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MANUAL
ENGLISH

ZODIAC | D 80/100/400 M

PROFESSIONAL RADIO



www.zodiac.se
www.zodiac.no



■INTRODUCTION

Thank you for choosing a Zodiac radio product. Zodiac D80/100/400 M are digital and analog professional mobile radios. Please read the manual carefully before you start using the radio, so that you have the necessary knowledge about the various functions.

■CONTENTS OF THE BOX

- Mobile radio
- Microphone
- DC power cable
- Mounting bracket
- Manual

■ACCESSORIES

Accessories can be found on www.zodiac.se / www.zodiac.no

■ KEY FEATURES

- DMR Tier II and analog mobile radio.
- Compact, rugged, high power and feature-rich.
- Large colorful graphical display.
- Highly customizable by dealer to suit most basic or complex communication system needs.
- Integrated GPS receiver with external GPS antenna.
- Several encryption levels in digital mode.
- Lone Worker.

DESCRIPTION OF THE RADIO

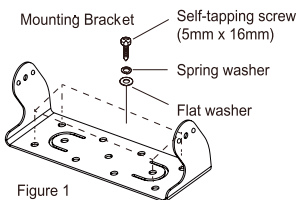
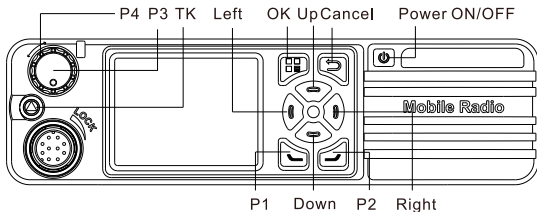


Figure 1

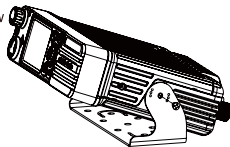


Figure 2

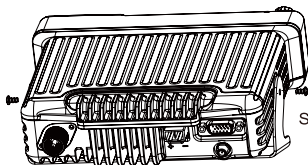


Figure 3

(Radio back)
DC Power Cable Connection

■ INSTALLATION

Transceiver preparation

Installation tools needed:

- Electric drill with 6mm bit or above.
- Cross head screwdriver.
- Hex socket sleeve (used for mounting 5mm x 16mm self-tapping screw).

When installing your transceiver, be sure to select a safe, convenient location. If you're installing inside your vehicle, choose a location that minimizes danger to your passengers and yourself while the vehicle is in motion.

Consider installing the unit so that knees or legs will not strike the unit during vehicle operation.

Try to pick a well ventilated location that is shielded from direct sunlight for your installation location.

Install the mounting bracket in the vehicle using the supplied self-tapping screws (4), flat washers (4) and spring washers (4).

Position the bracket so that the 3 long screw hole positions on the side of the mounting bracket are towards the rear of the bracket (Figure 1).

Use the 2 screw positions on the side of the mounting bracket to determine the appropriate angle of the transceiver (Figure 2). Position the transceiver, then insert and tighten the supplied hexagon SEMS screws (4) and flat washers (4).

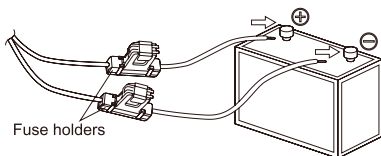
Double check that all hardware is securely fastened to ensure that vehicle vibration will not loosen the bracket or transceiver.

Mobile operation

Your vehicle battery must have a nominal rating of 12V. Never connect the transceiver to a 24V battery. Be sure to use a 12V vehicle battery that has sufficient current capacity. If the current to the transceiver is insufficient, the display may darken during transmission or transmit output power may drop excessively.

