Salinity Analysis
Portasal 8410A

SOCIB-Research Vessel Facility

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Description:	Salinity samples analysis operating the Portasal 8410A
Authors:	C. Muñoz, I. Lizaran, J. Allen, E. Alou
Supervision:	J. Allen
Involved Personnel:	ETD, Vessel and DC

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CHANGE RECORD

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1.0.0	2018-05-21	First version document	C. Muñoz	J. Allen
1.1.0	2019-05-20	General enhancements, add pictures	C. Muñoz	C. Muñoz
1.2.0	2019-11-27	Add Data backup section and accept other suggestions	C. Muñoz	C. Muñoz

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1. INTRODUCTION

The aim of this document is to describe a standardized procedure to conduct the salinity analysis operating the Guildline Portasal 8410 salinometer.

2. RELATED DOCUMENTS

- User's Manual portasal 8410A
- Portasal 8410A Portasal 8410A Specification sheet
- SPEC_DCF_SOCIB_raw-data-file-naming-convention

3. REQUIRED MATERIAL

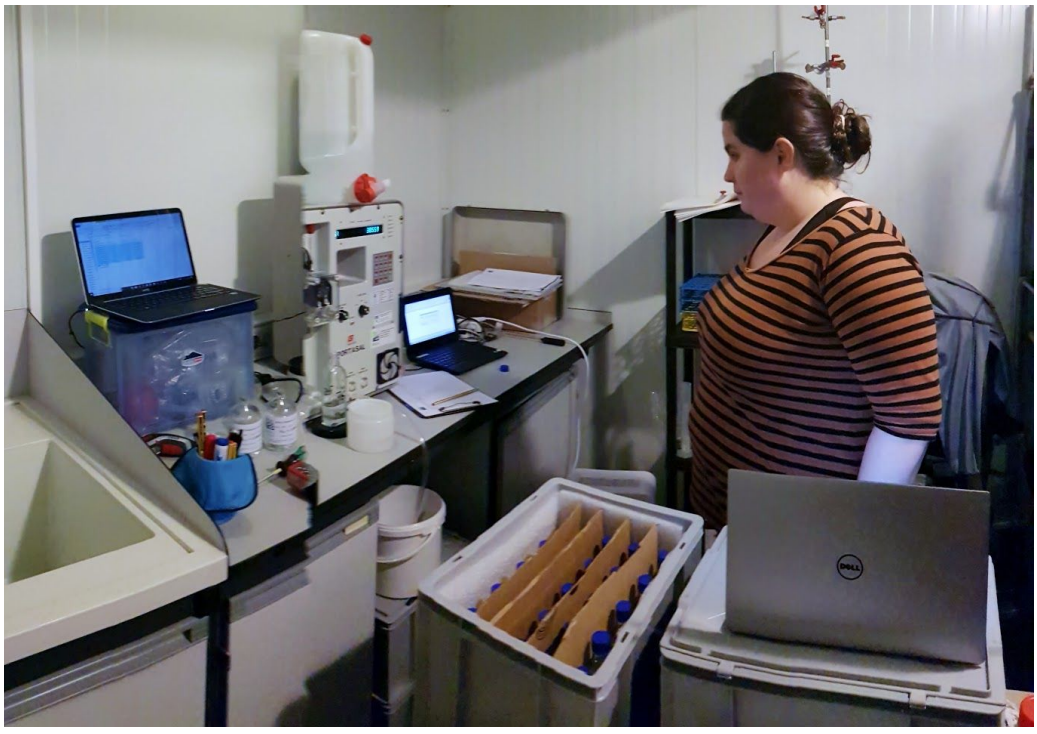
- Portasal 8410A.
- Portasal spares kit.
- Laptop.
- Software salinometer datalogger.
- Thermometer for air temperature.
- Dehumidifier.
- Sea water samples.
- OSIL standard seawater (preferably ~ 35.000 salinity).
- Plain screw driver.
- Distilled water 20L.
- 0.5L Triton cleaner dilution. Triton dilution 0.01% (1 ml Triton/1 L distilled water).
- Paper towel roll.
- CTD logbook.
- Field salinity spreadsheets (filled on board the cruise).
- Laboratory salinity analysis spreadsheets.

