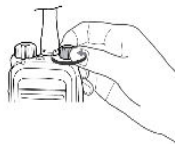
Basic Operations

Turning the Radio On or Off

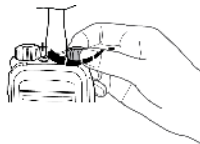
ON



OFF



Adjusting the Volume



Checking the Battery Power

To check the battery power, press and hold the preprogrammed **Battery Power Indicator** key. The following table lists the battery power indications.

LED Indicator	Alert Tone	Battery Power
Glows green	Three beeps	High
Glows orange	Two beeps	Medium
Glows red	One beep	Low
Flashes red	Low battery tone	Under the low battery threshold. Please recharge or replace the battery.

Selecting a Zone and Channel

In conventional mode, the radio receives and transmits data and voice on the selected channel. A zone is a group of channels within the same operational area.

To select a zone, press the preprogrammed **Zone Up** or **Zone Down** key.

To select a channel after selecting the required zone, do either of the following:

- Rotate the **Channel Selector** knob.
- Press the preprogrammed **Channel Up** or **Channel Down** key.

Checking LED Indications

To determine the radio status, check the LED indicator on the radio according to the following table:

LED Indicator	Radio Status
Flashes green	Being turned on.
Glows green	Receiving.
Glows red	Transmitting.
Flashes orange slowly	Scanning or roaming.
Flashes orange rapidly	Working in emergency mode.
Glows orange	Call hang time: No voice is being transmitted or received on the channel during a call. Within such a period, you can press and hold the PTT key and speak.

Call Services

When you are speaking during a call, keep the microphone about 2.5 to 5 cm away from your mouth. This ensures optimal voice quality on the receiving radio.



Call on Digital Channel

You can initiate or receive the following types of calls on a digital channel:

- **P**ivate call: a call from an individual user to another individual user.
- **G**roup call: a call from an individual user in a group to all the other members in the group.
- **A**ll call: a call from an individual user to all the other users on the current channel.

Note

The All Call feature must be authorized by your dealer.

Initiating a Call

To initiate a call, do as follows:

1. Rotate the **Channel Selector** knob to select the required channel.
2. **P**ress and hold the **PTT** key to call the private contact, group contact, or all call contact preset for the selected channel.

Receiving and Responding to a Call

When receiving a call, you can listen to it without any operation.

You can press and hold the **PTT** key and speak within call hang time.

Call on Analog Channel

On an analog channel without signaling, you can initiate a call to all the other users on the channel. On an analog channel with signaling, you can initiate a call to a specific contact on the channel.

To initiate a call on an analog channel, do as follows:

1. Rotate the **Channel Selector** knob to select the required channel.
2. Press and hold the **PTT** key, and speak into the microphone.

Supplementary Features

The supplementary features of the radio vary with the operation mode. For details, see the following table.

Feature	Digital	Analog
Mic Automatic Gain Control (AGC)	√	√
Treble Boost	√	√
LQO	√	√
Audio Feedback Suppression	√	×
One Touch Call	√	√
Scan	√	√
Roam (paid feature)	√	×
Talk Around	√	√
Time-out Timer (TOT)	√	√
VOX	√	√
Control Services	√	×
Analog Services	×	√

Feature	Digital	Analog
Personal Security Services	√	√
Encrypt	√	×
Scrambler	×	√

Audio Optimization

The features described in this section help optimize voice quality.

Turning on or off the LQO Feature

The LQO feature allows the radio to automatically adjust the volume and effect of received voice in different environments.

To turn this feature on or off, press the preprogrammed LQO key.

One Touch Call

The One Touch Call feature allows you to press the preprogrammed **One Touch Call** key to quickly access a service assigned by your dealer. The available services are as follows:

Service Type	Description
Voice Service	Analog Channel: To call a 5-tone or 2-tone contact.