1. Route the DC power cable supplied with the transceiver directly to the vehicle's battery terminals using the shortest path from the transceiver. If using a noise filter, it should be installed with an insulator to prevent it from touching metal on the vehicle. We recommend you do not use the power outlet/ cigarette lighter socket as some power outlets have an unacceptable voltage drop. The entire length of the cable must be dressed so it is isolated from heat, moisture and the engine secondary (high voltage) ignition system/cables.
2. After the cable is in place, wrap heat-resistant tape around all fuse holders to protect it from moisture and tie down the full run of cable.
3. To prevent the risk of short circuiting, disconnect other wiring from the negative (-) battery terminal before connecting the transceiver.

Figure 4



4. Confirm the correct polarity of the connections, then attach the power cable to the battery terminals; red connects to the positive (+) terminal and black connects to the negative(-) terminal. Use the full length of the supplied cable without cutting off excess even if the cable is longer than required. In particular, never remove the fuse holders from the cable (Figure 4).

5. Reconnect any wiring removed from the negative terminal.

6. Connect the DC power cable to the transceiver's power supply connector. Press the connectors firmly together until the locking tab connectors firmly together until the locking tab clicks (Figure 5).

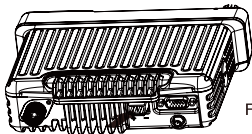


Figure 5

Antenna connection

Before operating the radio, install an efficient, well tuned antenna. The success of your radio installation will depend largely on the type and installation of your antenna. The transceiver will provide excellent results if the antenna system and radio installation are handled properly (Figure 6).

Use an antenna with an impedance of $50\ \Omega$ at the specific frequencies you will be using. Use low-loss coaxial feedline that have a characteristic impedance of $50\ \Omega$ to match the transceiver input impedance.

Connecting the transceiver to an antenna system (antenna and feedlines) with anything other than $50\ \Omega$ impedance will reduce the efficiency of the antenna system and can cause harmful interference to nearby electronic systems, including the transceiver itself.

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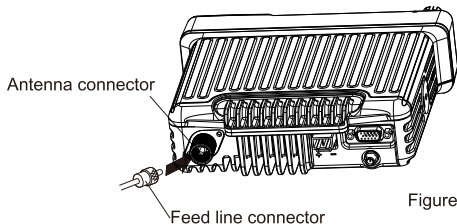


Figure 6

Caution:

Transmitting without first connecting an antenna or other matched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting. All fixed stations should be equipped with a lightning arrester to reduce the risk of fire, electric shock and transceiver damage.

Accessory Connections

Microphone jack

For voice communications, connect the microphone's 10-pin connector to the radio front panel and twist the locking ring to the right to lock it into place (figure 7).

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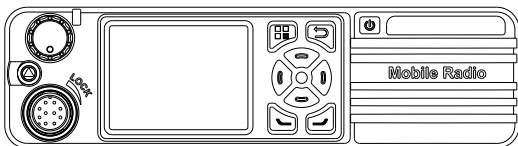
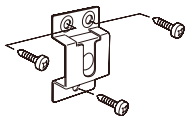


Figure 7



Microphone hanger

Attach the supplied microphone hanger using included screws in an easy to access location that will not interfere with vehicle operation (Figure 8).



Microphone hanger screws - 3mm x 10mm

Figure 8

■ OPERATIONAL STATUS INDICATORS

Your radio indicates its operational status through the following:

- Display icons
- Audio tones
- Sent item icons
- Call icons
- LED indicator

Display icons

The LCD display shows radio status, text entries, and menu entries. The following icons will appear on the radio's display.

LCD icons / status indication in radio

Icon Name	Icon	Radio Status
Received Signal Strength Indicator (RSSI)		The number of bars displayed represents the radio signal strength and is only displayed while the radio is in receiving mode.
Message Icons		New message/unread message
		Inbox is full
Call Icons		Private Call
		Group Call/All Call
Power Icons		Radio is set at low power (L) or high power (H)
Scan Icons		Scan feature is enabled
		Priority scan detects activity on channel/group designated as Priority 1 (if – is blinking) or Priority 2 (if – is steady)
Monitor		Selected channel is being monitored
Tones Disable		Tones are turned off
Emergency Icon		Radio is in Emergency mode
Privacy Icon		The Privacy feature is enabled
Talkaround Icon		The radio is currently configured for direct radio to radio communication.

