

# Online ENGINE

## PINGER RECEIVER DIVER HELD OPERATING MANUAL

The PR1 Pinger Receiver is a portable, handheld acoustic receiver designed for locating and tracking acoustic pingers underwater

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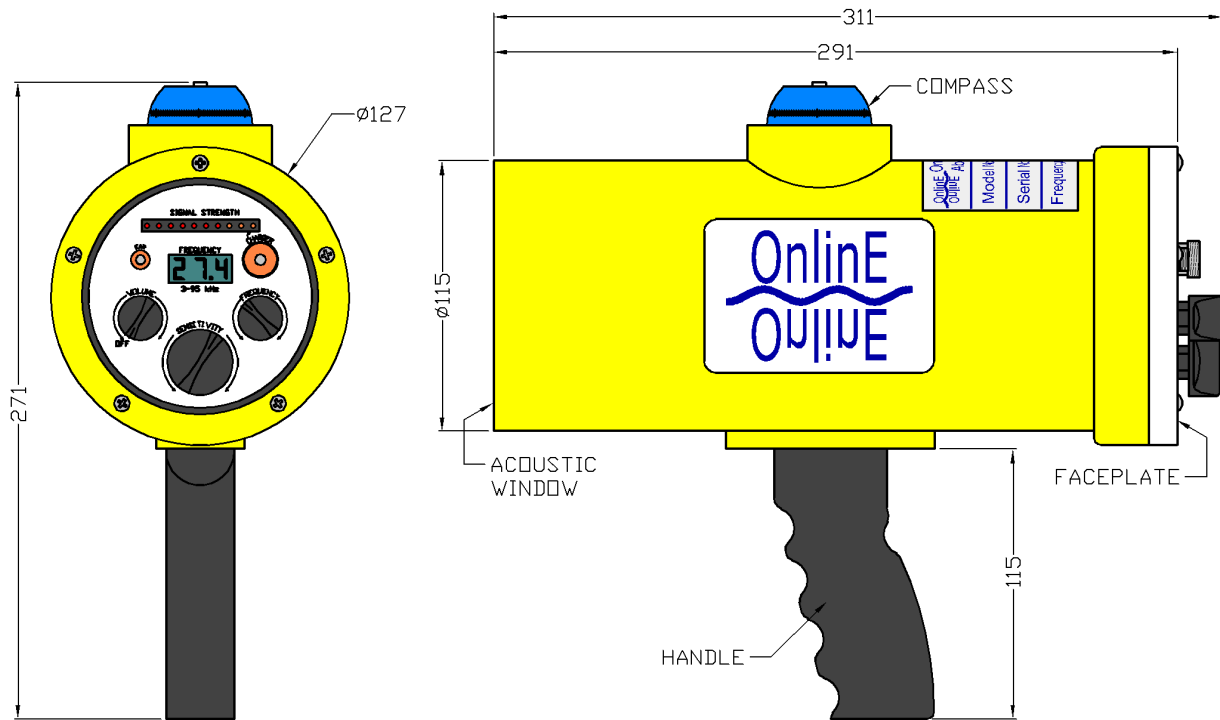
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# 1. GENERAL DESCRIPTION

The PR1 Pinger Receiver is a portable handheld acoustic receiver designed for locating and tracking acoustic pingers underwater. The PR1 has a bandwidth of 2kHz and the centre frequency that can be adjusted in 0.1kHz steps between 3kHz and 97kHz. The current frequency setting is displayed on a backlit LCD mounted on the faceplate.

The received signal strength is indicated via an LED Bar Graph (Signal Strength Meter) and through an audio output that connects to a Diver Earpiece (included).

The volume, frequency and sensitivity of the unit are controlled via knobs located on the faceplate. A magnetic compass is incorporated on the top of the unit.



**FIGURE 1: PR1 EXTERNAL ASSEMBLY**

The PR1 Pinger Receiver unit is directional and as such, only detects acoustic signals (of the selected frequency) that enter the receiver window within a (typically) 30° beam angle centred along its central axis. By scanning the PR1 around, the direction of any acoustic sources within range and of the target frequency, can be determined. Reducing the sensitivity also decreases the beam angle, allowing acoustic sources to be accurately pinpointed once in close proximity.

The PR1 is powered by a rechargeable NiCad battery pack that allows the unit to operate continuously for up to 17 hours before it requires recharging. The included battery charger requires a 240Va.c source in order to charge the battery.

## 2. SPECIFICATIONS

Battery Life.....	17 Hours Continuous
Battery Type.....	10.8V Rechargeable NiCad Battery Pack
Frequency Range.....	3kHz to 97kHz
Bandwidth .....	2kHz
Directivity.....	30° (Typical)
Max Operating Depth .....	180m
Weight in Air.....	3.3kg
Weight in Water .....	-0.1kg (Slightly Buoyant)
Housing Material .....	High Impact PVC

## 3. OPERATION

### 3.1. PR1 FUNCTION TEST

An acoustic pinger with a known frequency and pulse rate is required in order to function test the PR1 Pinger Receiver unit.

