



# **Pinger Receiver Topside & Hydrophone Operating Manual**

**The 2001RS Standard Hydrophone system is a quick deployable, battery powered, acoustic receiver system which can be used for tracking and locating underwater beacons or acoustic pingers.**



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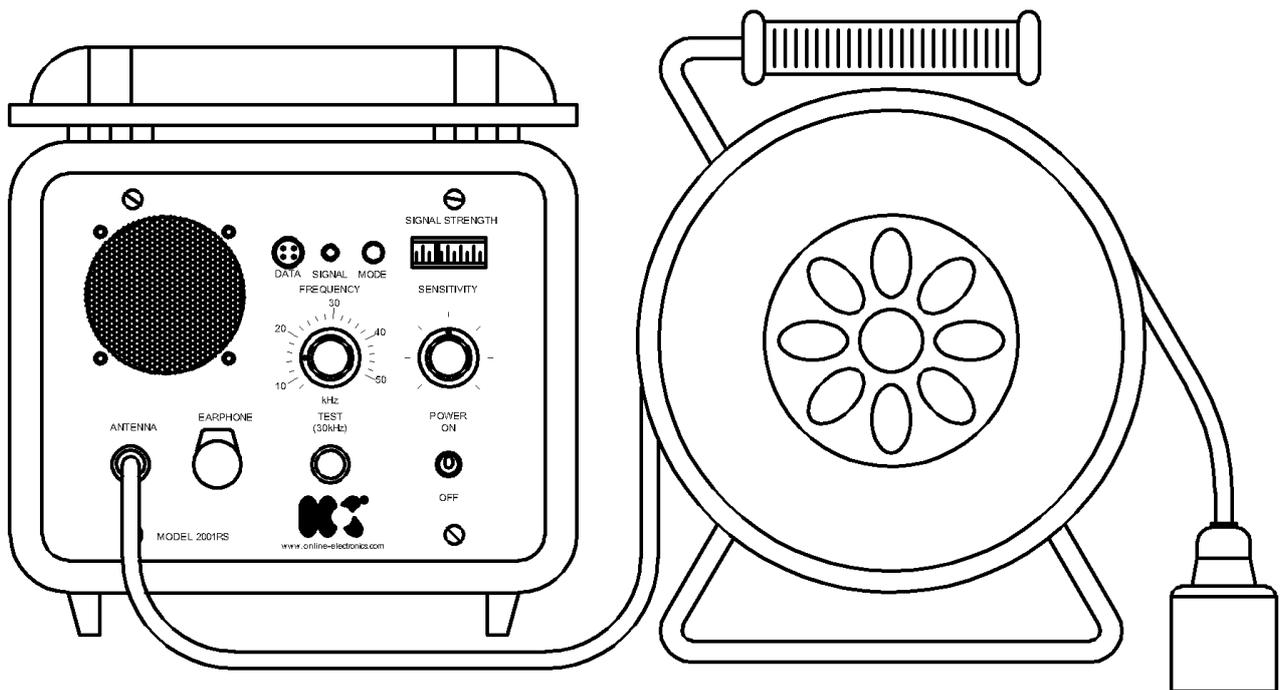
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# 1. GENERAL DESCRIPTION



The 2001RS Pinger Receiver is a portable, battery powered, acoustic receiver, tuneable to all frequencies between 8 kHz and 50 kHz which can be used for tracking and locating underwater acoustic transmitters. The receiver has loudspeaker and headphone audio outputs, an easy to interpret signal meter, simple frequency and sensitivity controls and self-test / battery test functions. The 2001RS is used with the OEL Standard Hydrophone when deployed.

The Standard Hydrophone is omnidirectional, relatively insensitive to direction and can be quickly and easily deployed over the side of vessels. It is ideally suited to receive the signal from warning beacons or alarm pingers. It can be supplied on either 50m, 100m or 150m cable reel dispenser for ease of deployment.

