RBR*solo* and RBR*duet* operation and maintenance

This section of the manual covers the basic operation of the RBR*solo* and RBR*duet* data logger: changing the battery, inspecting and replacing O-rings, inserting desiccant, etc. Please see the Ruskin RBR*solo* and RBR*duet* manual for instructions relating to logger programming and data retrieval.

Opening and closing the logger

To open an RBR*solo/duet* logger, unscrew the sensor end counter-clockwise while holding on to the yellow housing. Once fully unscrewed, the housing can be carefully slid away from the sensor end cap, revealing the sensor carriage.

The sensor carriage contains the battery compartment; desiccant holder and USB port (Figs. 1 and 2).

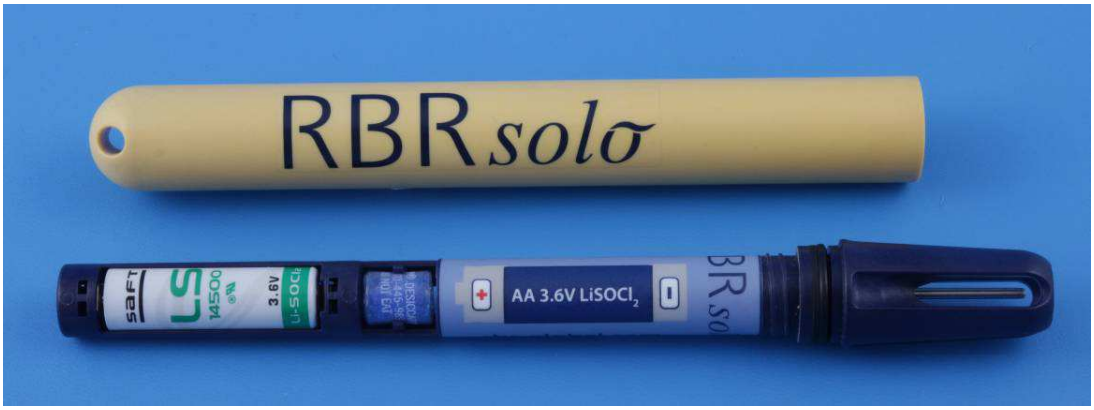


Fig. 1 RBR*solo/duet* sensor carriage and housing

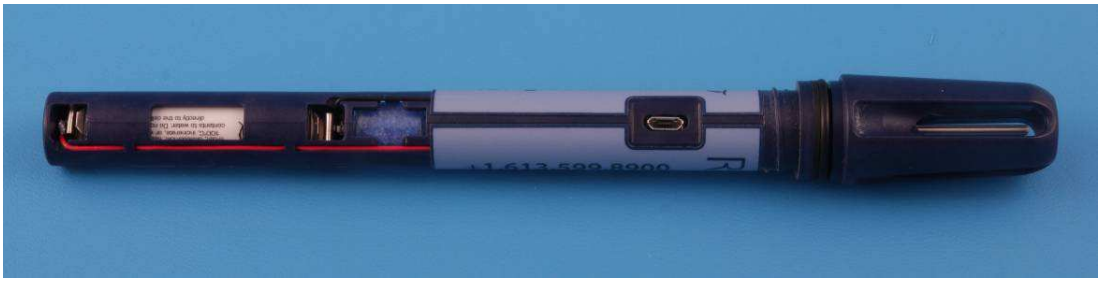


Fig. 2 RBR*solo/duet* sensor carriage, reverse side

Closing the logger is exactly the reverse of opening it. Remember to keep the O-rings clean and avoid scratching the O-ring mating surfaces. Carefully inspect the O-rings, as described in "Inspecting the O-rings" section (p.6), before deploying the logger. Do not use excessive force when tightening the end sensor end; hand-tight is quite sufficient, as the seal depends upon the O-rings, not the end cap tightness.

Changing the batteries

RBR*solo/duet* data loggers are powered by one (1) AA size 3.6V lithium thionyl chloride cell.

IMPORTANT NOTE: The logger will not operate with alkaline or zinc-chloride 1.5V AA batteries, you must use 3.6V lithium thionyl chloride cells. The instrument will also not operate with rechargeable batteries.

RBR recommends using Tadiran brand batteries only (part# TL-5903 or TL-4903) in your RBR*solo/duet*. Generally, lithium thionyl chloride cells sensitive to orientation, and if the logger is placed with the positive end facing downward (logger pointing up), it will suffer from decreased capacity and reduced battery life. Tadiran cells are minimally sensitive to this orientation effect.

To remove the battery, use either your finger or a blunt tool to push the battery from its holder using the keyhole opening (Fig. 3) on the back of the carriage.



Fig. 3 Keyhole opening for battery removal

To insert the battery, press the battery into the battery holder, ensuring it is correctly oriented with the negative terminal placed towards the electronics (Fig. 4 and 5). The label in the logger indicates proper battery placement.



