

# OPERATOR'S MANUAL

## MULTIPLEX SOFTWARE



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### **About this manual**

This manual will serve as a guide to you when you use the Multiplex software and the associated multiplex deck unit.

- ❖ Use it to understand the purpose of each of the Multiplex system components and functions.
- ❖ It will help you to understand the Multiplex system behaviour.
- ❖ It will serve you as a reference when some problems arise when using the Multiplex system.

### **Software updates and technical support**

Please visit our website download area for software updates and technical support: <http://www.idronaut.it>

### **Warranty**

The Multiplex System Deck Unit and software are covered under a one-year limited warranty that extends to all parts and labours and covers any malfunction that is due to poor workmanship or due to errors in the manufacturing process. The warranty does not cover shortcomings that are due to the design, nor does it cover any form of consequential damage as a result of errors in the measurements. If there is a problem with your IDRONAUT Multiplex System, first try to identify the problem by following the procedure outlined in the troubleshooting section of this manual, if any. Please contact your representative or IDRONAUT S.r.l. if the problem is identified as a hardware problem or if you need additional help in identifying the problem.

**Please make sure to contact IDRONAUT S.r.l. to obtain the relevant instructions before the Multiplex Deck Unit or any module is returned to IDRONAUT (see cleaning instructions).**

For systems under warranty, IDRONAUT S.r.l. will attempt to ship replacement parts before the malfunctioning part is returned. We encourage you to contact us immediately if a problem is detected and we will do our best to minimize the downtime. Every effort has been made to ensure the accuracy of this manual. However, IDRONAUT S.r.l. makes no warranties with respect to this documentation and disclaims any implied warranties of merchantability and fitness for a particular purpose. IDRONAUT S.r.l. shall not be liable for any errors or for incidental or consequential damages in connection with the supply, performance or use of this manual or the examples herein. The information in this document is subject to change without notice.

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The recycling bin symbol on the product or on its packaging indicates that this product must not be disposed of with your other waste. It is your responsibility to dispose of your waste equipment by handling it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your waste disposal service.

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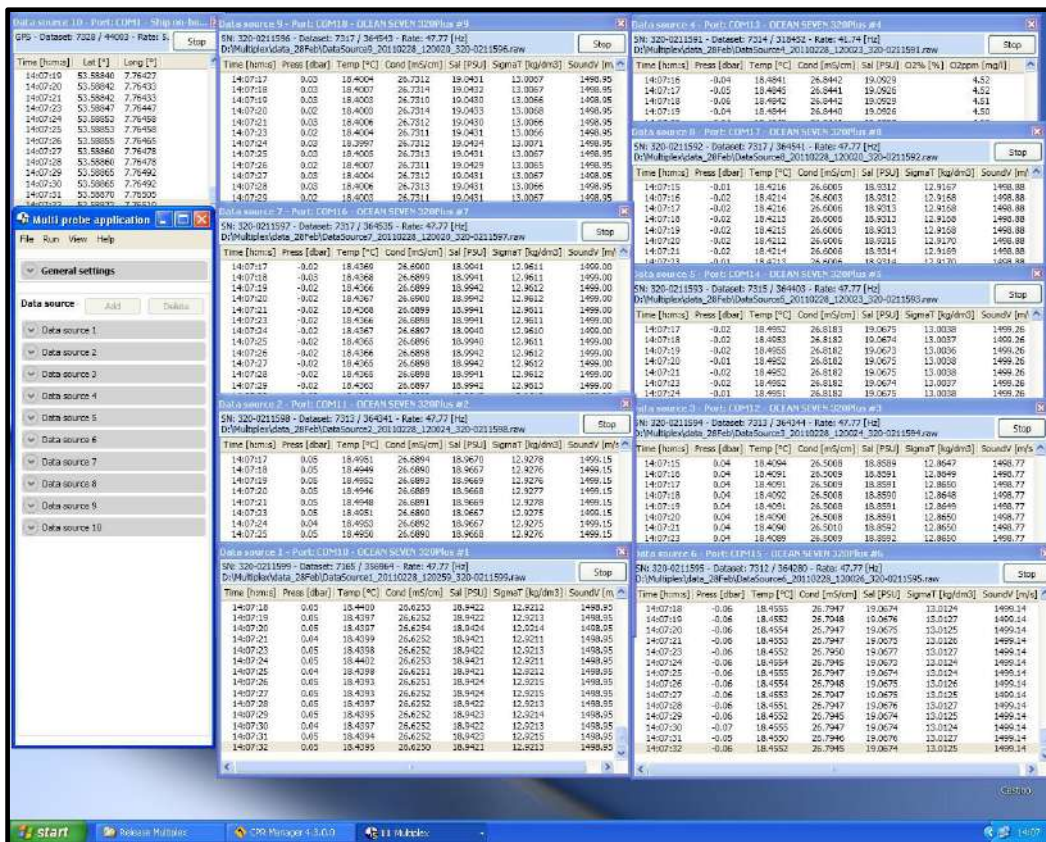
# 1. INTRODUCTION

The IDRONAUT OCEAN SEVEN 3xx CTD multiparameter probes, while deployed in water, acquire and send real-time acquired data to a remote PC. The “Multiplex” allows the deployment of up to 9 OCEAN SEVEN 3xx CTDs contemporaneously. The “Multiplex” is a special data acquisition software running under any Windows 32 and 64 bit Microsoft operating system. The aim of the Multiplex program is to provide the simultaneous real-time data acquisition from all the OS3xx CTDs connected to the PC running the “Multiplex”.

“Multiplex” shows, acquires and stores acquired data in binary files which can be later imported easily in the REDAS-5 program to carry out the data post-processing, extraction, plotting and conversion in text files. Through “Multiplex” only a sub-set of acquired data is shown in real time. The purpose of “Multiplex” is the data collection from a number of OS3xx CTDs and not the data presentation in real time. All data received at the CTD maximum sampling rate is stored in the “Multiplex” binary files even if only few data sets are shown in real time for each CTD. Afterward data is imported in REDAS5 and then it is possible to visualize and post-process all the acquired data.

## 1.1. OCEAN SEVEN 3XX CTDs

The OS3xx CTDs must be connected to the computer running the “Multiplex” by means of the multi-conductor polyurethane submersible cables. Through the multi-conductor deployment cable, the OS3xx CTDs receive the power needed to operate and communicate with the “Multiplex” in real time. Special remarks on the OS3xx CTDs connected to the “Multiplex” is contained in the Operator’s Manual and condensed guide which can be found on the MULTIPLEX CDROM. Obviously the PC running “Multiplex” must be equipped with multiple RS232C interfaces.



## 2. Start-Up operations

The described start-up procedure implies that the Multiplex, ITERM and REDAS5 programs have been already installed in the personal computer.

### 2.1. FIRST TIME START-UP

The step-by-step first set-up after the installation is below described:

1. Run the ITERM program.
2. Connect an OS3xx CTD to the PC RS232C port.
3. Switch on the OS3xx CTD using the CTD top cover on/off rotary switch.
4. OS3xx CTD start-up messages must appear on the ITERM window.
5. Try to control the operations of the CTD through the ITERM and configured connection.
6. Repeat the above sequence of operations for all the OS3xx CTDs, changing each time the communication port number in the ITERM program.

Note: *Multiple instance of ITERM may run all together associated to different communication ports.*

### 2.2. DAILY START-UP

Here are the minimum operations needed to start a deployment of the OS3xx CTDs.

#### 2.2.1. Start a deployment

1. Connect the OS3xx CTDs to the RS232C com. ports.
2. Switch on the OS3xx CTDs positioning the CTD rotary switch on ON.
3. Deploy the OS3xx CTDs in water.
4. Run the “Multiplex” program.
5. Using the “General Setting” configuration, create a new data folder to store acquired data.
6. Enable and/or disable the data sources (OS3xx and GPS) which are not connected to the PC.
7. Check the configuration according to the on-going deployment and start the acquisitions using the RUN command.

