

IOP 006.5  
Effective Date: 1/09/2017  
Replaces IOP 006.4  
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Canada

## **INSTRUMENT OPERATING PROCEDURE**

### **INSTRUMENT:**

Parameter Actuator Logger (PAL)

### **MODEL:**

PAL 1101 and 1110

### **MANUFACTURER:**

ISCO

### **PRECAUTIONS:**

#### **POTENTIAL INTERFERENCES:**

Assure that there are no bubbles in the probe, shake down if bubbles are seen.

Assure that the probe is free from scratches or organic build-up.

Store the pH probe wet in pH 4.0 buffer for long periods.

Do not cross or touch lines while calibrating instrument

#### **SAFETY:**

No special safety precautions

**PROCEDURES:**

- I. Preparing the unit
  - A. Connect the pH electrode to the terminal on the pH meter.
  - B. Attach the battery to the PAL.
    1. Assure that the battery is charged
    2. Check that all connections are tight.
- II. Calibrating the unit
  - A. The following messages appear briefly on the PAL display when activated:  
  
SOFTWARE REV. XXX  
  
pH 4.56 TEMP 21.5 C  
11:22 DISABLED  
  
STANDBY - PRESS RUN  
KEY TO START PROGRAM
  - B. Rinse the pH probe and place in 7.0 pH buffer solution. At least one inch of the stainless steel probe body must be in the pH buffer for the probe to calibrate correctly. Do not hold, touch, or place your body within 10 inches of the probe until you have completed the calibration. Press the CAL button on the PAL 1110. The following appears on the display:  
  
USE < OR > TO SELECT  
AND ENTER TO ACCEPT
  - C. After a few seconds the display advances to the following message:  
  
CALIBRATE XX/XX/XX  
EXIT < OR > CONTINUE
  - D. Press the orange ENTER button on the PAL; the following message appears:  
  
RINSE PROBE-PLACE IN  
7.0 BUFFER
  - E. The display then shifts to the following:  
  
CURRENT PH X.XX  
ENTER WHEN STABLE
  - F. Press enter when the number stabilizes. The following message then appears:  
  
RINSE PROBE-PLACE IN  
4.0 BUFFER

- G. Rinse probe and place into a beaker of 4.0 buffer solution. The following display appears:

CURRENT PH X.XX  
ENTER WHEN STABLE

- H. When pH stabilizes at about 4.0, press ENTER. The following message appears briefly:

CALIBRATION COMPLETE

- I. The display then advances to the following message:

STANDBY-PRESS RUN  
KEY TO START PROGRAM

- J. Press the red RUN key and the display responds with:

PH X.XX TEMP XX.X C  
XX:XX DISABLED

III. Accessing the operating menu.

- A. Press the black MENU button on the PAL; the following message appears:

USE < OR > TO SELECT  
AND ENTER TO ACCEPT

- B. The display then changes to:

ID CLOCK SAMPLE MODE  
DATA INTERNAL EXIT

- C. When the letters "ID" flash press ENTER. The display advances to:

ENTER ID NUMBER

- D. Enter a number of ten or fewer digits. Press ENTER and the display advances to:

ID CLOCK SAMPLE MODE  
DATA INTERNAL EXIT

- E. Press the > key. The word CLOCK begins to flash and the display advances to:

DATE XX/XX/XX  
TIME XX:XX

- F. Enter the date and time with the number keys. Press enter; the display then reads:

ID CLOCK SAMPLE MODE  
DATA INTERVAL EXIT

- G. Select sample mode. The choices are “ENTIRE PROGRAM” or “ONLY DURING EVENT”.

Select ENTIRE PROGRAM to ensure all data is recorded and press ENTER. The display reverts to:

ID CLOCK SAMPLE MODE  
DATA INTERVAL EXIT

- H. Press the > to select “DATA INTERVAL”; the display begins to flash. Press ENTER; the display then reads:

DATA INTERVAL IN MIN  
1 2 5 10 15 30 60

- I. Select the desired number with the > key and press ENTER. The display reverts to:

DATA LOGGING  
SLATE ROLLOVER RESET

- J. One display flashes. Use the > key to select ROLLOVER and reset. This allows collection of 2,600 readings and clears the memory of past data sets. Press ENTER; the display reads:

SELECT PRINTOUT  
SAMPLER ALL ON LINE

- K. Select ALL to print all data in the memory. After the selection is made, the display reverts to:

ID CLOCK SAMPLE MODE  
DATA INTERVAL EXIT

- L. Select the word EXIT with the > key. Press ENTER, the display reverts to normal:

STANDBY - PRESS RUN  
KEY TO START PROGRAM

- M. This completes the set up and calibration procedure. Rinse the probe thoroughly and place the probe in the stream. Assure that the probe is suspended in the water column and that the location has adequate flow. Press the RUN key.

IV. Deploying the unit

- A. Situate the unit at a site out of open view.  
B. Secure the unit to a tree with a cable and lock.  
C. Make required entries in the log book.

V. Downloading data from the PAL

- A. A laptop computer is used in the field to download the data from the PAL.
- B. Connect the PAL to the computer with a 9-pin serial port connector (on the back of the laptop computer).
- C. Double click on the SAMPLINK icon.
- D. Select COM.PORT 1.
- E. The data then is downloaded to the hard drive of the laptop.
- F. A message is displayed at the bottom of the screen which describes the storage of the file.
- F. The file is then brought into a word processing program, edited, renamed, and printed.

**MAINTENANCE:**

All sensors are shipped with the measuring end covered with a wetting cap. Sensors are stored in a pH 4 buffer solution when not in use. Vertical storage is recommended to prevent leakage of the buffer solution from the wetting cap.

A number of other maintenance and trouble shooting procedures are described in the instrument and sensor instruction manuals: Parameter Actuator Logger PAL 1110, part #60-1113-019

**REFERENCE**

Instruction manual for the Parameter Actuator Logger PAL 1110 and 1101

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This procedure has been reviewed and approved by the undersigned representative of Fisheries and Oceans Canada.

REVIEWED/APPROVED Mike Stevens DATE 05 MAR 2020  
Program Manager (Canada)