## 2. SPECIFICATIONS

### 2001RS PINGER RECEIVER

Frequency Range.....	8kHz to 50kHz
-6dB Bandwidth .....	1kHz
Battery life at +5°C .....	150 Hours continuous
Battery type .....	12 VDC (8x DURACELL ID1300 D CELLS)
Operating temperature range.....	-2°C to +50°C
Height.....	178mm
Width.....	268mm
Depth .....	241mm
Weight .....	4.4 kg

### STANDARD HYDROPHONE

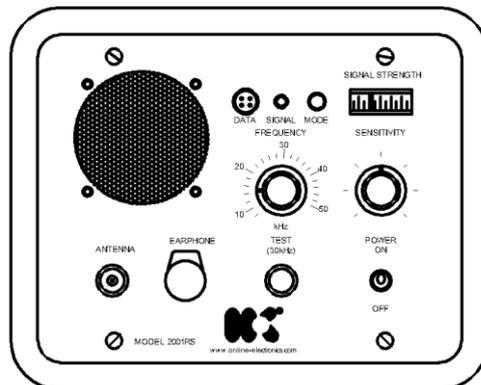
Connector type .....	BNC
Operating depth .....	200m
Approx. Height on 50m Dispenser .....	308mm
Approx. Diameter on 50m Dispenser.....	240mm
Approx. Weight 50m on Dispenser.....	3.8kg

### 3. OPERATION

Before each deployment ensure that all checks in section 3.1 PRE-DEPLOYMENT CHECKS are completed.

As with all acoustic systems, the ambient acoustic noise existing in the environment will have a significant impact on the performance of the 2001RS system. 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 transmitters unexpectedly transmitting at the frequency of interest. For example any acoustic beacons on the ROV 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 detecting an acoustic transmitter is given below. This procedure assumes the operator knows the expected frequency and pulse rate of the acoustic transmitter being searched for.

1. Turn the unit ON using the 'POWER' toggle switch and adjust the FREQUENCY control to the expected frequency of the acoustic transmitter.
2. Connect the hydrophone to the 2001RS ANTENNA input
3. Lower the hydrophone over the side of the vessel as close as possible to the expected location of the transmitter of interest. Weights may be required to stop the hydrophone from drifting due to sea currents or thruster activity. The weights should be attached to a rope running parallel to the cable. Never attach weights directly to the hydrophone cable otherwise the cable may be stretched and damaged.
4. Adjust the SENSITIVITY control until a background noise level of approximately 30% is achieved 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 a source for the excessive background noise must be identified and removed.
5. Very slowly adjust the FREQUENCY control back and forth while listening to the received signal and watching the SIGNAL STRENGTH meter to find the frequency setting which gives the strongest and clearest signal.
6. Try adjusting the SENSITIVITY up and down slightly to see if there is a setting which gives a clearer signal. Maximum sensitivity is not always best, especially if there is a lot of background noise. A good guide is to keep the background noise level at around 30% on the SIGNAL STRENGTH meter.
7. Confirm that the FREQUENCY and pulse rate of the acoustic signal are as expected. Be aware that there may be other acoustic transmitters in the environment (such as ROV beacons or dynamic positioning beacons). These sources should be disabled if possible, otherwise it should be possible to identify the signal of interest by carefully examining frequency and pulse rate.

### **3.1. PRE-DEPLOYMENT CHECKS**

Before each deployment ensure that the following checks have been completed.

1. Visually inspect all system components to ensure that they are secure and undamaged. Pay particular attention to all cables and connectors.
2. Ensure that the unit is turned on and the batteries are showing more than 50% remaining capacity. Refer to section 3.4 BATTERY TEST AND REPLACEMENT
3. Complete a 3.2 SYSTEM SELF TEST and 3.3 SYSTEM FUNCTION TEST
4. Confirm that any weights attached to the hydrophone are attached in such a way as that the cable will not become stretched and damaged. Weights should be attached to a rope running parallel with the cable only.
5. If using AUDIOSCOPE, confirm that it has been configured and tested as per the AUDIOSCOPE manual.