Fig. 4 RBR*solo/duet* battery holder with battery

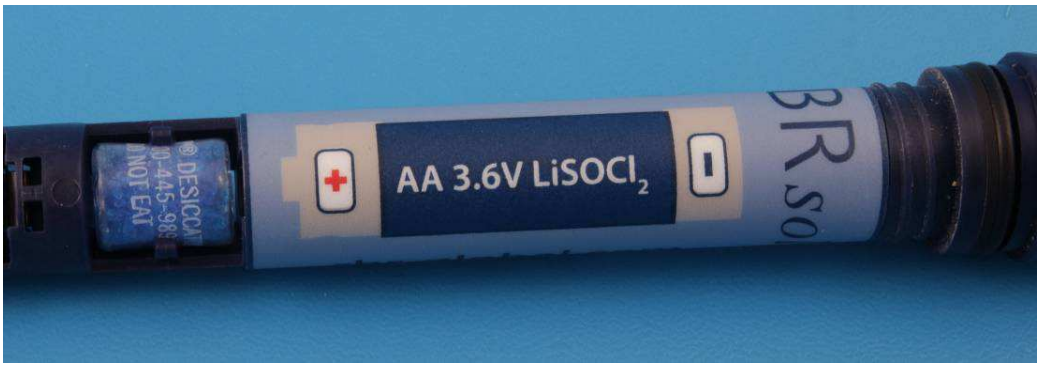


Fig. 5 Battery orientation label

Communicating with the logger

To establish communication between the RBR*solo*/*duet* and a computer, open the instrument and remove the housing. There is a micro-USB connector located on the opposite side of the circuit board (Fig. 6). The supplied interface cable is plugged into this connector.



Fig. 6 Micro-USB connector location

LED Behaviour

Your RBR*solo/duet* has a red LED located next to the USB connector. The LED will flash in various patterns depending on the state of the instrument, as follows:

Action	LED Response
Connect download cable	Lights for one second
Disconnect download cable from programmed logger (either logging or pending)	Blinks slowly for 6 seconds
Click Enable button and confirm memory erase	Blinks rapidly for 6 seconds

Installing desiccant

The RBR*solo/duet* has a dedicated location for placement of desiccant in the sensor carriage, which will accommodate one (1) Dricap desiccant capsule (part # 02-01207AG35).

Insert a fresh desiccant capsule into the desiccant holder, ensuring that it is securely placed. To remove the desiccant, there is a small keyhole opening in the back of the carriage. Simply use your finger or a blunt instrument to push the desiccant from the holder (Fig. 3).

Deployment

Once you have ensured that the batteries are fresh, inspected the O-rings and programmed the logger, the instrument is ready to be deployed. There are three precautions you should take to avoid damaging the logger:

1. Heed the maximum pressure rating of 1700m. This is indicated by the label which is placed on the logger's sensor end cap.

2. Avoid physical stress to the logger. Any type of clamp or bracket which concentrates the stress to the logger body is not recommended for use in logger mooring, mounting, and/or other deployment. Stress due to improper mounting may cause the logger to leak, resulting in the loss of valuable data or permanent damage to the electronics. RBR can provide proper mooring and mounting clamps suited to your specific application.

3. Use desiccant. If the logger is closed up in a warmer environment than the deployment environment, internal condensation can result. Since condensation may cause the circuitry to malfunction, the installation of fresh desiccant prior to deployment is mandatory.

4. Orientation on a mooring. Due to battery capacity potentially being sensitive to cell orientation, it is best to mount the logger with the sensor end facing down when deployed. Even if batteries that are minimally sensitive to cell orientation are used (e.g. Tadiran), it is always good practice to mount the loggers in this manner in the event that any brand of battery is employed.

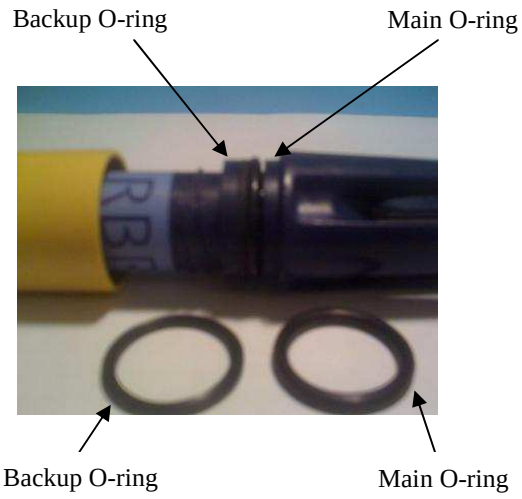
Maintenance and repairs

Support kits

To simplify maintenance of your data logger, RBR supplies support kits with sufficient O-rings, desiccant and silicone grease for 5 deployments. Please contact RBR for more information or to place an order support@rbr-global.com.