4. PROCEDURE DEVELOPMENT

4.1. Prepare controlled temperature room

This stage of the procedure needs to be done 24 hours before the sample analysis.

- Clean the working area.
- Set up the laboratory space: bring salinity standards and salinity samples to the room.
- 24 h before the analysis, switch on thermostat in order to acclimate the room around 23 ºC.
- 24 h before the analysis, switch on dehumidifier in order to acclimate the room around Hr= 50-60 %. Remember to empty the dehumidifier from time to time.
- Track the temperature: perform a one hour check for the temperature in order to control how constant is the temperature in the lab.



4.2. Portasal assembly

- Leave portasal back lead open.
- Connect power supply and data cables.
- Open Portasal main lead and leave distilled water tank above.

- Connect peristaltic pump power supply cable.
- Fill portasal tank with distilled water keeping Portasal switched off. It should be filled in around minutes, when water leaves through the overflow tube.

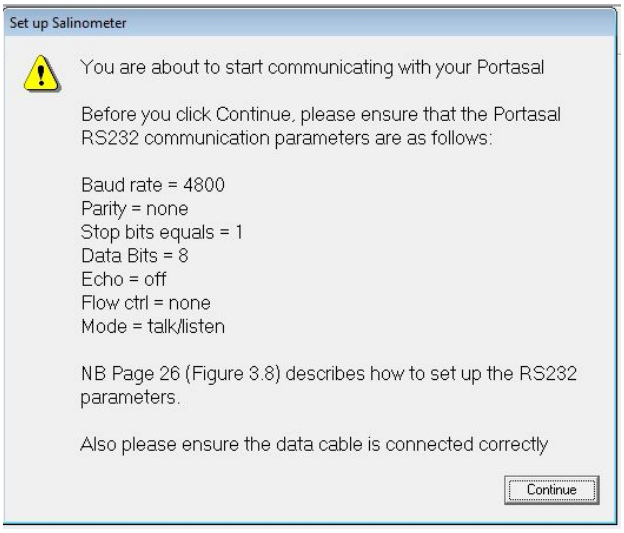
- Once Portasal is full, disconnect overflow tube first to avoid bubble formation. Disconnect tank drain secondly.
- Turn on the Portasal.

- Press button 1 T set.
- Set temperature at 23ºC (must be 1ºC above room temperature).
- Push ENTER.
- Fill portasal circuit with Triton dilution and flush. Repeat this process 10 times.
- Fill portasal circuit with distilled water and flush. Repeat this process until 1L of distilled water is consumed.
- Leave the portasal circuit filled with distilled water.
- Leave the tubes assembled and refill the following day just in case some bubbles were trapped in the tank.
- Leave the portasal turned on.