**Note:** *It may be possible that one or more OS3xx CTDs are not immediately initialized after the “START” acquisition command has been sent from “Multiplex”. In this case, a red message appears on the data window header (see dedicated section). The “RESTART” button on the data window may be used to carry out another attempt to initialize and start the CTD acquisition. Before pushing the “RESTART” button, please always verify that the communication port associated with the OS3xx CTD is correct.*

*If the OS3xx CTDs are equipped with dissolved oxygen or pH sensors, it is a good practice to carry out a sensor calibration before starting the deployment. Details about the deployment can be found in the OS3xx CTDs Operator’s Manual. From time to time, it is a good practice to carry out a pressure sensor offset calibration (see the details in the OS3xx CTDs Operator’s Manual).*

#### 2.2.2. End a deployment

1. Stop acquisition on the “Multiplex” program. Please be aware that, after the data acquisition has been stopped, it is not possible to close the “Data Source” windows. The “Data Source” windows are closed when the “Multiplex” program is closed or when a new acquisition starts. The “Data source windows” may be closed just before hitting the stop command by means of the “Close All Windows” function available under the “View” menu.
2. Switch off the OS3xx CTDs using the top cover rotary On/Off switch.
3. Import acquired data in REDAS-5 as described in the section dedicated to the REDAS-5 program.

### 3. PROGRAM INSTALLATION

This section describes the installation procedure of the programmes distributed with the IDRONAUT MULTIPLEX CDROM. All programmes are needed to properly operate “*Multiplex*” and can be installed in any sequence. They are:

- ITERM
- REDAS-5
- MULTIPLEX



**IDRONAUT MULTIPLEX AND REDAS-5 PROGRAMMES ARE NOT PROTECTED AGAINST MULTIPLE INSTALLATIONS. MULTIPLEX AND REDAS-5 ARE PROTECTED IN SUCH A WAY THAT THEY CAN BE ONLY USED WITH THE AUTHORIZED OS3xx CTDs.**

#### 3.1. DISTRIBUTED PROGRAMMES

The “MULTIPLEX” CDROM contains folders dedicated to each of the above programs. Each folder contains the needed set-up files.

##### CDROM contents:

Multiplex: Multiple CTD and simultaneous Real-time Data Acquisition program.  
 ITERM: OS3xx CTDs maintenance and communication program.  
 REDAS5: CTD Real-Time Data Acquisition and data post-processing program.  
 Literatures & Manuals: IDRONAUT Operator’s Manual, documents etc..

#### 3.2. PC MINIMUM CONFIGURATION

The personal computer needed to run the “*Multiplex*” must have the following **minimum characteristics**: 2GHZ Dual Core Intel Processor; 3/4GByte RAM; 128GByte HDD; RS232C Com Ports; CD/DVD RW unit; 22” colours LCD display; High performances video board, 32 or 64bit Windows Operating system.

#### 3.3. ITERM

Copy from the CDROM the “Terminal Emulation” folder to the personal computer hard disk drive. A shortcut on the desktop can be created pointing to the ITERM.EXE program in the “Terminal Emulation” folder:

Terminal Emulation folder containing:

```

  ITERM.EXE
  ITERM.RTF
  |----->Tools sub-folder
  INTERPOLATE.EXE
  SWPC.EXE
  OS3XXPROBEAUTONOMY.EXE
  
```

#### 3.4. REDAS5

Identify and run the “SETUP.EXE” program from the “REDAS5” folder on the CDROM. Follow the on-screen instructions during the installation.

A shortcut on the desktop can be created pointing to the REDAS5.EXE program in the “Program\IDRONAUT\REDAS5” windows folder. A dedicated entry in the program menu will be automatically created.

Windows\Programs\Itronaut\Redas5 folder containing:

REDAS5.EXE  
 Redas5.ico  
 Splash.bmp  
 Alarm1.wav  
 Pause.bmp  
 Readme.rtf  
 Readme.txt  
 Lib.dll  
 Qtinf70.dll  
 Record.bmp

Data archive has a fixed folder on the drive “C”. It cannot be changed.

```
C:\REDASDATA
|-----> CFG sub-folder
        Idtst.cfg
        Environ.env
        Param.col
        Probesn.cod
        Splash.bmp
        Alarm1.wav
        Pause.bmp
        Record.bmp
|-----> doc sub-folder
        Documentation and help
|-----> Idtst sub-folder
        Example data files
|-----> txt sub-folder
        Empty folder
```

### 3.5. MULTIPLEX

In case the personal computer is not connected to the Internet, before installing the Multiplex program, verify if the “Microsoft NET Framework 4.0” is correctly installed. Afterwards or if the Internet connection is available, identify and run the SETUP.EXE program from the “*Multiplex*” folder on the CD-ROM.

Follow the on-screen instructions during the installation, but we suggest to modify the installation folder to “C:\Multiplex”. This will simplify the management of the program for non administrator users and the data import function in REDAS5.

A shortcut on the desktop can be created pointing to the MULTIPLEX.EXE program in the installation folder. The following folder structure is created on the personal computer at the end of the installation.

Multiplex folder containing:

```
|-----> Bin sub-folder
        MULTIPLEX.EXE
|----> En-US subfolder
        Multiplex.resource.dll
|-----> Config sub-folder
        Defaultconfig.xml
        Globalparams.txt
        LoggingStatus.config
        Probesn.cod (*)
```

(\*) The authorization file must be manually added at the end of the automatic installation procedure copying it from the CDROM “Aut\_File” folder.

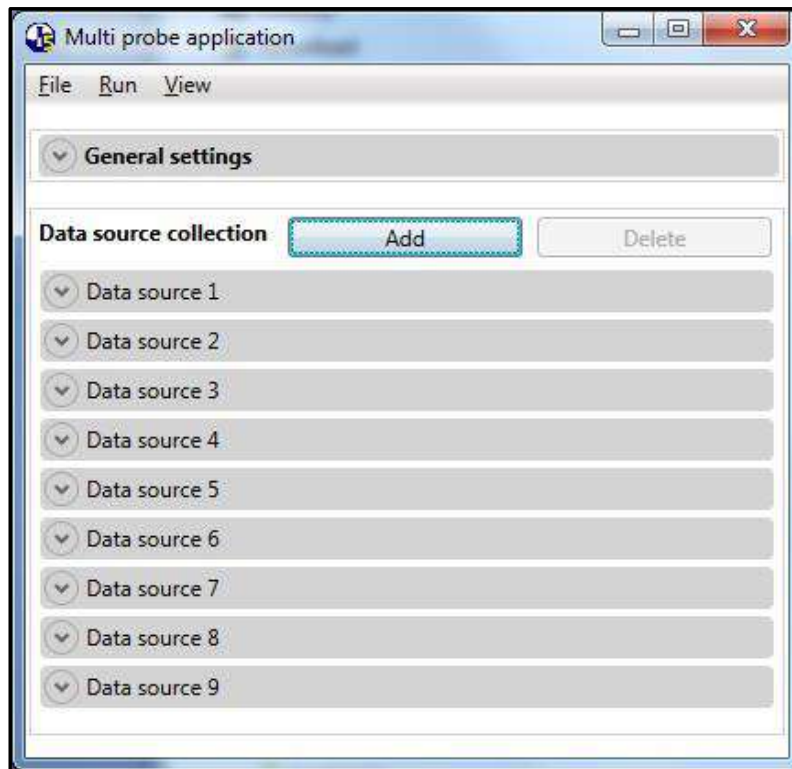


## 4. MULTIPLEX

The aim of the Multiplex program is to provide the simultaneous real-time data acquisition from all the OS3xx CTDs connected to the PC running “Multiplex”.

### 4.1. MENU AND FUNCTIONS

“Multiplex” has the following menus: File, Run, View, and Help. A short description of any menu functions follows.



