



**RJE INTERNATIONAL, INC.**

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*ARS-100 Acoustic Reference Source*



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## PROPRIETARY MATERIAL

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RJE International, Inc. (RJE) guarantees its products to be free from defects in materials and workmanship for a period of one year from the date of shipment. In the event a product malfunctions during this period, RJE's obligation is limited to the repair or replacement, at RJE's option, of any product returned to the RJE factory. Products found defective should be returned to the factory freight prepaid and carefully packed, as the customer will be responsible for any damage during shipment.

Repairs or replacements, parts, labor, and return shipment under this warranty will be at no cost to the customer. This warranty is void if, in RJE's opinion, the product has been damaged by accident or mishandled, altered, or repaired by the customer, where such treatment has affected its performance or reliability. In the event of such mishandling, all costs for repair and return freight will be charged to the customer. All products supplied by RJE that are designed for use under hydrostatic loading have been certified by actual pressure testing prior to shipment. Any damage that occurs as a direct result of flooding is NOT covered by this warranty.

If a product is returned for warranty repair and no defect is found, the customer will be charged a diagnostic fee plus all shipping costs. Incidental or consequential damages or costs incurred as a result of a product's malfunction are not the responsibility of RJE.

Equipment not manufactured by RJE is supported only to the extent of the original equipment manufacturers ( ) original warranties. All sensors that utilize electrodes (oxygen cartridges, pH, ORP, etc.) are warranted at the time of shipment, and shall perform upon initial installation within stated specifications. If the product proves to be defective within the warranty, RJE will replace the product or defective part with a similar model, product or part, but only to the extent that the warrants.

All returned products must be accompanied by a Returned Material Authorization (RMA) number issued by RJE. Shipments without an RMA number will not be accepted.

## LIABILITY

RJE shall not be liable for incidental or consequential damages, injuries, or losses as a result of the installation, testing, operation, or servicing of RJE products.

## **RMA RETURN PROCEDURE**

Before returning any equipment to RJE International, you must contact RJE and obtain a Returned Material Authorization (RMA) or case number. The case number assists RJE in identifying the origin and tracking the location of returned items.

When returning items to RJE from outside the United States, follow the checklist presented below to prevent any delays or additional costs.

- Include with all shipments two copies of your commercial invoice showing the value of the items and the reason you are returning them. Whenever possible, send copies of the original export shipping documents with the consignment.
- Route via courier (FedEx or UPS).
- If there is more than one item per consignment, include a packing list with the shipment. It is acceptable to combine the commercial invoice and packing list with the contents of each carton clearly numbered and identified on the commercial invoice.
- If it is necessary to ship via air freight, contact RJE for specific freight forwarding instructions. You will be charged for customs clearance and inbound freight.
- Insure the items for their full value.
- Refer to the RJE issued case number on all documents and correspondence.
- Prepay the freight.

## **TITLE**

Title shall pass to buyer on delivery to carrier at Irvine, CA. Risk of damage or loss following such delivery shall be to the buyer and RJE International, Inc shall in no way be responsible for safe arrival of the shipment. Title shall so pass to buyer regardless of any provision for payment of freight or insurance by RJE International, Inc or of the form of shipping documents. If shipment is consigned to Falmouth Scientific, it shall be for the purpose of securing buyer's obligations under the contract.

# INTRODUCTION

## 1 ARS-100 Acoustic Reference Source Overview

The ARS-100 Acoustic Reference Source is an acoustic sound source design to provide an active marker for use with sound recording devices. The unit includes acoustic sound source electronics in a 200 meter rated pressure case with an omni-directional transducer. A deep water version is available that can operate to 1000 meter.

The ARS-100 is a battery operated acoustic transmitter that provides the electronics and matching network to drive the omni-directional transducer attached to the end cap. The transmitter has 16 user selectable transmit modes; 8 test modes, and 8 chirp output modes as well as mechanical plunger switch to turn the transmitter On and OFF. Once turned on the transmitter will chirp per the switch setting every 30 minutes. A high accuracy temperature controlled crystal controls the timing.

The Omni-Directional transducer is a free flooded ring designed to provide a near Omni-Directional beam pattern with an operating depth of 200m or 1000m based on the model.