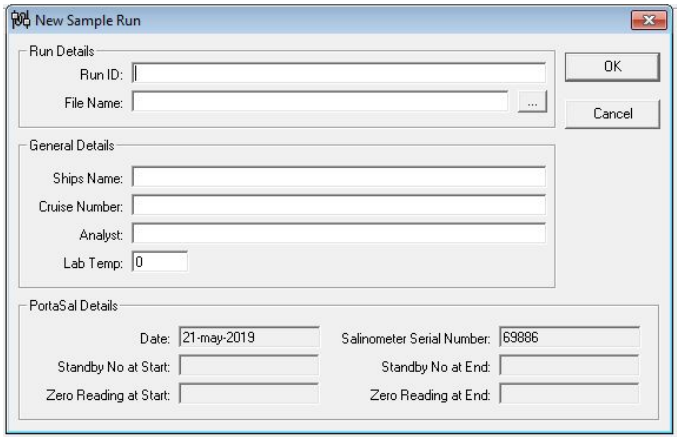
4.3. Prepare file

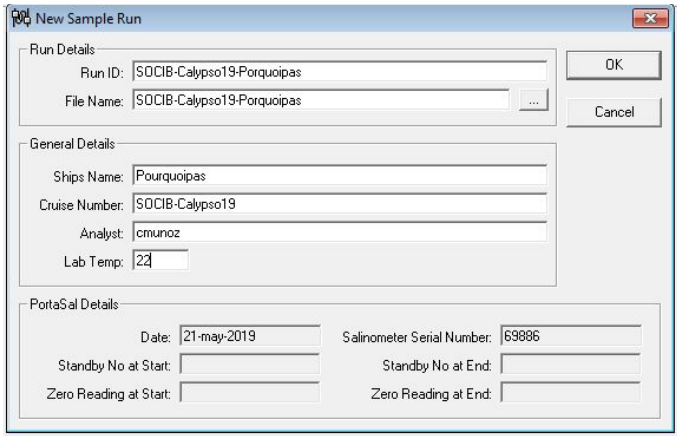
- Switch to Function “standby”.

- Open salinometer datalogger software.
- New file.
- Configure comm settings in case are not as the message.



- New sample run. Fill settings and store in new folder (button with …).



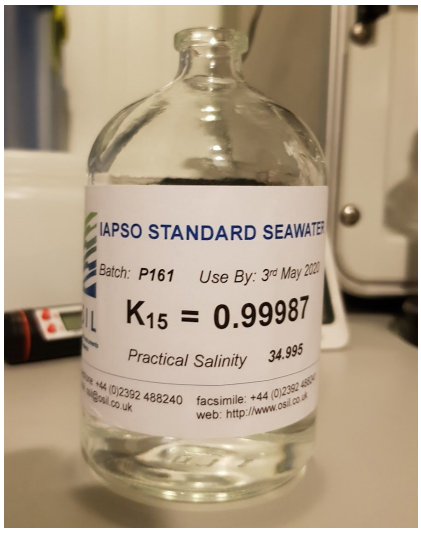


- Press OK.
- Base file extension created will be hdr.
- Switch Function to “zero”.

- Wait zero is measured.
- Switch to Function “standby”.

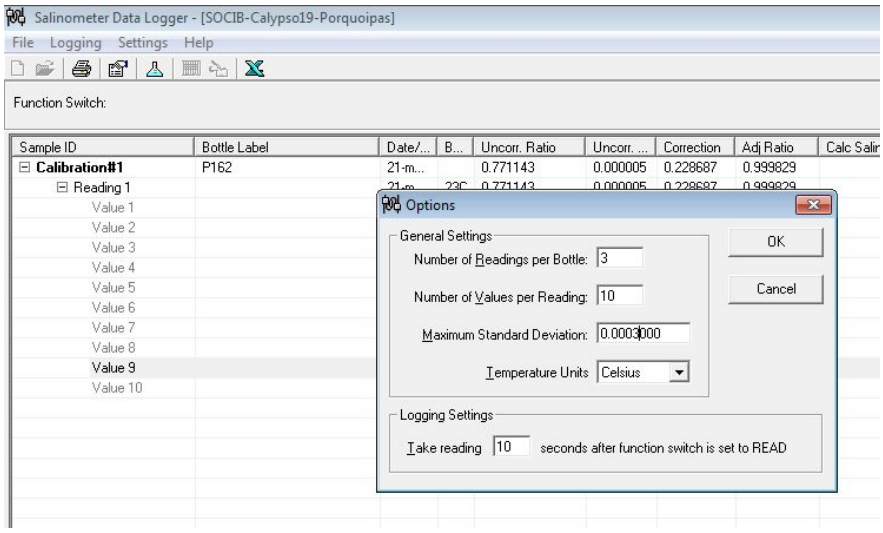
4.4. Standardization

- Be sure that the room is at 21ºC and the portasal 1-2ºC higher than the room temperature.
- Switch to Function “standby”.
- Fill circuit with standard pattern and flush. Repeat the process 3 times.