*File->Open*

It opens an existing multiplex configuration file.

*File->Save*

It saves the program configuration.

*File->Exit*

It exits from the programme and closes the communication port and any open data and configuration files.

*Run->Start*

It initializes the communication with the configured data source units, shows the data acquisition window and starts to acquire and store in the data file acquired data.

Acquired data is presented in the data acquisition window according to the configured data extraction method. **Please be aware that data sent from the CTD “unfiltered” is stored in the “RAW” binary file for the further post-processing carried out using the REDAS5 program.** Therefore, data shown in the dedicated window (see below) is only a temporary representation and sub-set of the whole data sent by the OS3xx CTD to “Multiplex” through the PC RS232C com. ports.

It closes the communication with the connected data source units.

*Run->Stop*

*View->View All data window*

It shows all data window on the computer screen.

*View->Close All data window*

It closes any open data window present on the computer screen. This command is available only when the real-time data acquisition is running.

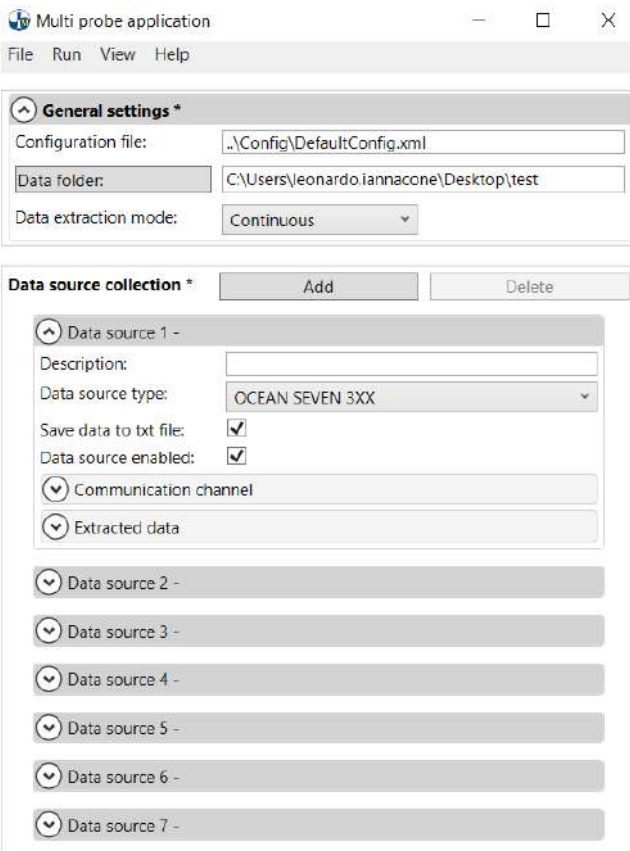
*Help->Help*

It shows the program help (NOT IMPLEMENTED).

*Help->About*

It shows the program information and revision.

#### 4.1.1. General setting configuration



Through the general setting, it is possible to define the parameters needed by “Multiplex” to communicate and manage the acquisition from the configured data sources.

They are:

##### **Config file**

It presents the Configuration file name.

##### **Data folder**

It selects the data folder where the next acquired data will be stored.

##### **Save data to txt file**

It enables or disables data set save into a txt file.

##### **Data source enabled**

It enables or disables the configured data source. During data acquisition, disabled data source is not considered.

##### **Data extraction mode**

Three different methods are foreseen: Continuous, Time and Pressure.

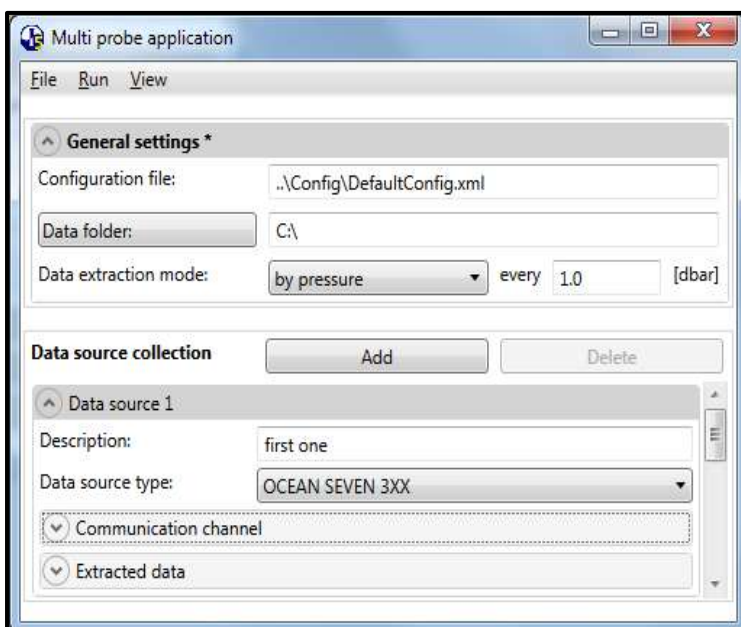
**Continuous:** all received data set will be shown in the data acquisition window (see below).

**Time:** every step in seconds, a data set is selected from the received data set and shown in the data acquisition window (see below).

**Pressure:** every step in dbar, a data set is selected from the received data set and shown in the data acquisition window (see below).

#### 4.1.2. Data source units configuration

It allows the operator to configure the OS3xx CTDs connected to the PC running “Multiplex”.



The following parameters can be configured:

##### **Description**

Short message describing the data source unit. The description will appear on the data source window.

##### **Data source type**

Two possible data source units are configurable: OS3xx CTDs or GPS.

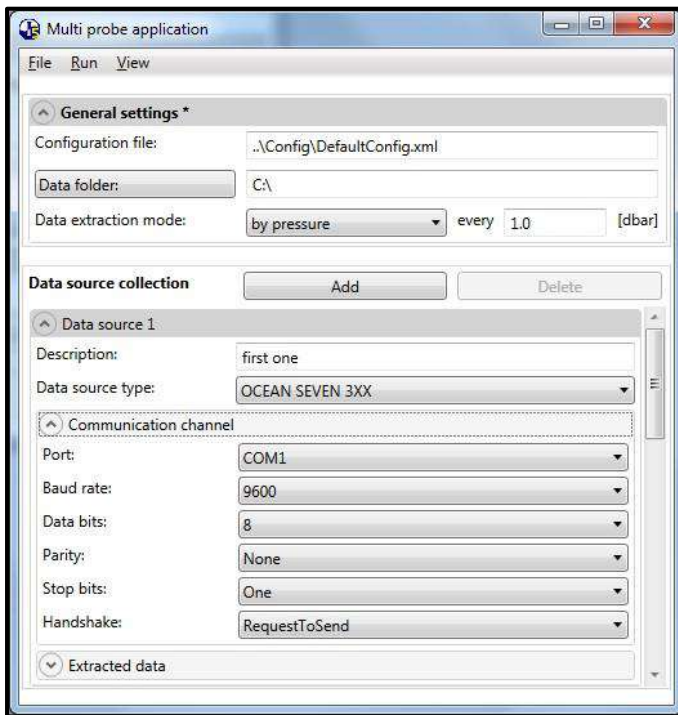
##### **Communication channel**

See the below dedicated section.

