

# PRE-DEPLOYMENT OPERATIONS OF A PROVIO II FLOAT

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## 1. Introduction

The ProvBio II float (Figure 1) is a sub-surface profiler that can be equipped with several sensors to collect measurements of different parameters of the water column, at 1 meter vertical resolution, like:

- salinity
- temperature
- depth
- dissolved oxygen
- chlorophyll a
- CDOM
- irradiance  $E_d$  (380, 412, 480 nm), PAR
- backscattering (530 nm)
- attenuation coefficient (660 nm)
- nitrate

The aim of this technical report is to describe the pre-deployment operations of the ProvBio II that includes a check for the transmission and a procedure to verify/modify the mission parameters.

## 2. Setting the communication

The communication with the platform is made via the Bluetooth (BT) technology. A detailed explanation of the procedure is given in Gerin and Bussani (2013) and in the PROVOR ProvBio II - UTI user manual (2013). In brief, the BT communication is activated by placing the magnet on "Bluetooth ON", just below the ON/OFF position (see Figure 1). To avoid that the mission starts, the magnet must be placed immediately on the BT ON position.

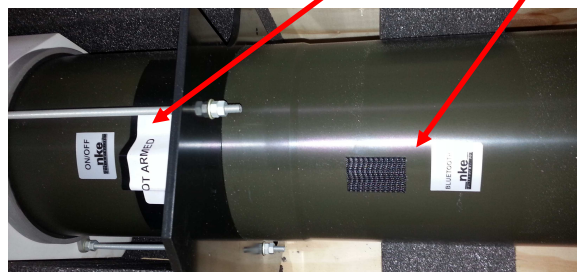
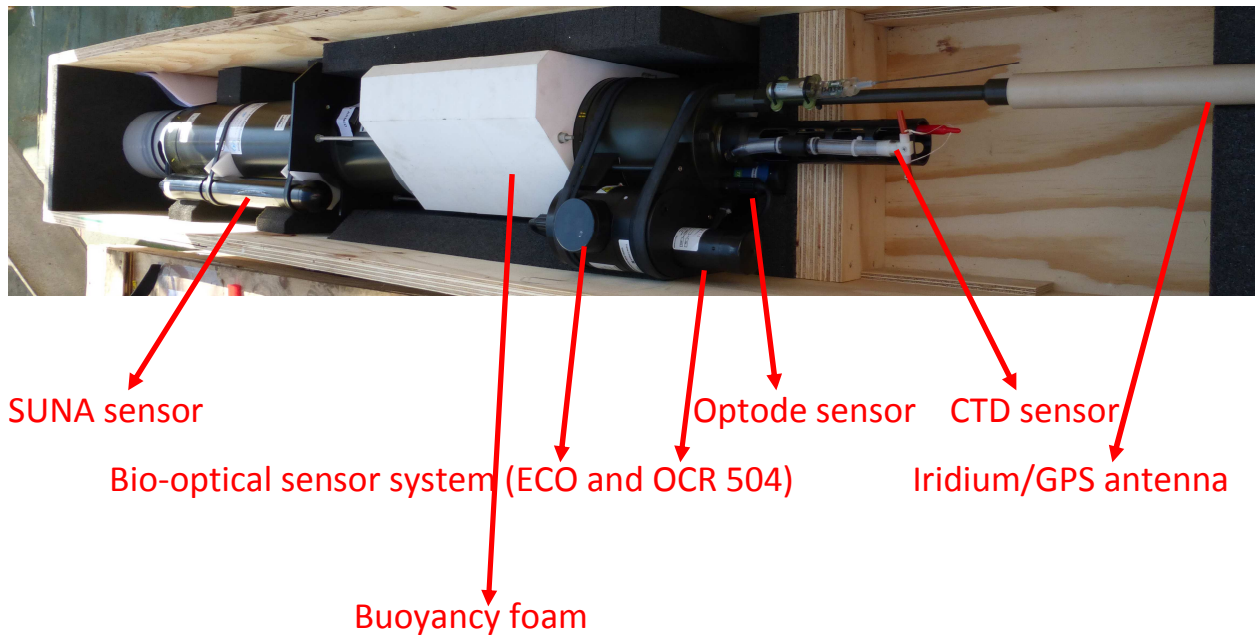


Figure 1. PROVOR ProvBio II profiler: schematic view of the main components/sensors. The "ON/OFF" and the BT positions are shown as well as the Serial Number, the BT code, the SIM number and the RUDICS login.

Once the BT configuration is checked the connection can be activated. A terminal emulator software (e.g. Tera Term, an open-source free software) is used to communicate with the platform and the selected serial port has to be configured properly.

Before sending commands to the float the user has to type the "*enter*" key in the terminal emulator and a log file can be created selecting "*File --> log*" in the menu list box.