Service Type	Description
	<p>Digital Channel:</p> <ul style="list-style-type: none"> ● To initiate a group or private call. ● To perform the following services to a private contact: alert call, radio check, remote monitor, radio enable, and radio disable.

To initiate a one touch call on the digital channel, press the **PTT** key after pressing the preprogrammed **One Touch Call** key.

Scan

The Scan feature allows you to listen to activities on a channel, keeping a track of your team members. With this feature enabled, the radio searches the scan list preset for the current channel and stay on a channel with activities.

Turning on or off the Scan Feature

To turn on or off the Scan feature, press the preprogrammed **Scan** key.

With the Scan feature enabled, the LED indicator slowly flashes orange. When detecting activities on a channel, the radio stays on it, and the LED indicator glows green.

Note

If you do not want to listen to the activities on the channel, press the preprogrammed **Nuisance Temporary Delete** key to temporarily remove the channel from the scan list.

Roam

The Roam feature allows you to enjoy seamless communication across sites or networks.

To turn on or off this feature, press the preprogrammed **Roam** key.

Talk Around

The Talk Around feature allows the radio to continue transmitting and receiving when the repeater is not operating, or when your radio is out of the repeater's coverage but within other radios' coverage.

To turn on or off this feature, press the preprogrammed **Talk Around** key.

TOT

The TOT feature allows the radio to automatically stop transmission and keep beeping when the period preset by your dealer expires. To stop beeping, release the **PTT** key. You need to wait for a certain period (also preset by your dealer) to initiate transmission again.

This feature aims to prevent a radio user from occupying a channel for an extended period and to avoid radio damage due to overheating.

VOX

The VOX feature allows you to transmit voice without pressing and holding the **PTT** key. The radio automatically transmits voice when the volume reaches the preset level.

To turn on or off this feature, press the preprogrammed **VOX** key.

Analog Services

The following features are available only on an analog channel.

Turning on or off the Monitor Feature

The Monitor feature allows the radio to receive weak signals.

To turn on this feature, press the preprogrammed **Monitor** key or press and hold the preprogrammed **Monitor Momentary** key. .

To turn off this feature, press the preprogrammed **Monitor** key again or release the preprogrammed **Monitor Momentary** key.

Turning on or off the Squelch Off Feature

The Squelch Off feature allows the radio's speaker to keep turned on no matter whether the squelch condition is satisfied.

To turn on this feature, press the preprogrammed **Squelch Off** key or press and hold the preprogrammed **Squelch Off Momentary** key. .

To turn off this feature, press the preprogrammed **Squelch Off** key again or release the preprogrammed **Squelch Off Momentary** key.

Personal Safety Services

The features described in this section ensure personal safety.

Using the Emergency Feature

The Emergency feature allows you to ask for help from your companion or the control centre in case of emergency.

In emergency mode, the radio gives different indications according to the preset emergency type. The available emergency types are as follows:

Emergency Type	Description
Siren Only	The radio sounds shrill alarm tones with visible indications.
Regular	The radio gives audible and visible indications.
Silent	The radio gives no audible or visible indication, and you cannot listen to a received call.
Silent w/ Voice	The radio gives no audible or visible indication, but you can listen to a received call.

Emergency Type	Description
Alarm w/ Siren	The radio sends an alarm and sounds shrill alarm tones with visible indications.

In addition, you can request your dealer to set one of the following emergency modes:

Emergency Mode	Description
Alarm	Allows you to send an emergency alarm.
Call	Allows you to initiate an emergency call.
Alarm W/Call	Allows you to send an emergency alarm and initiate an emergency call.

The three emergency modes can be combined with any of the following emergency types: **Regular**, **Silent**, and **Siren w/ Voice**.

Triggering the Emergency Mode

To trigger the emergency mode, press the preprogrammed **Emergency On** key. The radio then enters the preset emergency mode with or without indications depending on the preset emergency type.