##### **Extracted data**

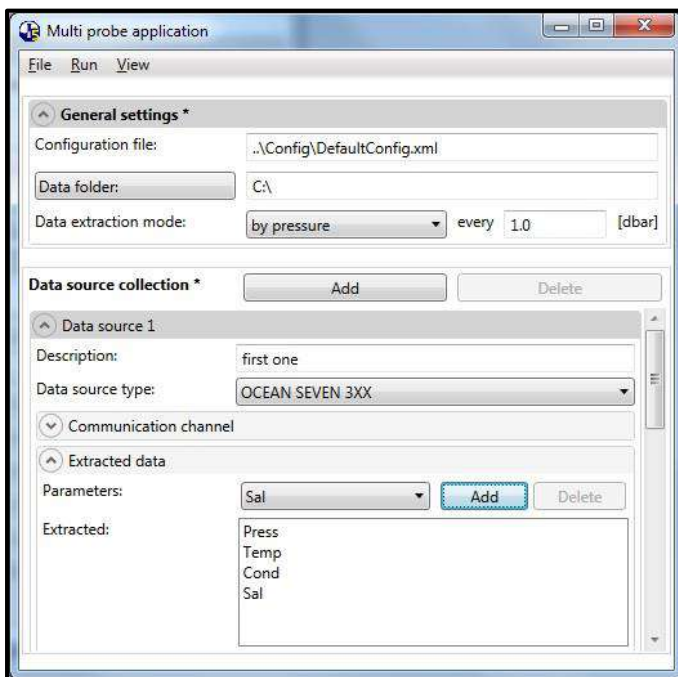
See the below dedicated section.

### 4.1.3. Communication channel



The communication channel allows the operator to define the communication port and the parameters needed to communicate with the OS3xx CTD or GPS connected with the PC running "Multiplex". The communication port number depends on the Com. Port installed. The other parameters default values are: 9600, 8, None, One, None.

### 4.1.4. Extracted data



The extracted data section allows the operator to select, among all the possible parameters, the one that must be shown in real time on the data window.

The order of parameters cannot be adjusted in this position; however, it can be freely adjusted in the data window (see below).

Please only configure the parameters that can be acquired or derived from the parameters acquired through the configured/connected OS 3xx CTDs. Selecting a parameter not present or associable to the OS30xx CTDs may cause "Multiplex" ill-operation.

## 4.2. DATA WINDOW

The data window shows acquired data and OS3xx CTD status in real time. A data window for each configured OS3xx CTD is present. Multiple data windows are possible. Three sections are present in each the data window: i) the window title; ii) data header; iii) data. Each section of the data window shows the different information about the ongoing acquisitions.

Time [h:m:s]	Press [dbar]	Temp [°C]	Cond [mS/cm]	Sal [PSU]	SoundV [m/s]
11:24:06	0.16	18.6906	-0.0007	0.0000	1478.26
11:24:07	0.16	18.6908	-0.0008	0.0000	1478.26
11:24:08	0.16	18.6915	-0.0008	0.0000	1478.26
11:24:09	0.16	18.6918	-0.0008	0.0000	1478.26
11:24:10	0.16	18.6922	-0.0008	0.0000	1478.26
11:24:12	0.16	18.6924	-0.0008	0.0000	1478.26
11:24:13	0.16	18.6919	-0.0008	0.0000	1478.26
11:24:14	0.16	18.6901	-0.0008	0.0000	1478.25
11:24:15	0.17	18.6893	-0.0007	0.0000	1478.25
11:24:16	0.16	18.6884	-0.0008	0.0000	1478.25
11:24:17	0.16	18.6887	-0.0008	0.0000	1478.25
11:24:18	0.16	18.6893	-0.0008	0.0000	1478.25
11:24:19	0.16	18.6902	-0.0008	0.0000	1478.25
11:24:20	0.16	18.6911	-0.0008	0.0000	1478.26
11:24:21	0.16	18.6918	-0.0008	0.0000	1478.26

### 4.2.1. Data window title

In the data window title are indicated: i) the name and type of the data source unit associated with the window; ii) the communication port used by the data source; iii) the serial number of the OS3xx CTD associated with the data window; iv) the name of the "RAW BINARY" data file; v) the sampling rate (samples per second) received from the data source unit; vi) the number of data frames received since the start of acquisition; vii) the number of data extracted from the data received according to the configured extraction method.

Moreover, on the data window title, a push button is present: "STOP", "RESTART". Its value depends on the data source condition. Though this button, it is possible to:

- STOP** While acquisition is running, it is possible to stop the real-time acquisition from the data source.
- RESTART** This command restarts the real-time data acquisition if, during the start-up, there were any problems to start or if the data acquisition was previously stopped. **Please be aware that restarting the acquisition forces "Multiplex" to create a new data acquisition file!**

#### Note

In case the acquisition doesn't start, a red message appears instead of the CTD information on the data source window title. The acquisition may be started by pressing the RESTART button. Before pushing the "RESTART" button, please, always verify that the communication port associated with the OS3xx CTD was properly configured and that the communication cable is connected.

### 4.2.2. Data header

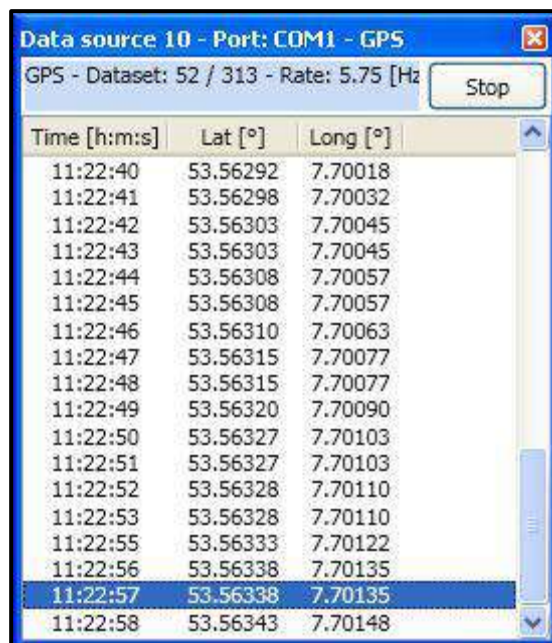
The data header section contains the predefined short name and measuring unit associated with each selected parameter. The columns in the data header can be easily aligned by moving them using the mouse. The names which appear on the data header section can be configured by editing the configuration text file contained in the "CONFIG" multiplex installation sub-folder, whose name is "Globalparams.txt". We strongly suggest creating a backup file before modifying the "GlobalParams.txt" contents.

### 4.2.3. Real-time data

The data area of the window shows in rows and columns data received from the OS3xx CTDs. The last extracted data rows are shown and remain on the window at the end of the acquisition. The 100 data rows can be easily back-scrolled.

### 4.2.4. GPS data window

Through "Multiplex", it is possible to acquire the geographical coordinates latitude and longitude. The GPS can be connected to the personal computer running "Multiplex". Multiplex decodes the GPPL and/or the GPAA sentences to gather the latitude and longitude geographical coordinates. Acquired coordinates are automatically stored in data files together with the data acquired in real time.



Time [h:m:s]	Lat [°]	Long [°]
11:22:40	53.56292	7.70018
11:22:41	53.56298	7.70032
11:22:42	53.56303	7.70045
11:22:43	53.56303	7.70045
11:22:44	53.56308	7.70057
11:22:45	53.56308	7.70057
11:22:46	53.56310	7.70063
11:22:47	53.56315	7.70077
11:22:48	53.56315	7.70077
11:22:49	53.56320	7.70090
11:22:50	53.56327	7.70103
11:22:51	53.56327	7.70103
11:22:52	53.56328	7.70110
11:22:53	53.56328	7.70110
11:22:55	53.56333	7.70122
11:22:56	53.56338	7.70135
11:22:57	53.56338	7.70135
11:22:58	53.56343	7.70148

**Note** If the GPS is connected through the PC running "Multiplex"

### 4.3. DATA FILES

Multiplex automatically creates three binary archives during the data acquisition process.

1. "\*.RAW" contains all data acquired from the OS3xx CTD.
2. "\*.EXT" contains all data acquired from the connected GPS.
3. "\*.XFR" contains the information about the OS3xx CTD, its parameters, its calibration coefficients, etc. Information stored in the "XRF" file is later used by the REDAS5 program during the data file import to create the data header.

The three binary file names are automatically generated by "Multiplex" using the start acquisition date and time and the OS3xx CTD serial number.