Audio tones

Alert tones provide you with audible indications of the radio's status or the radio's response to data received.

Continuous tone: A monotone sound. Sounds continuously until termination.

Periodic tone: Sounds periodically depending on the duration set by the radio.

Repetitive tone: A single tone that repeats itself until it is terminated by the user.

Momentary tone: Sounds only once for a short period of time defined by the radio.

Sent items icons

The following icons appear at the top right corner of the radio's display in the Sent items folder.

 Sent Successfully

 Send Failed

Call icons

The following icons appear during a call and in the Contacts list to indicate ID type.



Private call: Indicates a Private Call in progress. In the Contacts list, it indicates a subscriber alias (name) or ID (number).



Group call/all call

Indicates a Group Call or All Call in progress. In the Contacts list, it indicates a group alias (name) or ID (number).

LED indicator

Blinking red - radio is at low battery condition.

Solid orange - powering up.

Solid green - radio is receiving or detecting activity over the air.

Solid red - radio is transmitting.

Blinking orange - radio is scanning or in selective call or emergency state.

■ BASIC FUNCTIONS

Powering up and press the red power key

You will see a Zodiac logo.

The LED light up solid orange and the home screen lights up if the backlight setting is set to turn on automatically.

To turn off the radio, press the red power key and you will see a brief Powering Down on the radio's display.

Adjusting the volume

To increase the volume, turn the volume control knob clockwise or volume up programmable key. To decrease the volume, turn this knob counterclockwise or down.

Making and receiving calls

1. Hold the microphone about 2 cm from your mouth when speaking and press the PTT (push to talk) button (Figure 9). The red LED lights during call.
2. Release PTT to return to the receive/listen (RX) mode. To receive your radio must be switched to the proper channel and set with matching signaling or Color Code and Group ID if used in digital mode.

Note on PTT: If the talk permit tone is enabled, wait until the short alert tone ends before talking. During a call, if the Channel Free Indication feature is enabled on your radio (programmed by your dealer), you will hear a short alert tone the moment the target radio (the radio that is receiving your call) releases the PTT button, indicating the channel is free for you to respond. You will also hear the Channel Free Indication tone if your call is interrupted, for example, when the radio receives an Emergency Call.

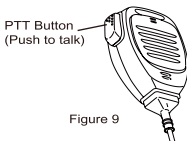


Figure 9

■ RADIO SPECIFICATIONS

General	
Power Supply	13.8V DC \pm 20%
Frequencies - Full Bandsplit	66-88MHz, 136-174MHz, 400-470MHz
Number of Channels	2000 Channels
Maximum number of Zones	250 Zones
Maximum number of Channels Per Zone	160
Channel Spacing	12.5/25kHz
Dimensions: H x W x D(mm) (With the remote header)	50 X 182 X 166mm
Weight: (g) (Not including installation holder)	1340g
Receiver Specifications	
Analog Sensitivity	.35 μ V/-116dBm(20 dB SINAD) .22 μ V/-120dBm(12 dB SINAD)
Digital Sensitivity	.3 μ V /-120dBm (BER 5%) .7 μ V /-115dBm (BER 1%)
Rated Audio	4W
Audio Distortion @ Rated Audio	5%

Transmitter Specifications	
Frequency Stability (-30°C to 60°C, 25°C Ref)	1.0 ppm
Power Output	1-25W (adjustable)
Modulation Limiting	$\pm 2.5\text{kHz}@12.5\text{kHz}$ $/\pm 5\text{kHz}@25\text{kHz}$
FM Hum & Noise	-40dB
Adjacent Channel Power	-60dB
FM Modulation Mode	12.5KHz : 11K0F3E /25kHz:16K0F3E
4FSK Digital Mode	12.5KHz (data only) : 7K60FXD 12.5KHz (data + voice) : 7K60FXE
4FSK Modulation Accuracy	5%@25°C, 10%@extreme temperature
Digital Protocol	ETSI TS 102 361-1,-2,-3
Audio Distortion	< 3%
Vocoder	AMBE + 2™