Exiting the Emergency Mode

To exit the emergency mode (as the initiating party) or emergency alert mode (as the receiving party), press the preprogrammed **Emergency Off** key or turn off the radio.

Turning on or off the Lone Worker Feature

The Lone Worker feature allows the radio to enter the emergency mode when no operation is detected for a preset period.

To turn on or off this feature, press the preprogrammed **Lone Worker** key.

Communication Security Services

The features described in this section ensure communication security.

Using the Encrypt Feature

The Encrypt feature prevents eavesdropping and ensures communication privacy. It allows the radio to automatically encrypt transmitted voice or data. Only the receiving radio with the same key value or ID can decrypt the voice or data.

To turn on or off this feature, press the preprogrammed **Encrypt** key.

Turning on of off the Scrambler Feature

The Scrambler feature prevents eavesdropping and ensures communication privacy. It allows the radio to invert the frequency spectrum of transmitted audio signals. Only the receiving radio with the same scrambler setting can restore the audio signals.

To turn on or off this feature, press the preprogrammed **Scrambler** key.

Troubleshooting

Phenomena	Analysis	Solution
You cannot turn on the radio.	The battery may be installed improperly.	Remove and reattach the battery.
	The battery power may run out.	Recharge or replace the battery.
	The battery may suffer from poor contact caused by dirty or damaged battery contacts.	Clean the battery contacts or replace the battery.
During receiving, the voice is weak or intermittent.	The battery voltage may be low.	Recharge or replace the battery.
	The volume level may be low.	Increase the volume.
	The antenna may be loose or may be installed incorrectly.	Turn off the radio, and then remove and reattach the antenna.
	The speaker may be blocked.	Clean the surface of the speaker.
You cannot communicate with other group members.	The frequency or signaling type may be inconsistent with that of other members.	Verify that your TX/RX frequency and signaling type are correct.
	The channel type (digital or analog) may be set incorrectly.	Verify that you are on the correct digital or analog channel.
	You may be too far away from other members.	Move towards other members.
You hear unknown voices or noise.	You may be interrupted by radios using the same frequency.	Change the frequency, or adjust the squelch level.
	The radio in analog mode may be set with no signaling.	Request your dealer to set signaling for the current channel to avoid interference.

Phenomena	Analysis	Solution
You are unable to hear anyone because of too much noise and hiss.	You may be too far away from other members.	Move towards other members.
	You may be in an unfavourable position. For example, your communication may be blocked by high buildings or blocked in an underground area.	Move to an open and flat area, restart the radio, and try again.
	It may be the result of external disturbance (such as electromagnetic interference).	Stay away from equipment that may cause interference.

If the above solutions cannot fix your problems, or you may have some other queries, please contact your dealer for more technical support.

Care and Cleaning

To guarantee optimal performance as well as a long service life of the product, please follow these tips.

Product Care

- Do not pierce or scrape the product.
- Keep the product far away from substances that can corrode the circuitry.
- Do not hold the product by the antenna or earpiece cable.
- Close the accessory connector cover when no accessory is in use.

Product Cleaning

Caution

Turn off the product and disconnect the power supply before cleaning.

- Clean up the dust and fine particles on the product surface and charging piece with a clean and dry lint-free cloth or a brush regularly.
- Use neutral cleanser and a non-woven fabric to clean the keys, knobs, and front case after long-time use. Do not use chemical preparations such as stain removers, alcohol, sprays or oil preparations, so as to avoid surface case damage.
- Make sure the product is completely dry before use.

Optional Accessories

Contact your local dealer for the optional accessories used with the product.

Caution

Use the approved accessories only; otherwise, we will not be liable for any loss or damage arising out of the use of any unauthorised accessories.

Abbreviations

Abbreviation	Full Name
LED	Light-Emitting diode
LQO	Loudness and Quality Optimizer
PTT	Push-to-Talk
SK	Side Key
TOT	Time-out Timer
VOX	Voice Operated Transmit



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