### 4.4. LOG MULTIPLEX OPERATIONS

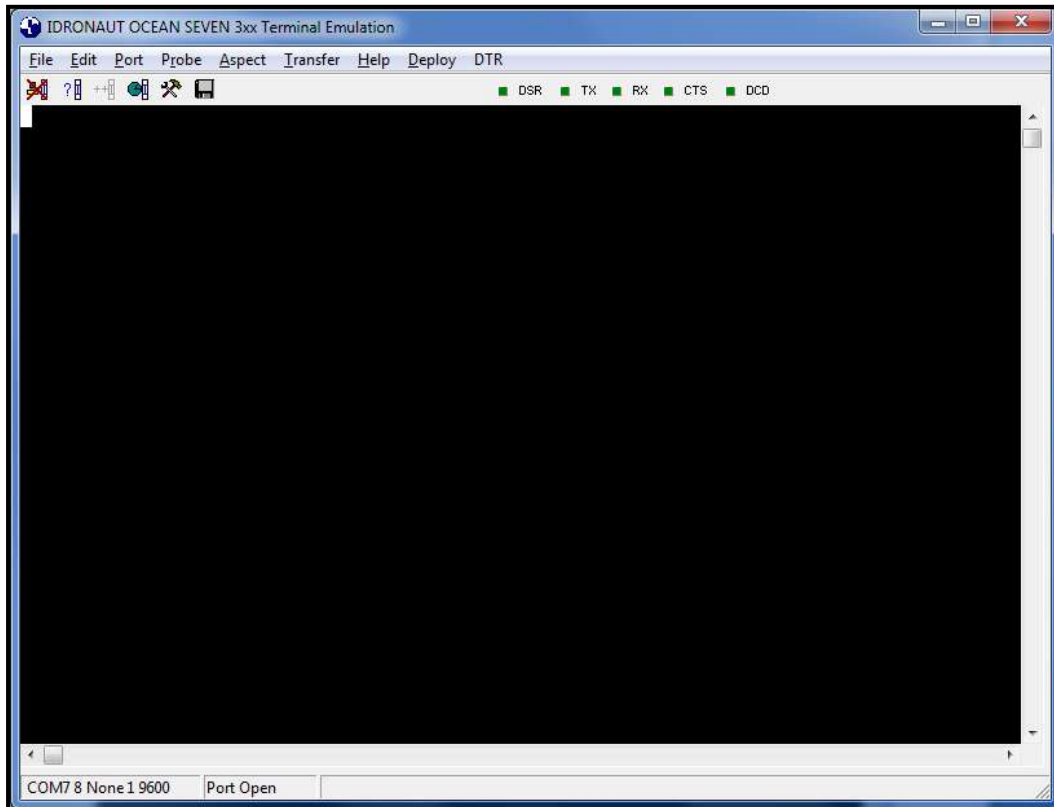
It is possible to force the logging of messages concerning all the "Multiplex" operations. The log file can be later reviewed to analyze any problems met during the field operations. To enable the logging, modify the contents of the file "LoggingStatus.Config" which is stored in the "BIN" folder setting to 1 the log parameter. i.e.: 1= Log, 0= No log.

## 5. ITERM PROGRAM

The aim of the ITERM programme is to provide a simple and reliable tool that IDRONAUT customers can freely use to communicate with their OS3xx CTDs.

### 5.1. PROGRAMME MENUS AND FUNCTIONS

The ITERM Main Menu has the following items: File, Port, Probe, Transfer, Help. A short description of any menu and functions follows.



*File->Exit* It exits from the programme thus closing the communication port and any open files.

*Edit->CopySelectionToClipboard*

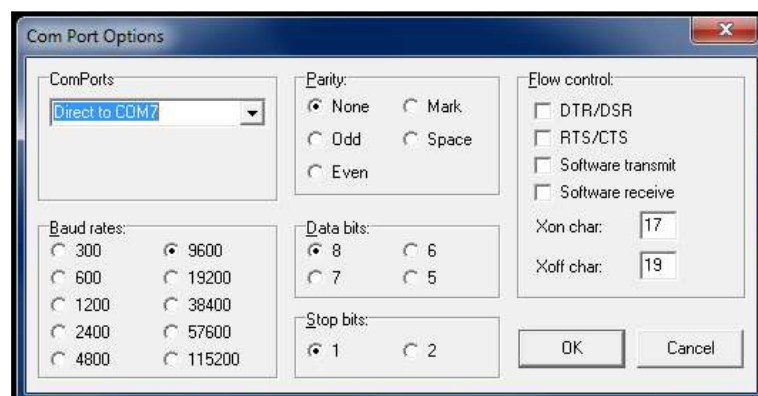
This function copies the selected text to the Windows operating system clipboard buffer.

*Edit->Clear window*

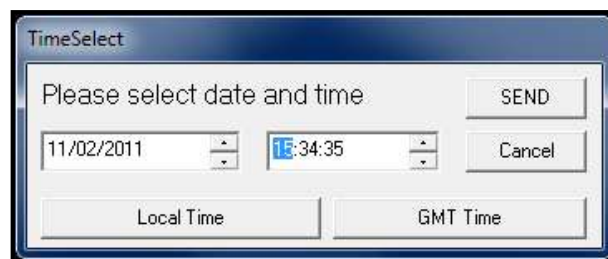
This function clears the ITERM window.

*Port->Set parameters*

This function allows the operator to set and define the communication port parameters. Default values for the OS3xx CTDs are: 9600bps, 8bit data, 1stop bit, No parity, Hardware hand checking: CTS/RTS.

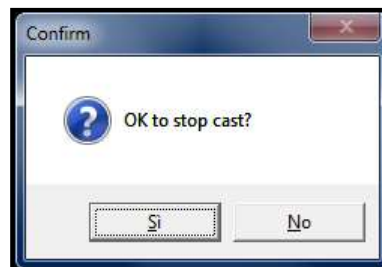


- Port->Close* It closes the communication port and allows the port configuration. When the port is closed, this command becomes “Open”.
- Probe->Identify* It identifies the connected probe; information like serial number, hardware and firmware release is shown on screen in the ITERM program status and title bar. This function must be performed before running any function in the probe menu. This function is particularly useful to also switch the probe from “non verbose” mode to “verbose” mode. At the end of the probe identification, the probe main menu is shown on the PC screen.
- Probe->Upgrade* This function allows the operator to verify and, if needed, upgrade through a step-by-step procedure the probe management firmware. A detailed description of the OCEAN SEVEN 3xx probe firmware upgrading procedure can be found in the “Service” section of the relative Operator’s Manual.
- Probe->Set Time* This function sets up probe time and date. It is possible to select the new probe time among: GMT, local time or customized date and time.



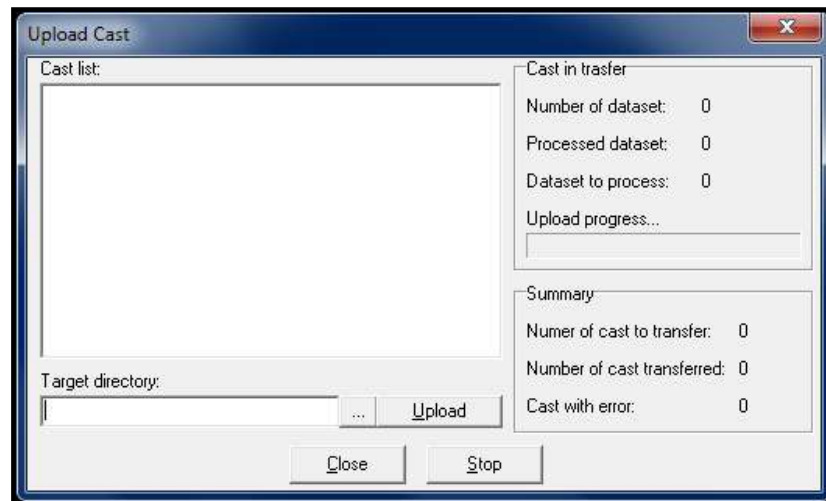
*Probe->Unattended cast* n.a.

