NEMO USER MANUAL

HORIZON ***2020***

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Deliverable number	Short title
	NEMO user-manual

Long title

User manual of NEMO, the reformatting software

Short description

User Manual of NEMO software delivered in the frame of SeaDataNet European project. This software is used to reformat ASCII files to one of the ASCII SeaDataNet formats: ODV (Ocean Data View) or MEDATLAS and the binary SeaDataNet netCDF

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Dissemination	Copyright terms
Public	

History

Version	Authors	Date	Comments
1.2.0	M.Fichaut	13/03/2009	Creation
1.2.11	M.Fichaut	25/05/2009	Update : Report when updating vocabulary Restore button in NEMO configuration Rupture indicator for station header Chronological Julian date accepted in the input file Multi-station ODV file accepted as input file
1.2.12	M.Fichaut	04/06/2009	Update : Minus modification on time and latitude descriptions in paragraph 7.3.10
1.2.14	M.Fichaut	15/07/2009	Includes installation procedure for Linux and Unix, not tested in IFREMER
1.2.16	M.Fichaut	26/11/2009	Update : Modification of the size of Setting windows
1.2.25	M.Fichaut, S. Brégent	25/05/2010	Update : • Global validation of all NEMO steps: §5.5 • Batch mode for NEMO: §7.8 • Use of P01 parameter code • Default value for bottom depth: §7.3.11 • Default value for station start time §7.3.8 and 7.3.9

			• NEMO settings: choose the default quality flag (§6.12) • Corrections of several anomalies • Source code rewriting to take into account the conversion of big files (several thousands of stations): modification of the way of converting files.
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1.4.5	M.Fichaut, S. Brégent	09/07/2012	Update: Version number
1.5.0	D. Capitaine, S. Brégent M. Fichaut	13/06/2013	Update: - Possibility to convert a file into netCDF format - Version V2 of BODC vocabularies, number of the lists updated - add above sea level
1.5.1	M. Fichaut	02/07/2013	Update : - add C19 in the vocabulary list and mapping C16-c19 for backward compatibility
1.5.2	S. Brégent	16/09/2013	Update: §7.5.4 CDI summary file for Mikado (column PDV_CODE renamed as P02_CODE; column FORMAT_VERSION added)
1.5.3	D.Capitaine	07/09/2013	Update : - update installation information - §7.2.1 Nemo accept now ISO-19139 CSR format - Settings: EDMO list and SeaDataNet Default flag values - Add FAQ chapter §2

1.5.4	S. Brégent	14/05/2014	Update: Version number
1.6.0	S. Brégent	25/02/2015	Updates: - §1.2: require java >= 1.7 - §6.10.3 & 7.3.1: improve QC flags explanations (functionalities did not change) - §7.2: The cruise tab is now displayed for ODV conversion - §7.4: new parameters attributes available: instrument and fall_rate - §7.5.2.1: DEPH is allowed as a primary variable in MEDATLAS - §7.5.3: SeaDataNet references added automatically
1.6.1	S. Brégent	15/07/2015	Update: Version number
1.6.2	S. Brégent, M. Fichaut	11/01/2016	Update: Version number • P02 snapshot in §7.4.2.3
1.6.3	S. Brégent	19/05/2016	Update: Version number
1.6.4	M. Fichaut	24/06/2016 18/07/2016 01/08/2017	Add precisions in §7.4.2.4 under Start and End, and Format. Add warning in §6.11.3 Correction of links in §8 Correction of typos Update version number update required java version (>=1.8) in §1.2 Add Data columns selection section description in §7.1.3 and §7.4
1.6.5	S. Brégent	27/09/2017	Update: version number
1.6.6	M. Fichaut	23/11/2017	Update: version number
1.6.7	S. Brégent	11/10/2018	§6.1126 Settings: update SeaDataNet flags window §6.5 Settings: add CSR metadata EDMO code in settings §6.10 Cruise: add BSH CSR reference field §7.3.10 Station: Add a new format for Latitude/Longitude
1.7.0	S. Brégent M. Fichaut	20/03/2020	Full revision of the document and addition of the following new information: §7.1.2: new field concerning the variant §7.1.3.2: usage of CSV separator in station header §7.1.3.4: new data termination indicator for CSV files with separator §7.3.1 explanations on LOCAL_CDI_ID build §7.3.8 and 7.3.9: usage of datetime format with date and time inseparable §7.4: mandatory parameters for biological, flow cytometry, and microlitter variants. §7.8 add new batches arguments (cruise name, cruise comment, ship code, local CSR identifier, BSH CSR reference) Update URLs in SDN references examples: §7.2.2, §7.5.3
1.7.1	S. Crouzille	03/02/2021	§7.5.4 : update DATASET_ABS description §7.8: change description for –datasetRef and -cruiseComment arguments
1.7.2	M. Fichaut, S. Crouzille	18/10/2021	§6: Update the web services settings screenshot. §0: Addition of ADCP example
1.7.3	S. Crouzille	19/01/2022	Update: Version number
1.7.4	S. Crouzille, M. Fichaut	22/06/2022	Update: version number Update figures 5, 16 and 17
2.0	M. Fichaut	23/01/2023	Nemo 2.0 focuses on new functions and tools to ease the use of NEMO. New functions: added in the data tab: • Drag and drop are available in the parameters table (§7.4.3) • Multiline selection for the addition of an instrument, a default value, a format, or a unit in the parameter table (§7.4.1)