# SPECIFICATIONS

## 2 ARS-100 Specifications

Acoustic Source Level	+145 +0/- 10 dB re 1μPa @ 1 meter
Transmit Repetition Rate	30 minutes
Timing Crystal Accuracy	+/-1 minute per year
Transmit Pulse Length	See Table 1
Transmit Frequency	4kHz – 7kHz
Activation	Plunger Switch on transducer end cap
Operating Life	13Months
Transducer Beam Pattern	Omni-Directional
Operational Depth	
ARS-100	200 meters
ARS-100D	1000 meters
Housing Material	
ARS-100	PVC
ARS-100D	Aluminum

## OPERATIONS & INSTALLATION NOTES

### 3.0 Installing/Replacing the ARS-100 battery

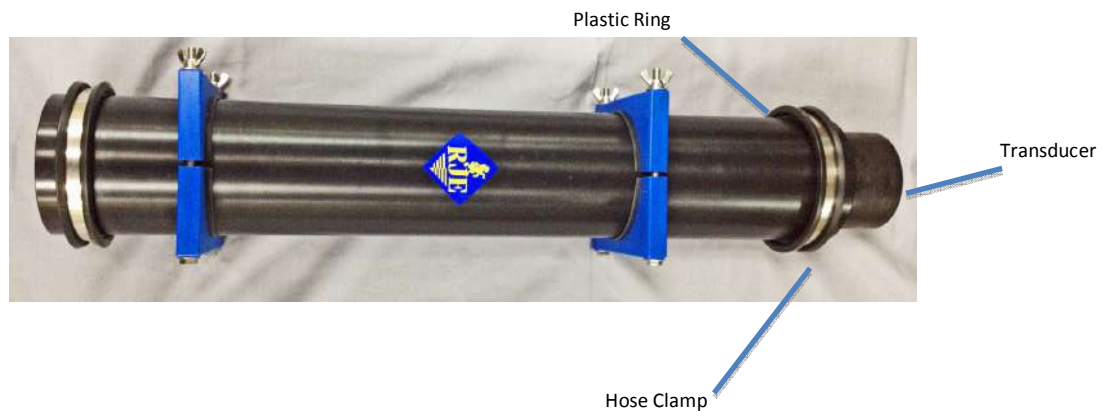
**WARNING: Do not store or ship the ARS-100 with battery installed. Batteries should only be installed immediately prior to deployment.**

The battery in the ARS-100 should be replaced/installed prior to each use. To change the ARS-100 battery follow this procedure:

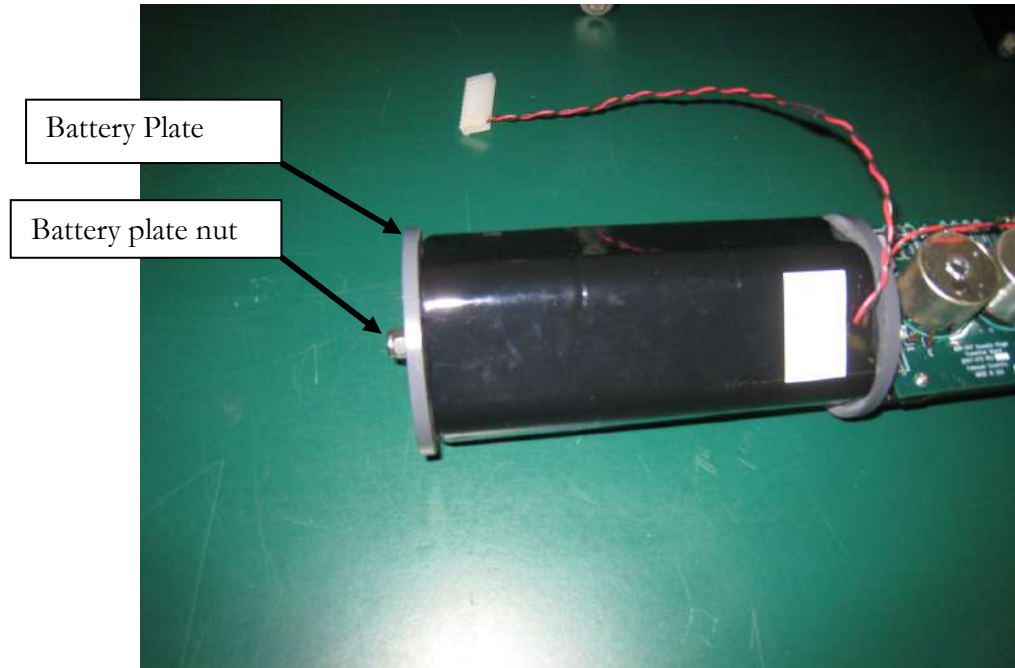
- First wipe the housing down to remove any water drops or standing water around the end cap seals. Unscrew the transducer end cap from the electronics housing using the supplied spanner wrench while firmly grasping the housing. Rotate the end cap counter clockwise.