■ TROUBLE SHOOTING

Problems	Solutions
Communication range is too small.	<ul style="list-style-type: none">•Transmitting frequency has not been set on the channel and the radio has been remote killed.
Unable to transmit.	<ul style="list-style-type: none">•Transmitting frequency has not been set on the channel and the radio has been remote killed.
Cannot talk to or hear other members in your group.	<ul style="list-style-type: none">•Digital: Make sure the CC, ID, Time Slot is set right.•Analog: Make sure the signaling is set right.•Beyond the radio efficient communication range.
Other voices from non-group members are heard on the channel.	<ul style="list-style-type: none">•Analog: Change the CTCSS/DCS tone, and make sure change the tone on all radios in your group.
Noise is too loud.	<ul style="list-style-type: none">•Beyond the efficient communication range.

■ WASTE OF ELECTRONIC EQUIPMENT

Electric and electronic equipment can contain substances that are harmful for humans, animals and nature, if not handled properly. Equipment marked with the WEEE symbol, shall not be thrown together with normal waste, but should be delivered to the communitys recovery- or environment stations. Used batteries shall be delivered to recovery- or environment stations for recycling.



(WEEE = waste of electric and electronic equipment).



■ WARRANTY

The warranty from Zodiac covers failures and errors in materials, design and execution in a period of 24 months from the date the equipment was bought. For products with a limited lifetime, as for instance battery, antenna and other accessories, 12 months warranty applies.

A receipt or other proof of purchase is necessary for proper warranty handling. For professional use, other rules apply. If a failure occurs during normal operation of the product, it shall be returned to the dealer where it was originally bought, or an authorized service centre.

All freight costs will be paid by the owner. The equipment must be carefully packed in its original box or similar.

Failures that are related to wrong use, wear and tear, overvoltage, moist damage or other damage and repair by unauthorized persons, will not be covered by warranty.

The product will then be repaired by payment after the owners order.

■ DECLARATION OF CONFORMITY

Zodiac hereby declares that Zodiac D80/100/400 M is in compliance with all the essential requirements of RED Directive (2014/53/EU) and RoHs Directive (2011/65/EU/(EU) 2015/863).

Essentials requirement		Harmonized standards
RED Art.3.2	RF	ETSI EN 300 328 V2.2.2 (2019-07) ETSI EN 300 086 V2.1.2 (2016-08) ETSI EN 300 113 V3.1.1 (2020-06) ETSI EN 303 413 V1.2.1 (2021-04)
RED Art.3.1(b)	EMC	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-5 V2.2.1 (2019-04) ETSI EN 301 489-17 V3.3.1 (2024-09) ETSI EN 301 489-19 V2.2.1 (2022-09)
RED Art.3.1(a)	SAFETY	EN IEC 62368-1:2020+A11: 2020
RED Art.3.1 (a)	HEALTH	EN IEC 62311:2020 EM 50665: 2017

All essential radio test suites have been carried out.

Notified body: Bay Area Compliance Laboratories Corp.
Address: 12, Pulong East 1st Road, Tangxia Town,
Dongguan, Guangdong, China. Tel: +86 (0) 769 86858888

Zodiac D80 M can be used in Sweden and Finland.

Zodiac D100/400 M can be used in Sweden, Norway, Denmark, Iceland and Finland.

Contact your dealer or local telecom authority for information about frequency regulations in your country before use.

The Declaration of Conformity can also be found on our website - www.zodiac.se / www.zodiac.no

Zodiac Sverige AB, Staffans Väg 2, SE-192 78 Sollentuna, Sverige. Tel: +46 08 556 156 90 E-post: info@zodiac.se

Zodiac Norge AS, Stålfjæra 1, 0975 Oslo, Norge.

Tlf: +47 22 79 68 00 E-post: post@zodiac.no



Rolf Ramberg - CEO
24.04.25







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