An exhaustive list of commands can be found in the PROVOR ProvBio II - UTI user manual (2013): any command is sent to the float by pressing the "*enter*" key.

### 3. Read and change the parameter values

In order to read a parameter, a user has to type the character "?"; to change a parameter the command is "!". Hence, the mission parameters of the ProvBio II can be read in this way:

**?PM** --> mission parameters

**?PI** --> Iridium/Rudics parameters

**?PT** --> technical parameters

**?PV** --> vector parameters

**?PC** --> sensor parameters

all the parameters are read by typing:

**?RP**

and for other parameters:

**?NS** --> serial number

**?TI** --> time

**?VB** --> internal vacuum and battery voltage

**?ME X** --> sensor test, where "X" is the sensor

The float has to be armed before the deployment and to verify this condition the command to use is **?AR** (answer can be 0 or 1 for NOT ARMED and ARMED, respectively).

#### 4. Test of the connection to the server

The float answer to the command **?PI** could be something like "ogsbio002b" that is the identifier (RUDICS login, for example) used for the communication. If needed, a new identifier can be created (on the Jaguar-network, based in Marseille, France) typing the command:

**!PI 1 identifier** (identifier could be "ogsbio002c", for example).

The directory for the data storage corresponding to the identifier must exist and it has to be placed at <http://www.oao.obs-vlfr.fr/bioargo/PHP/>.

#### 5. GPS and Iridium test

The float must be placed outdoor in upright position to test the GPS and Iridium communication; the command to send is **!SE**. The float checks first its location and then it performs the communication test. A message is sent by the float at <http://www.oao.obs-vlfr.fr/floats>, but this action could take time. As soon as the

test is concluded, a "end session" message should appear in the BT communication window.

## 6. Dump of the configuration

The last step of the pre-deployment operations consists of doing the dump of the configuration in order to make a record of the system. The latter is done by launching the following series of commands:

**!kv 1234** --> to lock and unlock protected commands

**!kc 1234** --> to lock and unlock protected commands

**?TI**

**?NS**

**?VL** --> software version

**?vb**

**?sh** --> show mode state

**?sp**

**?sm**

**?ar**

**?RE** --> read the last reset date and time

**?PM**

**?PV**

**?PT**

**?pi**

**?PC 0** --> request sensor parameter for sensor 0 (CTD)

**?PC 1** --> request sensor parameter for sensor 1 (Optode)

**?PC 2** --> request sensor parameter for sensor 2 (OCR504)

**?PC 3** --> request sensor parameter for sensor 3 (ECO3)

**?PC 4** --> request sensor parameter for sensor 4 (FLNTU)

**?PC 5** --> request sensor parameter for sensor 5 (cROVER)

**?PC 6** --> request sensor parameter for sensor 6 (SUNA)

**!ch** --> measure board auto-test

**?me 0**

**?me 1**

**?me 2**

**?me 3**

**?me 4**

**?me 5**

**?me 6**

**!kc1234**

**!kv 1234**



## 7. Checking the float transmission

Once all the tests and changes are done and the configuration is checked and dumped, the float can be switched off by putting the magnet in the "ON/OFF" position (see Figure 1). The float must be placed in the upright position and outdoor and the magnet should be removed. After the magnet removal the operator should hear 5 "short" clicks immediately: this means that the float is armed. After 3-10 minutes the operator should hear other 5 clicks (longer than the previous ones). The float can be deployed only if the two series of clicks are heard (more deployment information in the "Deployment procedure" technical document usually found in the float box). A first message is sent by the float and a second message (containing the technical packet) is sent after a short time: the operator can check the messages at "<http://www.oao.obs-vlfr.fr/floats>" clicking on the login float number and then on "COM" in order to verify the communication with the Jaguar server. In case the second series of clicks is not heard, the operator can perform a test launching the command **!G** (the connection should be first closed before placing the magnet in the ON/OFF position and then start again the BT connection).

To interrupt the procedure without the deployment, place again the magnet in the "ON/OFF" position, then remove the magnet and place it again to switch off the float after the first "click" and before the fifth "click".

The operator should also check that the external bladder is full of oil before the deployment. The internal vacuum must be between 600 and 800 mbar for the ProvBio II float (a value of 700 mbar is recommended). The procedure to fill in the bladder is described in Gerin and Bussani (2013) and in the PROVOR ProvBio II - UTI user manual (2013).

The last step consists in saving the log file, if created.

## References

Gerin R. and Bussani A., 2013. How to test the Arvor C, to program a mission and to check it before the deployment. Rel. OGS 2013/49 OCE 24 MAOS

PROVOR ProvBio II - UTI user manual, 2013. Doc 04/09/13 rev. 3