- For the ASR-100D, loosen the hose clamp just below the transducer assembly until the plastic ring below can be slipped down the housing assembly. Gently pull the transducer end cap from the housing.

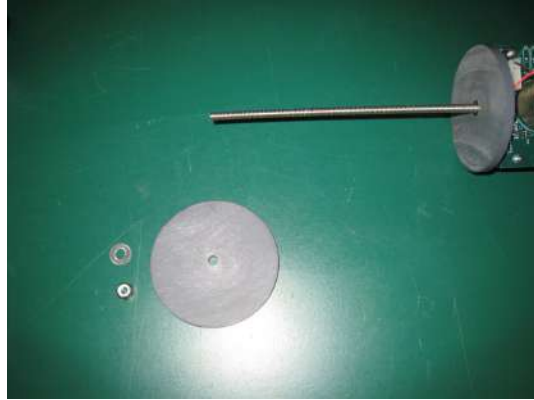


- Once the end cap is loose carefully remove the electronics assembly from the pressure housing.
- Remove the old battery by removing the battery plate nut with a 7/16" nut driver

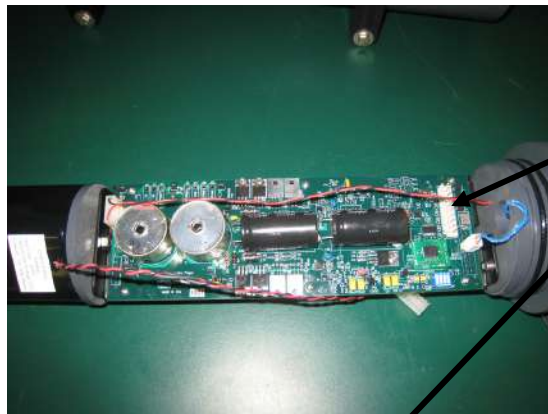


- Slide the battery off the threaded rod.

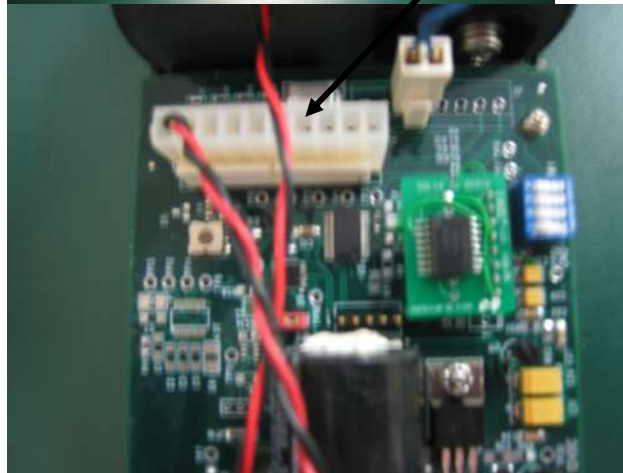




- Install the new battery by reversing the order of disassembly. Plug battery cable connector into Transmit/processor PCB as shown.



Battery Connector



- Install the electronics assembly back in the pressure housing. Slide the electronics into the housing until the first O-ring is seated.



- Rotate the electronics assembly clock wise by hand making sure the closure threads are engaged properly. Once the threads are engaged properly, use the supplied spanner wrench to rotate the electronics assembly until it is seated onto the housing.



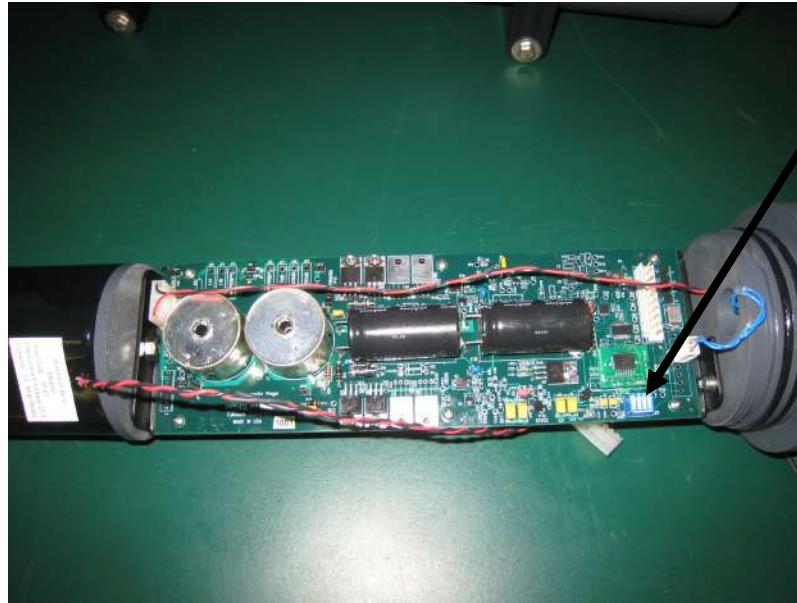
- Do not over tighten, once the electronics assembly seats against the housing stop turning.
- For the ASR-100D, install the electronics assembly back in the pressure housing. Slide the electronics into the housing until the first O-ring is seated. Slide the plastic ring/hose clamp toward the transducer until it fits into the two grooves in the housing. Firmly tighten the hose clamp until the assembly is firm. Do not overnighted.