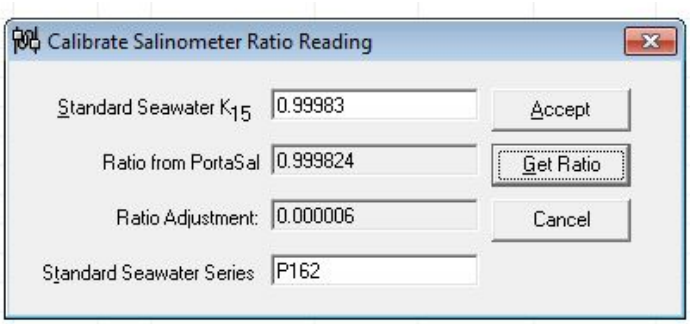


- Function “Read”.
- Press button 9 STD. Press ENTER.
- Wait for measure stabilization. Press ENTER. Ratio must be around 0.99987.

- Software salinometer datalogger std must be around 0.0003 maximum.

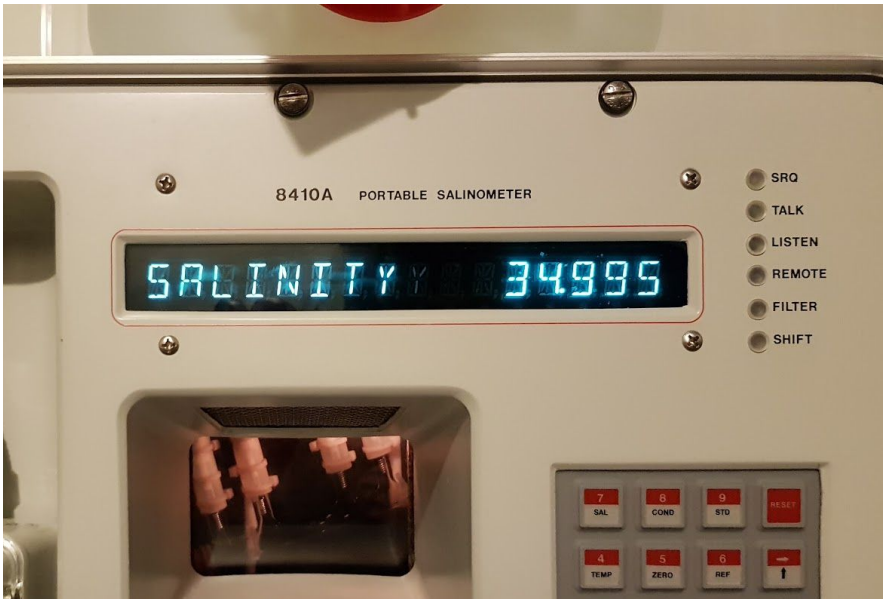


- Run calibration standard in salinometer datalogger software.
- Enter settings pattern and Press Get Ratio.



- Read pattern
  - Switch to Function Read.

  - Press button 7 SAL. Press ENTER (wait 10 sec for measure stabilization + time for 10 measures taken by the portasal).
  - Flush circuit.
  - Repeat reading pattern 3 times.



4.5. Prepare sampling

- Sample homogenization
  - Perform a few simple shakes of the bottle and leave it for 5 minutes.
- Clean portasal circuit with sample
  - Before measuring, flip the flask without generating bubbles.
  - Turn on peristaltic pump.
    IMPORTANT to do it before adding the sample to avoid contaminating it with water contained inside the tube.
  - Clean simple suction tube with paper.
  - Set sample bottle to the tube.