*Probe->StopCast* This command concludes an “unattended” data acquisition cycle, which was previously started using the “Probe->Unattended Cast” command.

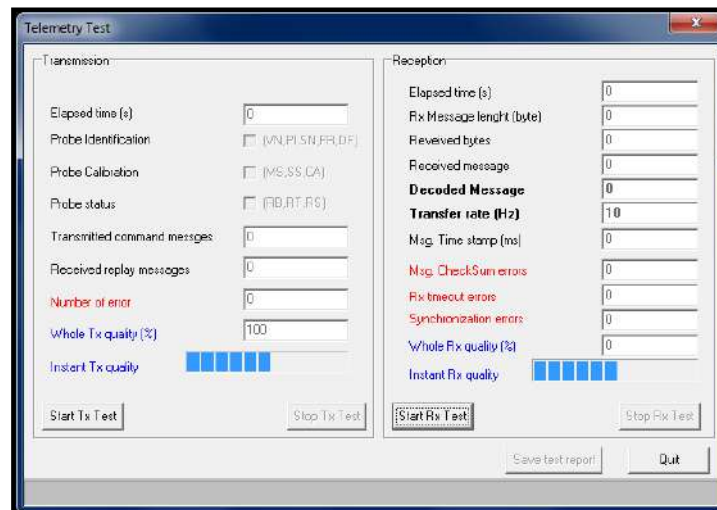


*Probe->UploadCast*

This function allows the operator to retrieve data stored in the probe memory and to store it in “Text” files on the PC. The cast uploading is automatically performed by the program. This function is available only after the probe has been identified using the Probe Identify function. More than one cast can be selected by using the mouse and the CTRL or SHIFT keyboard key. “Target directory” must be configured before starting the upload. After the target directory has been configured and the desired cast has been selected from the cast list window, the upload button can be pressed. The programme uploads the probe memory cast by cast. Uploaded data is stored in text files, a file for each cast.

*Probe->Telemetry Test*

This function allows the operator to perform the test of the probe telemetry interface by exercising the OCEAN SEVEN 3xx probe non-verbose communication protocol. The test can be used to verify the RS232C connection too.

*Tx test*

This test verifies telemetry by sending commands to the connected probe.

*Rx test*

This test verifies telemetry by instructing the connected probe to continuously send acquired data. The Rx test is useful to perform the fine-tuning of the telemetry Deck Unit transceiver modem.

*Aspect->Font*

This function allows the operator to decide the type of font to be used to show messages on the terminal window.

*Aspect->Colour*

This function allows the operator to select the foreground and background colours



among a list of possible choices.

*Transfer->SendTextFile* This function allows the operator to transfer a text file to the PROBE connected through the serial port.

*Transfer->CaptureToFile* This function captures the characters received and sent through the serial port to a text file. The operator can select the file name and folder. By invoking this function, once ITERM is capturing, the character stops capturing and returns to the standard operations.

*Help->Contents* It shows this help file.

*Help->About* It shows notice about the ITERM programme release.

## 5.2. TOOLBAR

On the programme toolbar, there are the shortcuts to the programme functions.



Disconnects the communication port, freeing the port for other programmes or allowing the communication port parameter modifications.



Detects and identifies the connected OCEAN SEVEN3xx probe type. At the end of the identification on the status and title bar of the programme, the information about the connected probe appears.



Upgrades the connected and identified probe firmware. It is currently under development for the OCEAN SEVEN 316Plus.



Sets the connected probe time and date, according to the PC or customized settings.



Accesses the communication port parameter set-up.



Captures transmissions from the connected probe and keyboard typing and stores them in the selected text file. A red cross appears over the icon when running. Pressing once stops the capture and closes the text file.

## 5.3. START-UP SWITCHES

It is possible to customize the programme at the start-up by adding the following switches to the programme properties:

- p x                   Where x represents the communication port number 1..8
- b bps                Where bps represents the communication speed and can be 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

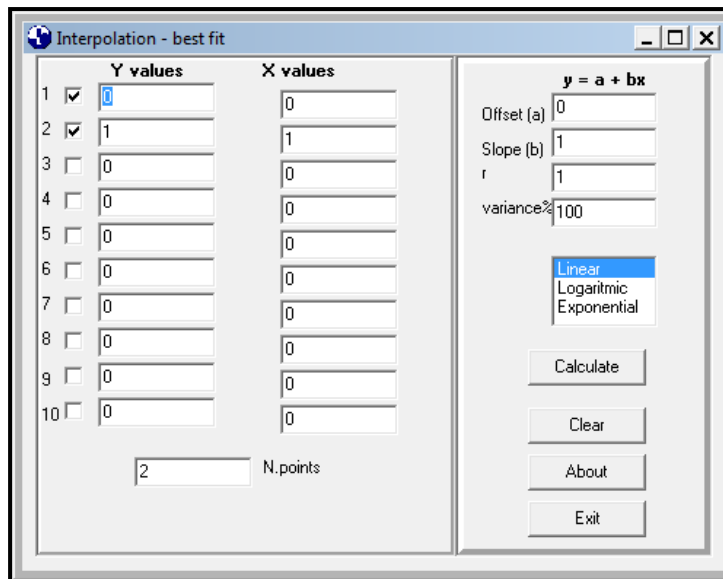
## 5.4. TOOLS DISTRIBUTED WITH THE ITERM PROGRAM

The following IDRONAUT tools are distributed together with the ITERM program:

- ❖ Interpolate.
- ❖ OS3xx Probe Memory & Battery Autonomy.
- ❖ Seawater Fundamental Property Calculation.

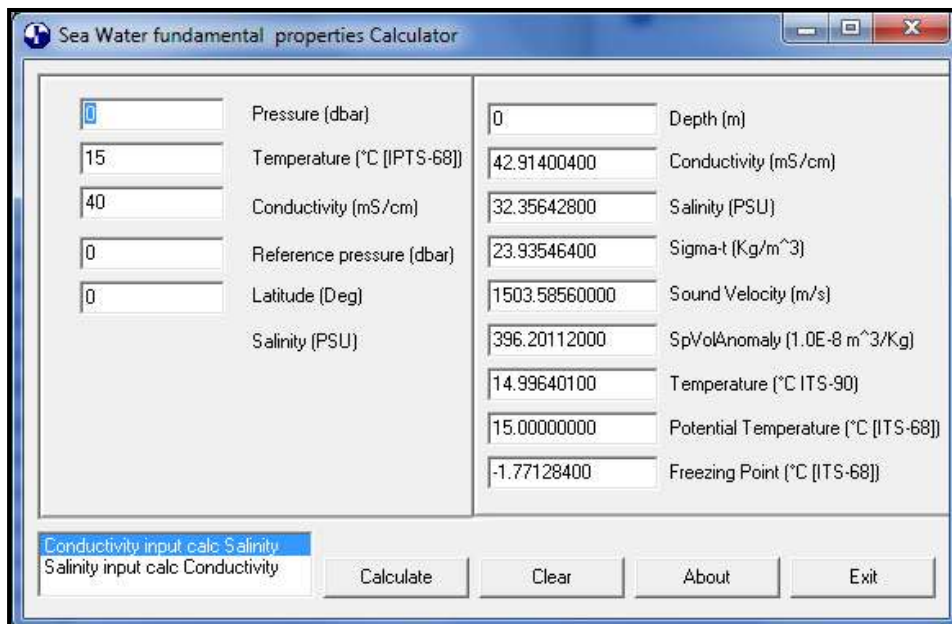
### 5.4.1. Interpolate

This program allows calculating “a” and “b” coefficients (slope and offset) to interpolate a set of 10 tabbed data (see picture) using: linear, logarithmic or exponential interpolation technique.