O-rings

The single most important item of maintenance on any RBR submersible data logger is care of the O-rings. Any kind of water leak can damage the circuitry beyond repair and cause complete data loss. Every logger's seal depends upon its O-rings, not the end cap tightness. Proper O-ring maintenance, therefore, is crucial. The RBR*solo/duet* uses two O-rings. One is the main O-ring and the other is the backup O-ring. Both O-rings are required to ensure that the logger does not become flooded. The correct placement and orientation of the two O-rings is critical to maintaining depth rating integrity.



The backup O-ring is flat on one side, and grooved on the other. When installing, the grooved side must be located towards the main O-ring (Fig. 7).

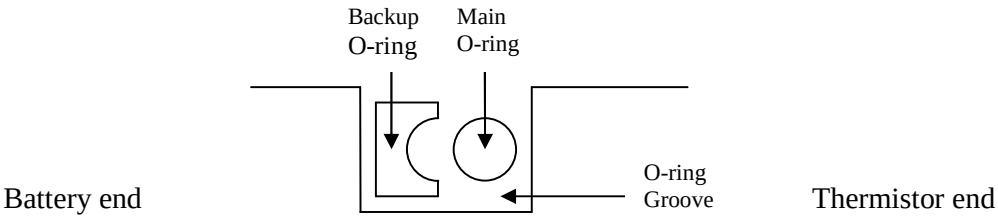


Fig. 7 Backup O-ring orientation

Before you remove the O-rings from the RBR*solo/duet*, make your self familiar with their orientation and location. Inspect the new O-rings provided in the loggers support kit – there are two types. The back-up O-ring is a flat O-ring with a concave channel on one side. The main O-ring is round.

Inspecting O-rings

Give particular attention to the following areas:

- The surface of the O-ring itself
- The mating surface on the inside of the case between the threads and the open end
- The inner surfaces of the groove in the end cap where the O-ring sits

Any dirt present should be removed by wiping thoroughly with a soft, lint-free cloth. When cleaning, never use any material or tool which could scratch the O-ring or any of its mating surfaces. If any dirt is present in the O-ring groove, then the O-ring should be removed as described below to allow thorough cleaning of the groove. If an O-ring needs to be removed for any reason, it should be replaced.

If the O-ring is scratched, cut, distorted, perished or defective in any other way it must be replaced. If any of the surfaces of the O-ring groove are scratched, pitted or otherwise damaged, the logger may need to be returned to RBR for refurbishment: please contact us for advice support@rbr-global.com.

Replacing an O-ring

1. Lever the O-ring from its groove. Use a soft plastic or wood tool; do not use a metal screwdriver or any other tool which may scratch the surfaces of the O-ring groove: doing so will probably render the end cap useless. Slide the O-ring out of its groove and off the logger. The O-ring may need to stretch quite a bit as it is pushed off; this requires some effort but can be done by hand.

2. Thoroughly clean the O-ring groove, taking great care not to scratch or damage it in any way. Inspect it carefully, and contact us for advice if it appears damaged. Apply a light film of silicone grease (part #10-568) to all three inside surfaces of the groove, being careful not to trap any dirt, hairs or lint.

3. Select the proper O-ring and make sure it is not damaged. Lubricate it with a very light film of silicone grease to ease its installation. The correct order and orientation is as follows (assuming the o-rings have been removed): Install the main o-ring first by sliding it over the electronics housing (it is too small to fit over the sensor cap). Install the back up o-ring making sure that the concave part faces toward the sensor end and will mate with the main o-ring. The flat part of the backup o-ring must mate flat with the o-ring backing wall. Make sure there are no twists in either o-ring.

4. When the new O-ring is in place, inspect it once more for scratches and dirt, and wipe away any silicone grease deposited on the end cap.

Many experienced users of oceanographic equipment replace all O-rings before every deployment as a matter of routine. The cost of an O-ring is negligible compared with the cost of the instrument and its deployment. Routine replacement of O-rings, therefore, is cheap insurance.

Repairs

We support all instruments and software that we manufacture. First line support is always available by phone, fax or e-mail. Please contact us immediately if you are experiencing problems with your RBR product. It is very important to contact us before returning your instrument, as some difficulties can be easily solved on-site by the user. Please have the model and serial number of the unit handy when you contact us. support@rbr-global.com

There are no user-repairable parts of the logger. Any attempt at repair, whether successful or not, without prior authorization from RBR Ltd. will void the warranty.

If it is necessary to return the product to RBR for an upgrade, repair, or calibration; please review the detailed shipping information on our website before returning the unit.

Calibration

We recommend that you verify the calibration of your data logger before any critical deployment, periodically once a year, or if you suspect the calibration to be out of specifications. Discuss your calibration needs with RBR. In some cases, you will be recommended to return the instrument to RBR to have it checked and re-calibrated. Please contact us for our current calibration fees.