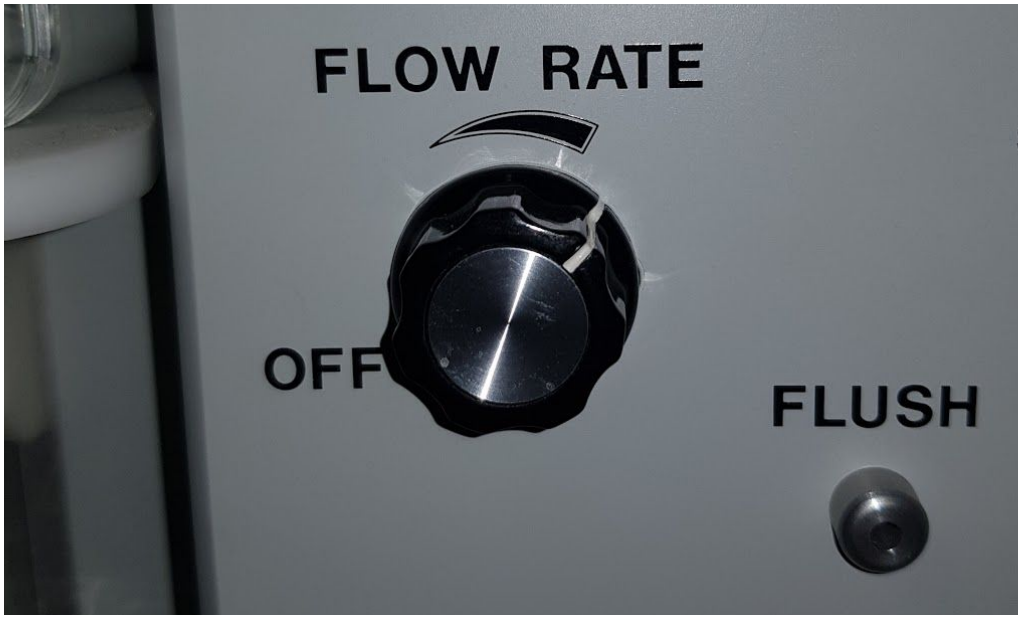
NOTE: The tube mouth mustn't touch any part of the bottle while sucking sample.

- Switch to Function "standby".
- Fill portasal circuit with sample and flush, repeat the process 3 times.

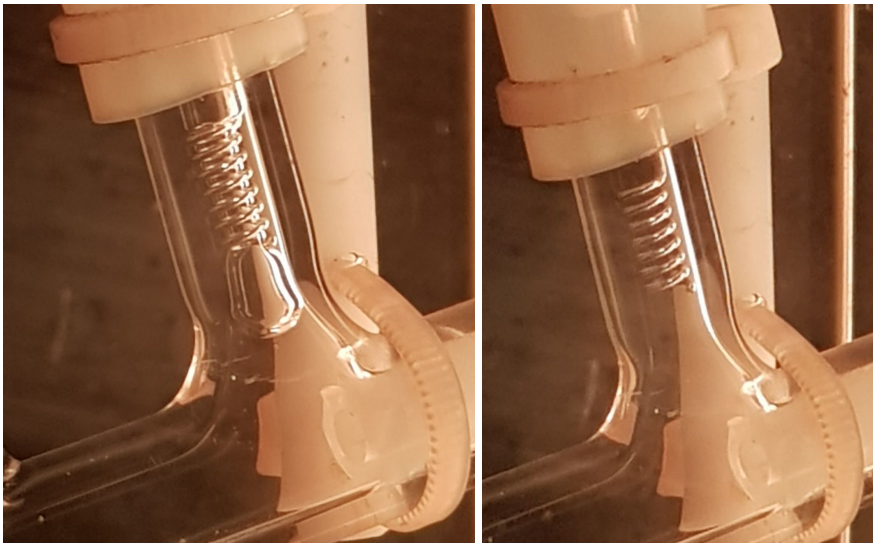
4.6. Sampling process

- Read sample
  - Switch to Function "standby".
  - Turn on peristaltic pump.