### 5.4.2. Seawater Fundamental property calculation

This tool allows the probe to calculate the most important fundamental properties of seawater. Through a very simple interface, the operator can enter the Temperature, Conductivity and Pressure sensor values and calculate the derived parameters instantaneously. Calculation is performed using the UNESCO formulae and recommendations.



### 5.4.3. OS3xx Probe Memory & Battery Endurance

The internal probe battery endurance can be easily calculated using the “Os3xxProbeAutonomy” tool, which is distributed with the ITERM program and the REDAS-5 program. This tool, through a simplified user interface (see below), allows the operator to select the probe type, select the sensors interfaced by the probe and afterwards calculate the probe battery and data recording autonomy.

Ocean Seven 3xx probe Memory and Battery autonomy calculator

### Probe type

- OCEAN SEVEN 304
- OCEAN SEVEN 305
- OCEAN SEVEN EA/89
- OCEAN SEVEN 304/100
- OCEAN SEVEN 316
- OCEAN SEVEN 316Plus
- OCEAN SEVEN 319
- OCEAN SEVEN 320

### Sensors & Options

<input type="checkbox"/> Fluorometer	<input checked="" type="checkbox"/> Pressure 0.05%	<input type="checkbox"/> Pressure 0.01%
<input type="checkbox"/> CDOM	<input checked="" type="checkbox"/> Temperature	<input type="checkbox"/> 2nd Temperature
<input type="checkbox"/> Turbidity meter	<input checked="" type="checkbox"/> Conductivity	<input type="checkbox"/> 2nd Conductivity
<input type="checkbox"/> Rhodamine	<input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/> Inductive Modem
<input type="checkbox"/> Transmissometer	<input type="checkbox"/> pH	<input type="checkbox"/> Trilux/Unilux
<input type="checkbox"/> PAR - Li193SA	<input type="checkbox"/> Eh	<input type="checkbox"/> Antifouling
<input type="checkbox"/> Current meter	<input type="checkbox"/> Iodide	<input type="checkbox"/> CT sensor pump
<input type="checkbox"/> Optode	<input type="checkbox"/> Chloride	<input type="checkbox"/> Bluetooth Wireless
<input type="checkbox"/> MiniSVS	<input type="checkbox"/> Ammonia	<input type="checkbox"/> Telemetry
<input type="checkbox"/> Rosette	<input type="checkbox"/> Nitrate	<input type="checkbox"/> Other
<input type="checkbox"/> Altimeter	<input type="checkbox"/> Bottom switch	

N. of sensor

### Memory

Memory size (MB)

Standard     Extended

### Battery

Ah     VDC

Battery pack

- 10xAA Alkaline (15V, 2.6Ah) Int.
- 10xAA NiMh (12V, 2.5Ah) Int.
- 10xAA Lithium (12V, 2.9Ah) Int.
- 8xAA NiMh ( 9.6V, 4.5Ah) Int.
- 4xAA Alkaline ( 6V, 2.6Ah) Int.
- 4xAA Lithium ( 6V, 2.9Ah) Int.
- 2xPP3 Alkaline ( 9V, 1.1Ah) Int.
- 2xPP3 Lithium ( 9V, 2.4 Ah) Int.
- 10xD Alkaline (15V, 18Ah) Ext
- 12x1.2V NiMh ( 14.4V, 4.5Ah) Ext
- 12x1.2V NiMh ( 14.4V, 2.85Ah) Int
- Custom battery pack

### Measurement cycle

Measure interval (s)

Dataset x measure

ON time x measure (s)

Switch On/Off between measure

### Power Consumption

Running (Ah)

Stand-by (Ah)

Self discharge (%)

Memory autonomy (day)

Battery autonomy (day)

Battery autonomy (hour)

Max. Dataset

DataSet x day

Mea cycle x day

Clear

Calculate

About

Exit

## 6. REDAS5 PROGRAM

Documentation about the REDAS5 program installation, start-up and use can be found in the dedicated REDAS-5 Operator's Manual on the "Multiplex & REDAS5" CDROM.

### 6.1. MULTIPLEX DATA FILE IMPORT

Multiplex generates one binary file for each OS3xx CTD interfaced. The only possibility to process, visualize, plot and convert the acquired data into text files is to import these files using the REDAS5 program.

A dedicated command under the REDAS5 "FILE->IMPORT" menu easily allows selecting the binary file from the Multiplex program data folder and importing it by assigning to a cruise database. The philosophy about the cruise data base is responsibility of the operator. For instance acquired data can be assigned to a "Cruise data base" for each OS3xx CTD; or it can be assigned to single "Cruise data base" for each sampling point; or it can be organized per day, per month, etc..

In case the GPS is connected to the Multiplex program, it is mandatory to enable the "Latitude & Longitude" check mark under the ENVIRONMENT->NMEA tab. This set-up "informs" the REDAS5 that data files to import are completed with the GPS information.



**AT THE END OF DATA IMPORT, REDAS5 AUTOMATICALLY DELETES THE ORIGINAL MULTIPLEX BINARY FILES. WE STRONGLY SUGGEST THAT YOU CARRY OUT A BACKUP OF THE MULTIPLEX ACQUIRED DATA FILE BEFORE IMPORTING THEM IN REDAS-5.**

***Note:*** If data files are imported without the correct environment set-up, GPS information is ignored.

### 6.2. IMPORTED DATA POST-PROCESSING

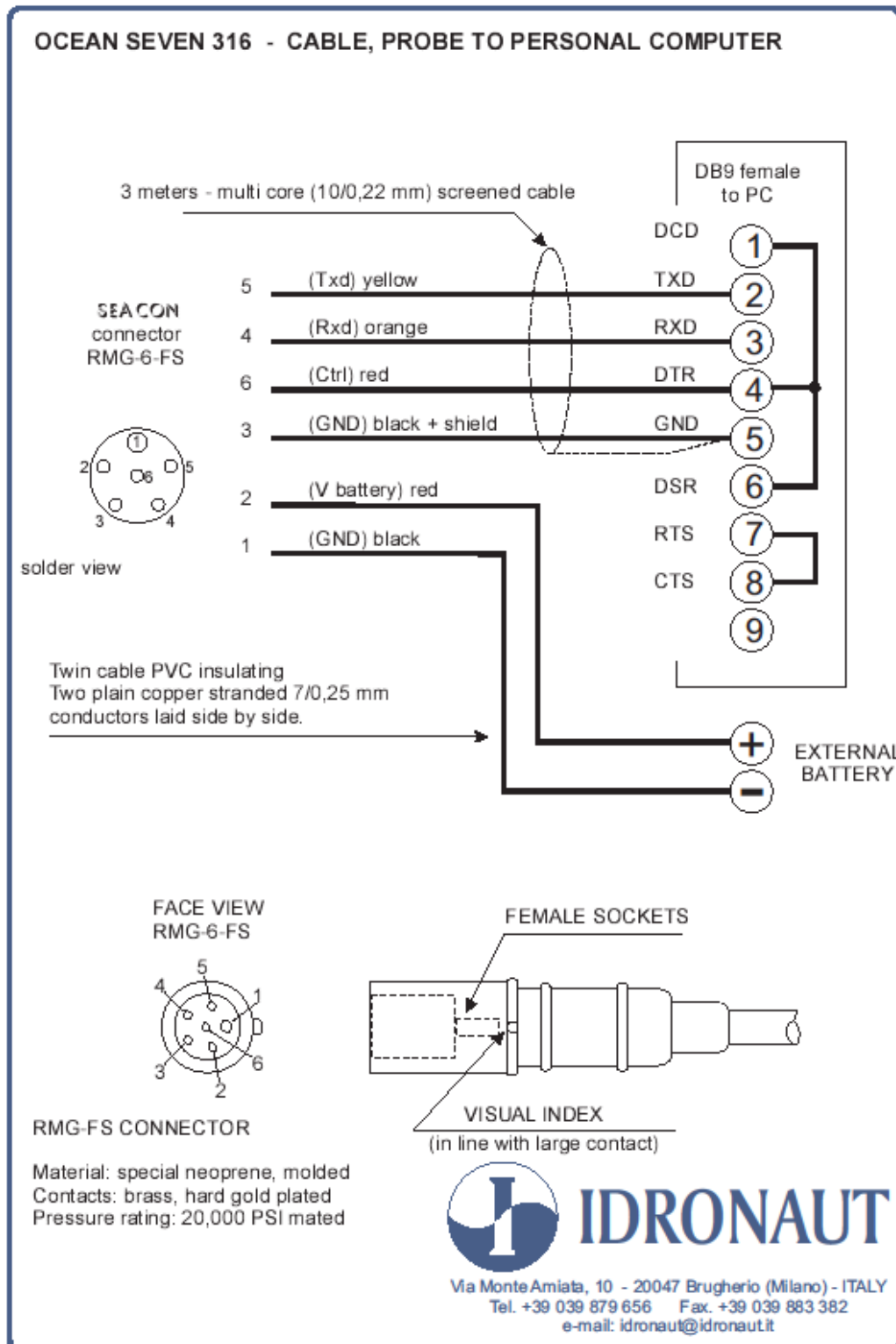
Once data is imported in the REDAS5 database, it can be post-processed, plotted, exported according to the desired method. We suggest having a look at the screen capture sequences which describe the REDAS5 data post-processing and that can be found on the IDRONAUT CD-ROM under the "Literature & Documentation" folder.