1. Activate the test pinger within range of the PR1 Pinger Receiver. If testing in air, a range of approximately 5cm should be used.
2. Turn the unit on by rotating the Volume Control Knob clockwise. There should be a noticeable click at the beginning of travel and the LCD in the centre of the front panel should illuminate and display the current frequency setting. Continue rotating the volume knob until it reaches its limit at which point the volume has been set to maximum. Note: If the LED at the far right of the Signal Strength Meter is flashing the unit should be charged overnight before proceeding (see SECTION 3.3).
3. Use the Frequency Control Knob on the faceplate to adjust the frequency setting of the PR1 unit to match that of the test pinger. Use the Sensitivity Control Knob to set the sensitivity to maximum. Ensure that the acoustic window is pointing towards the pinger and confirm that the Signal Strength Meter is registering a pulsing signal that matches the pulse rate of the test pinger.

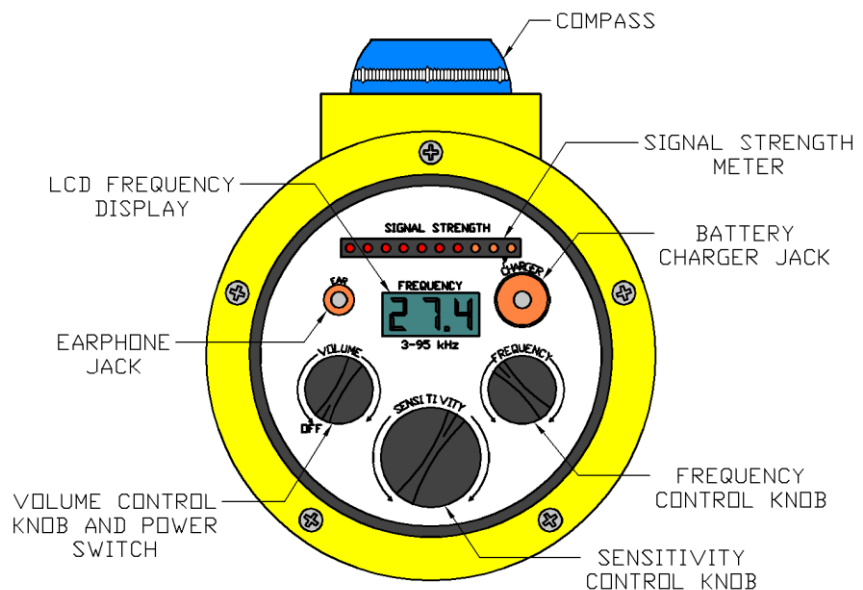


FIGURE 2: PR1 FACEPLATE DETAIL

4. While maintaining the separation between the PR1 unit and the test pinger, slowly adjust the frequency control back and forth to find the setting which registers the highest signal strength on the Signal Strength Meter. Turn down the sensitivity if the signal strength reaches full scale. Confirm that a clear signal is being received and that the frequency and pulse rate are as expected.
5. Turn the pinger OFF and ON multiple times and confirm that the received signal follows this behaviour.
6. Connect the supplied earphone connector to the Earphone Jack on the PR1 faceplate. Confirm that a "Chirp" can heard through the earpiece and that the pulse rate matches that of the target pinger. The Volume Control Knob should be adjusted as required.
7. Providing all the steps above were completed successfully, the unit has now passed the function test.

### **3.2. PR1 DEPLOYMENT AND OPERATING INSTRUCTIONS**

Prior to deployment, the unit should be charged overnight to ensure that the batteries are at fully capacity.

Ensure that a function test has been completed (see SECTION 3.1 above) prior to deployment. This is to make sure that the unit is working correctly and to ensure that the operator is acquainted with the operation of the device.

For best results, the supplied earphone should be connected and the audio signal used in conjunction with the Signal Strength Meter to locate and identify signals.

As with all acoustic systems, ambient acoustic noise in the environment will have a significant impact on the performance of the PR1 unit. Some of the most common sources of ambient acoustic noise are vessel engines, water turbulence and rough weather.

Also be aware that there may be nearby acoustic sources unexpectedly transmitting at the frequency of interest. These should be disabled if possible. For example, any acoustic beacons on any ROVs must be disabled and any support vessels with dynamic positioning systems should be disabled or configured to work outside of the frequency of interest if possible.

The typical procedure for locating an acoustic pinger is given below. This procedure assumes that the operator knows the expected frequency and pulse rate of the target pinger.