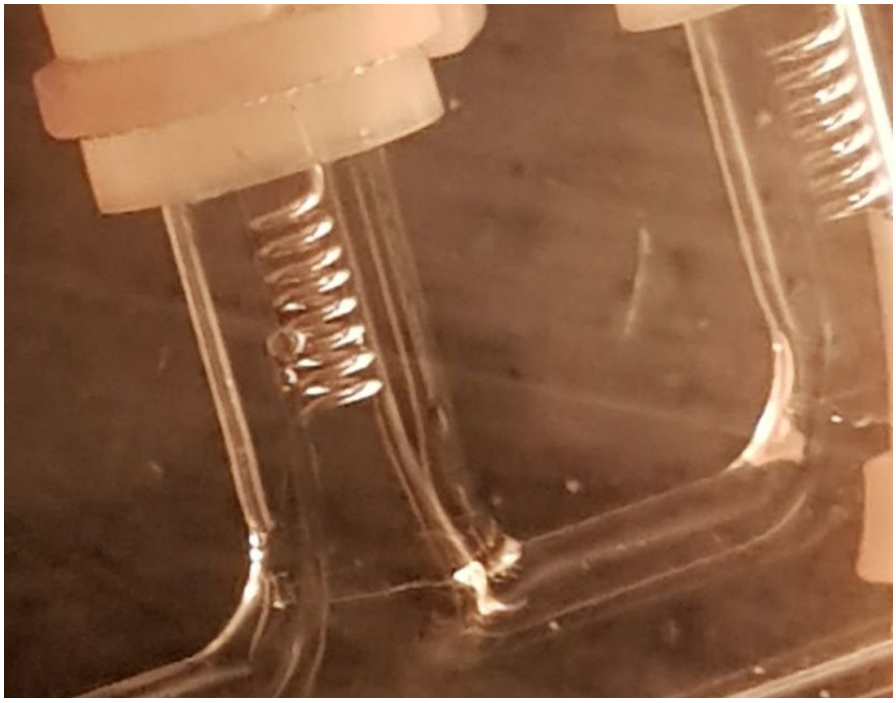
    NOTE: Switch pump to 3 and flow rate to maximum.



- Fill portasal circuit with sample.
- Turn off peristaltic pump.
- Check there are no bubbles in the cell, otherwise flush the cell and refill again until no bubbles.



NOTE: Tiny little bubbles that repeatedly appear may cause insignificant effects in the results.



- Switch to Function “Read”.

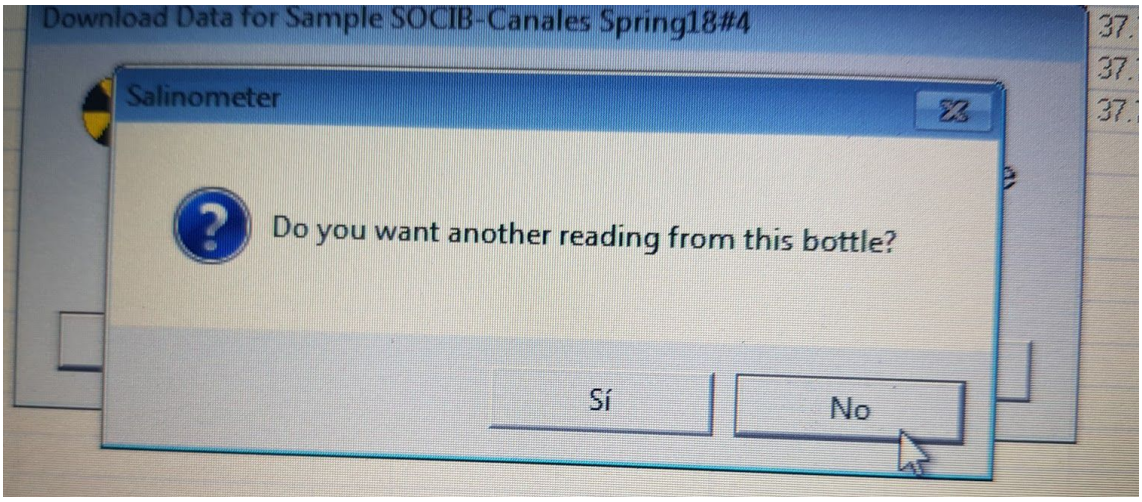
- Press button 7 SAL. Press ENTER (wait 10 sec for measure stabilization + time for 10 measures taken by the portasal).
- Write down reading in Laboratory salinity analysis spreadsheet.