### 6.3. IMPORTED DATA CONVERSION

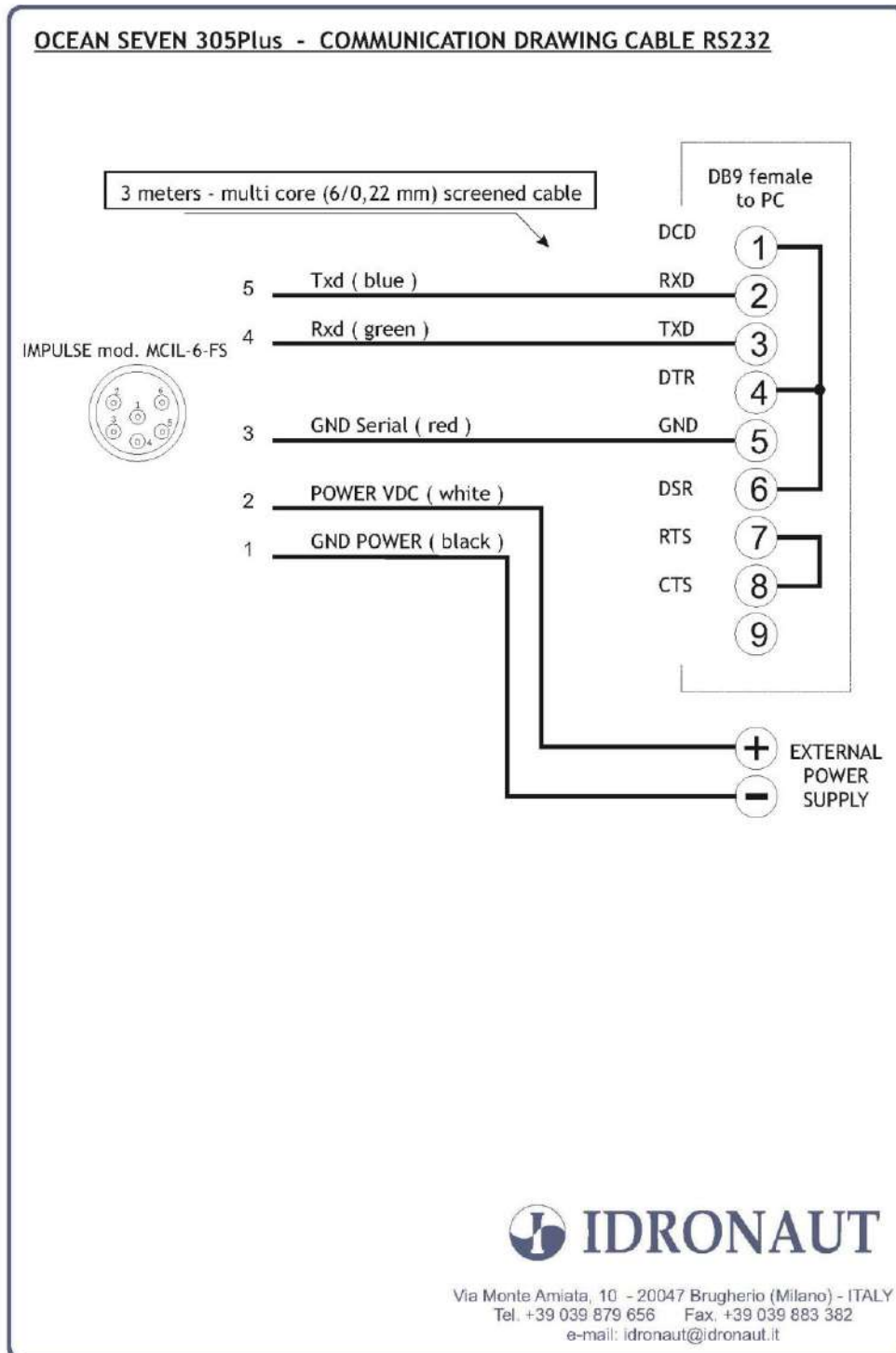
Data imported in REDAS5 can be easily converted into text files. Text file contents and format can be freely and easily configured using the REDAS5 configuration command. We suggest having a look at the screen capture sequences which describe the REDAS5 configuration and export to text file that can be found on the IDRONAUT CD-ROM under the "Literature & Documentation" folder.

7. OCEAN SEVEN 3xx CTDs cables

7.1. OS316PLUS/320PLUS CTD RS232-C 3M LABORATORY CABLE



7.2. OS305PLUS CTD RS232-C 3M LABORATORY CABLE



### 7.3. 8.5MM POLYURETHANE SUBMERSIBLE CABLE

200m of the below cable is provided on a plastic reel, completed with the connectors needed to connect the OCEAN SEVEN 3xx CTDs to the Multiplex Deck Unit.

#### CONSTRUCTION DETAILS

- 2 X 19 AWG: Tinned copper conductor 42x0,15 mm Cross-linked polyethylene insulation, nominal thickness 0,50 mm, nominal diameter 2,10 mm, colors red, black.
- 2 X 2 X 24 AWG: Tinned copper conductor 19x0,13 mm Polypropylene insulation, nominal thickness 0,25 mm, nominal diameter 1,15 mm Cores twisted in pairs colors white/blue, grey/orange
- Elements laid up together with polypropylene filling yarn
- Protective non woven tape
- Tinned copper braid overall shield, wire diameter 0,10 mm, coverage 85%
- Protective non woven tape
- Aramidic yarn braid
- Hydrolysis resistant PUR outer sheath, nominal thickness 1,10 mm, colours orange
- Nominal overall diameter 8,30 mm
- Metric marking : “ IDRONAUT – MILANO - ....meters) ”

#### ELECTRICAL AND PHYSICAL CHARACTERISTICS

Electrical resistance conductors 19 AWG:	< 26,70 ohm/km @ 20°C
Electrical resistance conductors 24 AWG:	< 88,6 ohm/km @ 20°C
Nominal mutual capacitance (24 AWG) :	60 pF/m
Nominal impedance @ 1 MHz (24 AWG) :	93 ohm
Attenuation @ 1 MHz(24 AWG):	< 2 dB/100 m
Insulation resistance:	> 1000 Mohm*km @ 20° C
Working voltage :	600 V

#### OTHER CHARACTERISTICS

Weight in air :	96 kg/km
Weight in seawater :	36 kg/km
Breaking strength :	> 250 kg
Bending radius static min. :	50 mm
Bending radius flexing min. :	100 mm
Working temperature :	-40/+80 °C