### **3.2. SYSTEM SELF TEST**

1. Turn the unit ON using the 'POWER' toggle switch.
2. Pressing and holding the TEST button will make the unit activate an internal, 1 ping per second, 30kHz test signal.
3. While holding the TEST button, turn the FREQUENCY control to 30kHz and turn the SENSITIVITY control to approximately mid-point. Confirm that every second an audible "ping" is heard (via the headphones or the speaker) and the RED SIGNAL LED lights. Slowly adjust the FREQUENCY control back and forth to find the setting around 30kHz which gives maximum signal strength.
4. Turn the SENSITIVITY control clockwise and anti-clockwise and confirm the volume of the 'ping' gets louder and quieter respectively.
5. Adjust the FREQUENCY control and confirm that the ping is inaudible below approximately 27kHz and above 33kHz
6. To determine the unit battery status, press and hold the TEST button. The SIGNAL STRENGTH meter will now give an indication of battery capacity remaining. If less than 50% is indicated then change the batteries as per section 3.4 BATTERY TEST AND REPLACEMENT

### **3.3. SYSTEM FUNCTION TEST**

1. Ensure the 3.2 SYSTEM SELF TEST has been completed to verify the operation of the 2001.
2. Ensure the 'PREAMP' switch is in the 'STANDARD' position (the PREAMP switch is located beneath the front panel which can be removed by unscrewing the 4x captive screws at each corner).
3. Connect the hydrophone to the ANTENNA input.
4. Activate a test transmitter of known frequency and pulse rate within range of the standard hydrophone. A range of approximately 5cm should be used if in air.

5. Adjust the FREQUENCY control to the transmitter frequency and set SENSITIVITY to mid-point. Confirm that an audible 'ping' is heard (via headphones or the speaker), the RED SIGNAL LED lights and that the SIGNAL STRENGTH meter indicates the signal strength at the expected pulse rate. Slowly adjust the FREQUENCY control back and forth to find the setting which gives maximum signal strength. Turn down the SENSITIVITY if the signal strength is reaching full scale on the SIGNAL STRENGTH meter. Confirm a clear signal is received at the correct frequency and pulse rate.
6. If a test transmitter is not available then a crude signal can be generated by very gently tapping the hydrophone with a finger. It should be possible to detect this with the FREQUENCY set to approximately 9kHz and SENSITIVITY set to approximately mid-point.
7. Turn off any test transmitters and remove any local sources of noise and/or vibration. With SENSITIVITY set to mid-point, slowly sweep the FREQUENCY control from 8kHz to 50kHz and confirm that the SIGNAL STRENGTH meter never exceeds 50%. This confirms that the background noise level is acceptably low and in particular there is nothing causing electrical interference in the system.
8. If all results are as expected then the system is functional.

### **3.4. BATTERY TEST AND REPLACEMENT**

To determine unit battery status, press and hold the TEST button. The SIGNAL STRENGTH meter will now give an indication of battery capacity remaining. If less than 50% is indicated then change the batteries as described below.

1. Ensure the POWER switch is in the OFF position.
2. Loosen the four panel screws on the corners of the unit front panel and lift out the assembly.
3. Loosen the four BATTERY COVER screws and remove the BATTERY COVER.
4. Check for any signs of corrosion on the battery holder contacts. Clean if necessary, a light coating of silicone grease will inhibit future corrosion.
5. Install new batteries observing the correct polarity.
6. Install the BATTERY COVER, do not over tighten screws.
7. Refit the front panel assembly. Ensure that the four panel screws are all partially engaged before tightening. Ensure the gasket is properly seated. **DO NOT OVER TIGHTEN THE MOUNTING SCREWS.**
8. Switch the unit ON and depress the 'TEST' button.
9. Verify that the meter needle is showing full scale with new batteries fitted.
10. Turn the unit OFF.

## 4. MAINTENANCE

**NOTE 1 - DO NOT EXPOSE TO AGGRESSIVE SOLVENTS OR CHEMICALS WHICH COULD BE HARMFUL TO THE HOUSING, NITRILE RUBBER O-RINGS, OR CONNECTORS.**

**NOTE 2 - OPENING OF HOUSINGS SHOULD ONLY TAKE PLACE IN A CLEAN, DRY, LABORATORY ENVIRONMENT.**

**NOTE 3 - TO PREVENT THE FORMATION OF CONDENSATION WITHIN THE UNIT ALLOW THE UNIT TO STABILISE WITHIN THE LABORATORY ENVIRONMENT FOR A MINIMUM OF 6 HOURS PRIOR TO OPENING.**

All Online Electronics Ltd products are designed to require minimum maintenance. The housings should be cleaned using fresh water and cleaning agents as necessary. Do not use chemicals which could be damaging to the housing, the nitrile rubber O-rings, or any connectors.

If the unit is to be placed in storage for a long period of time ensure the unit has been cleaned using fresh water and disconnect all batteries.

## 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**