Field names	Type	Size	Example
Number bottle	integer	<4	76
cruise/origin	text	<17	S2_21 B2 (5m)
Date/time analysis	datetime	16	09/05/2018 09:58
Measures portasal (3 readings)	float	6	37.497
Measure average	float	7	37.4972
Temperature of measurement	float	7	23.0024
Comments	text	<1000	Free text to include comments and observations

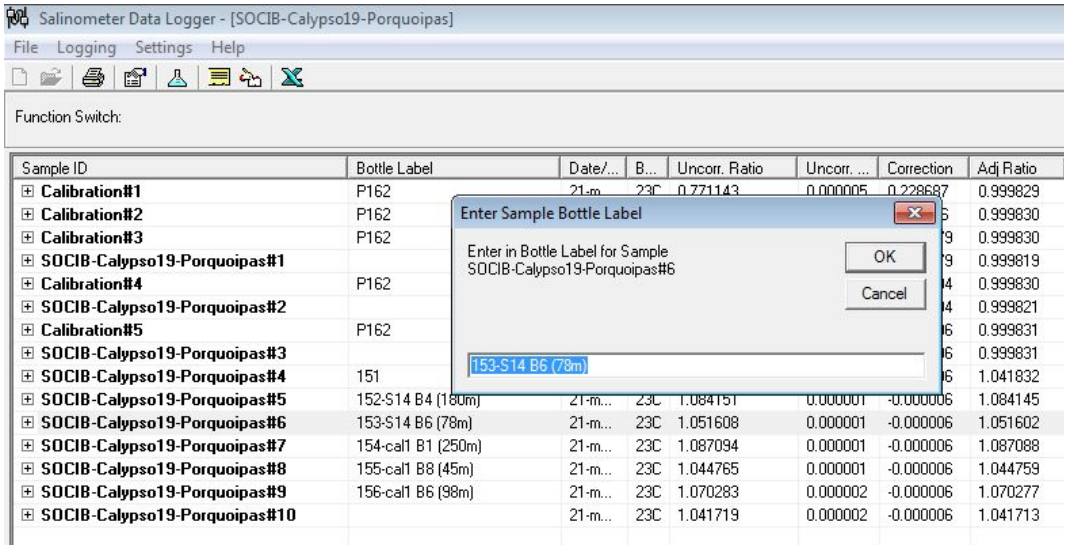
- Switch to Function “standby”.
- Turn on peristaltic pump.
- Flush circuit.
  NOTE: flushing tube mouth mustn’t touch anything at all including water of the flushing tank. Avoid any curvature or twist in the flushing tube.

- Repeat Reading sample 3 times.
  NOTE: in case there are bubbles in the last sample taken, the file reading must be removed from? the? salinometer datalogger software.
- Salinometer datalogger software. Do you want another Reading from this bottle? **Press YES**.
  NOTE: this message appears after running 3 samples.

- Change sample
  - Salinometer datalogger software. Do you want another Reading from this bottle? **Press NO**.
    NOTE: this message appears after 3 samples.



- A new line appear in software. Click on bottle label field and enter bottle label information with number bottle + cruise/origin from the Laboratory salinity analysis spreadsheet (e.g. 52-RDM_01 B2(55m)).