1. Turn the unit on by rotating the Volume Control Knob clockwise. There should be a noticeable click at the beginning of travel and the LCD in the centre of the front panel should illuminate and display the current frequency setting. Continue rotating the volume knob until it reaches its limit at which point the volume has been set to maximum.
2. Adjust the receiver frequency setting using the Frequency Control Knob until the frequency of the target pinger is displayed on the LCD Frequency Display. Note that the bandwidth of the receiver is approximately 2kHz, so it will detect pingers transmitting at frequencies within  $\pm 1\text{kHz}$  of the centre frequency displayed on the LCD. However, the received signal strength will be greater when the centre frequency is set to the same frequency as the source.
3. Adjust the receiver sensitivity control clockwise until a background noise level of approximately 30% is registered on the Signal Strength Meter (this is typically the optimum setting for identifying an acoustic signal). It will be extremely difficult to detect a signal if the background noise is more than 70%. If the background noise is more than 70% then the sensitivity should be reduced or the source of the excessive

background noise should be identified and removed. If connected, a "hiss" should be audible through the earphone.

4. Guess the direction of the target pinger and point the receiver window in that direction. Slowly scan the PR1 around to see if you can pick up a signal. If you cannot pick up a signal, make sure that you pan around a full 360°. If you are still unable to detect a signal, move to a different area and repeat this step.
5. Once you think you have detected a signal, check that the repetition rate of the received signal matches that of the target pinger. Providing the ping rate matches, turn the receiver sensitivity down so that the signal can be clearly heard without any background noise.
6. Make a slow 360 degree sweep. This time you are looking for additional signals. Note: pingers send their signal out in all directions. If you pick up multiple signals, try to determine which direction gives the strongest and clearest signal, as this is likely to be the direction of the pinger. Weaker signals are likely to be reflections of the original signal. Note: When the transmitted signal hits an object e.g. a rock, boat bottom, wreck, water surface, ocean bottom, fish, etc., it reflects off that object and heads in a different direction (usually at a significantly reduced signal strength).
7. Once you have identified the direction of the strongest signal, move in this direction and try to get as close as possible to the pinger. As you move toward the strongest signal, slowly point the receiver to the left and to the right to confirm that you are still heading towards the centre of the source. The signal should get stronger the closer you are to the pinger, meaning that you should gradually reduce the sensitivity of the PR1 as you get closer. This also has the effect of narrowing the beam angle, which should then make it easier to pinpoint the exact location of the pinger once you are in close proximity.

### **3.3. PR1 BATTERY PACK CHARGING PROCEDURE**

**WARNING: ONLY USE THE MASCOT 9581 CHARGER PROVIDED TO CHARGE THE PR1.**

The procedure for charging the battery is shown below.

1. Make sure that the receiver is turned OFF.
2. Gently clean the Charger Jack on the faceplate of the PR1 using a damp cloth.
3. Attach the charger connector to the Charger Jack, taking care not to over-tighten.
4. Plug the charger into wall socket (240 Va.c. only).
5. The Charge LED, located directly above the Charger Jack, should be illuminated while charging is taking place (if it is not illuminated, check the charger connections).
6. The battery requires 12-14 hours to recharge fully. When fully charged, the battery will provide up to 17 hours of continuous use.

Additional guidelines to maintain good battery performance:

- It is best to recharge the battery overnight after 10 to 15 hours of use.
- Avoid charging the battery for more than 24 hours as overcharging can shorten the battery life.

- For optimum performance, the battery pack should be discharged fully before charging overnight as this helps to reduce the problem of "battery memory" associated with NiCad batteries. As a minimum, this should be done at least once per year.

## 4. MAINTENANCE

The PR1 Pinger Receiver was designed to be maintenance free and is constructed out of corrosion resistant materials. However, as with most diving equipment, it is recommended that it be rinsed in fresh water after use and stored in a cool, dry place.

The Receiver Window should be protected from damage at all times. Do not sit the PR1 on a surface with the Receiver Window face down.

The Receiver Window should be kept clean using soap.

If the unit is disassembled, the 'O' rings should be lubricated with a silicon based lubricant before the unit is reassembled.

The charger and earphone connectors do not need to be "capped" when the unit is deployed as exposure to salt water will not affect these connectors.

## 5. WARRANTY

Online products are guaranteed for one year from the date of purchase. Goods should be returned transportation prepaid to Online Electronics Limited.

There is no charge for parts or labour should any product require repair due to a manufacturing deficiency during the guarantee period.

In the event of a manufacturing deficiency, the inward transportation costs will be repaid to the client.

## 6. DISPOSAL OF UNIT

Online Electronics Ltd (OEL) takes its responsibilities under the WEEE Regulations extremely Seriously and has taken steps to be compliant in line with our corporate and social responsibilities. In the UK, OEL has joined a registered compliance scheme WeeeCare (registration number **WEE/MP3538PZ/SCH**)

Electrical and electronic equipment should never be disposed of with general waste but must be collected separately for the proper treatment and recovery.

The crossed out bin symbol, placed on the product, reminds you of the need to dispose it correctly at the end of its life.

When buying a new product you will have the possibility to return, free of charge, another end of life product of equivalent type that has fulfilled the same functions as the supplied equipment. These items may be deposited at: Online Electronics Ltd, Online House, Woodburn Road, Blackburn Business Park, Blackburn, Aberdeen, AB21 0PS, UK

Alternatively, to arrange a collection of any waste electrical equipment, obligated to OEL please telephone WeeeCare on **0844 800 2004**