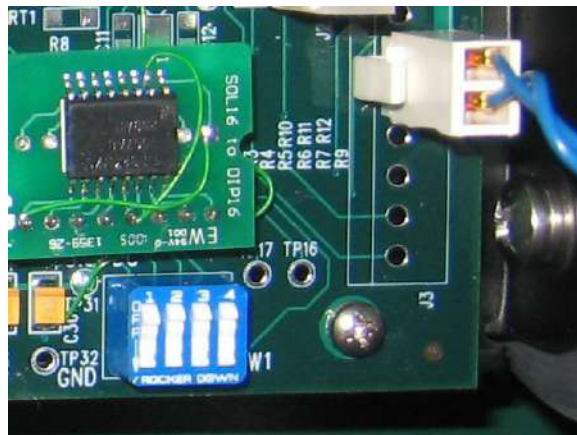
## 4.0 Setting the ARS-100 Transmit Select Dip Switches

- Orient the ARS-100 assembly so the switch is located as shown



Transmit Select Dip Switch

- Set the switch positions of SW1 to the position for the desired Chirp output mode per table 1 below.



	S1	S2	S3	S4	# of chirps	Interval between chirps	Direction	Signal ON Time	Freq	Signal Period
Single Freq	ON	ON	ON	ON	N/A	N/A	N/A	continuous	7.0 kHz	N/A
	OFF	ON	ON	ON	N/A	N/A	N/A	10ms	7.0 kHz	1000 ms
	ON	OFF	ON	ON	N/A	N/A	N/A	10ms	6.5 kHz	1000 ms
	OFF	OFF	ON	ON	N/A	N/A	N/A	10ms	6.0 kHz	1000 ms
	ON	ON	OFF	ON	N/A	N/A	N/A	10ms	5.5 kHz	1000 ms
	OFF	ON	OFF	ON	N/A	N/A	N/A	10ms	5.0 kHz	1000 ms
	ON	OFF	OFF	ON	N/A	N/A	N/A	10ms	4.5 kHz	1000 ms
	OFF	OFF	OFF	ON	N/A	N/A	N/A	10ms	4.0 kHz	1000 ms
Chirp	OFF	OFF	OFF	OFF	4	500 ms	UP	498 ms	4 to 7khz	30 mins
	ON	OFF	OFF	OFF	5	500 ms	UP	498 ms	4 to 7khz	30 mins
	OFF	ON	OFF	OFF	6	500 ms	UP	498 ms	4 to 7khz	30 mins
	ON	ON	OFF	OFF	7	500 ms	UP	498 ms	4 to 7khz	30 mins
	OFF	OFF	ON	OFF	4	1000 ms	UP	498 ms	4 to 7khz	30 mins
	ON	OFF	ON	OFF	5	1000 ms	UP	498 ms	4 to 7khz	30 mins
	OFF	ON	ON	OFF	6	1000 ms	UP	498 ms	4 to 7khz	30 mins
	ON	ON	ON	OFF	7	1000 ms	UP	498 ms	4 to 7khz	30 mins

Table 1

## 5.0 ARS-100 activation, synchronization

- To activate the ARS-100 push in the plunger switch on the transducer end cap.



Plunger Switch pushed in 'Activated'

- Once activated, the selected Chirp output will begin after a 0.50 seconds delay and repeat every 30minutes until deactivated or the battery is depleted.
- The ARS-100 can also be re-started or re-synchronized by pressing the push button switch shown below. Once the reset push button is pressed the selected chirp output will begin after a 0.50 second delay and repeat every 30 minutes until deactivated or the battery is depleted.

Reset Push Button Switch