Sample ID	Bottle Label	Date/...	B...	Uncorr. Ratio	Uncorr. ...	Correction	Adj Ratio
Calibration#1	P162	21-m...	23C	0.771143	0.000005	0.228687	0.999829
Calibration#2	P162						0.999830
Calibration#3	P162						0.999830
SOCIB-Calypso19-Porquoipas#1							0.999819
Calibration#4	P162						0.999830
SOCIB-Calypso19-Porquoipas#2							0.999821
Calibration#5	P162						0.999831
SOCIB-Calypso19-Porquoipas#3							0.999831
SOCIB-Calypso19-Porquoipas#4	151						1.041832
SOCIB-Calypso19-Porquoipas#5	152-S14 B4 (180m)	21-m...	23C	1.084151	0.000001	-0.000006	1.084145
SOCIB-Calypso19-Porquoipas#6	153-S14 B6 (78m)	21-m...	23C	1.051608	0.000001	-0.000006	1.051602
SOCIB-Calypso19-Porquoipas#7	154-cal1 B1 (250m)	21-m...	23C	1.087094	0.000001	-0.000006	1.087088
SOCIB-Calypso19-Porquoipas#8	155-cal1 B8 (45m)	21-m...	23C	1.044765	0.000001	-0.000006	1.044759
SOCIB-Calypso19-Porquoipas#9	156-cal1 B6 (98m)	21-m...	23C	1.070283	0.000002	-0.000006	1.070277
SOCIB-Calypso19-Porquoipas#10		21-m...	23C	1.041719	0.000002	-0.000006	1.041713

- Turn on peristaltic pump without sample.
- clean suction tube.
- Add the next sample immediately.
- Get back to “Prepare sampling” stage.
- Get back to “Sampling” stage.

4.7. Sampling Stand-by

- Should the process needs to be interrupted for more than 5 minutes, fill the circuit with distilled water.

4.8. Sampling end

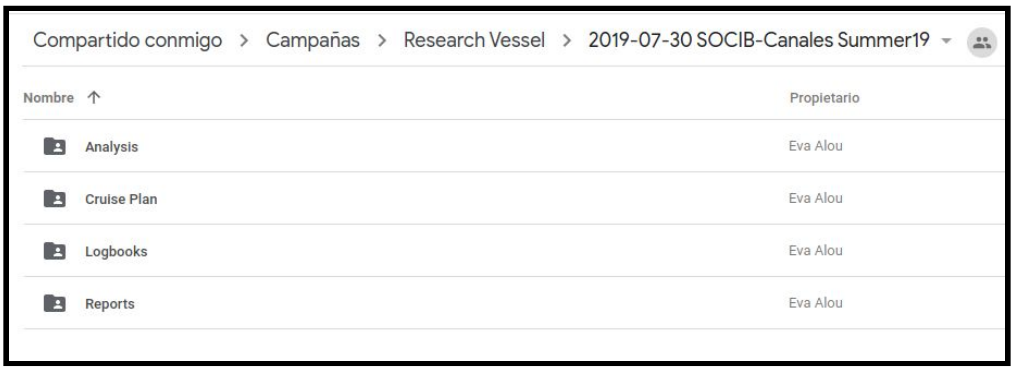
- Run the standard as if it was a sample and check whether there is a drift from the beginning.
- Switch Function to “zero”.
- Close file in salinometer datalogger software.
- Clean the circuit with distilled water. Repeat the process 3 times.

- After the third flush, fill the circuit with distilled water and leave it filled.

- Switch off portasal.
- Empty portasal water tank.
- Backup the data.
- Open file in salinometer datalogger software.
- Export excel sheet.

4.9. Data backup

- Ensure data is properly stored in gdrive > Campañas > Research Vessel > CruiseName > Analysis > Salinity.



- A final copy of the xlsx file needs to be stored in the following directory: /socib/raw/DT/vessel/LABORATORY/SAL/

  NOTE: The final copy needs to be renamed according in accordance with the SPEC_DCF_SOCIB_raw-data-file-naming-convention.