			• For CSV files: Auto-fill of the parameter table (§7.4.2.5) • For CSV files: Auto-fill of the start and end position in the parameter table for the measured parameter (§7.4.2.4.7) and the corresponding flags (§7.4.4.2) The CDI summary file for MIKADO has been enriched to provide more metadata (§7.5.4) and a track is now generated for trajectory files (§7.5.4.3) as well as a list of projects (EDMERP) linked to a cruise (§7.5.4.2. A new BatchBuilder tool helps to create .bat or .sh batch command files (§7.8.4) The NEMO parser has been rewritten to separate clearly the management of CSV files and Text files without separators (§7.3 introduction and §7.4.1.1)

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1. Introduction

For purposes of standardisation and international exchange, SeaDataNet has defined common formats [1] for data exchange and distribution which are:

- ASCII SeaDataNet ODV [1] (Ocean Data View) format is a version of the ODV version 4 generic spreadsheet format modified to carry additional information required by SeaDataNet. Variants of this SeaDataNet ODV format have also been defined for Biological [4] [5], flow cytometry [8] [9], and microlitter data [6] [7].
- MEDATLAS [1] [2] which is an auto-descriptive ASCII format designed in 1994, by the MEDATLAS and MODB consortia, in the frame of the European MAST II program in conformity with international ICES/IOC GETADE recommendations. As for ODV, the format has been upgraded to carry additional SeaDataNet information,
- SeaDataNet netCDF format [1] which is an auto-descriptive binary format

netCDF and ODV formats are both mandatory in SeaDataNet while MEDATLAS is optional.

All these formats are described on the SeaDataNet website, and examples are provided for each format type (https://www.seadatanet.org/Standards/Data-Transport-Formats).

NEMO is a reformatting tool able to reformat any ASCII files (input file) of vertical profiles, time-series, and trajectories to a SeaDataNet ASCII format (output file at ODV or MEDATLAS format) and SeaDataNet netCDF format.

1.1. Main principles

The input files of NEMO can be individual vertical profiles, time series or trajectories, or files grouping several vertical profiles, time-series, or trajectories of the same data type (CTD, bottle cast, current meter, thermosalinograph…). All these entities (vertical profile, time-series, and trajectory) are called stations in NEMO software.

NEMO can reformat:

- a single file or
- a group of files in one directory or
- a group of directories containing several files.

The only requirement is that the input files of NEMO are ASCII, with data measurements in columns.

As the entry file can be in all kinds of ASCII formats, NEMO must be able to read all these formats to translate them to ODV, MEDATLAS, or netCDF.

To do so, the principle is that the user of NEMO describes the input file formats so that NEMO can find the information, which is necessary to generate the files at SeaDataNet formats.

One very important pre-requirement is that in a set of input files, the information about the stations must be located at the same position: same line in the file, same position on the line, or same column if Comma Separated Value (CSV) format. Furthermore, station information must be in the same format in all the stations.

For example: *for all the stations, the latitude is on line 3 on the station header, from character 21 to character 27(or in the 4th column in CSV format), and its format is decimal degrees (+DD.ddd).*

1.2. NEMO and MIKADO interactions

NEMO was designed to be linked to the SeaDataNet tool 'MIKADO' [3] through the generation of a text file that can be converted to Excel.

The principle (Figure 1) is that while NEMO converts one file or a collection of files (like for example a collection of XBT files in a specific geographical area), it also generates a " CDI summary CSV file" which contains all the minimum information necessary to create CDI records in the SeaDataNet catalogue. This CSV file can be read by MIKADO (automatic generation) using a JDBC driver and then XML CDI files are generated (using predefined queries delivered with MIKADO) and can be directly exported to the central SeaDataNet catalogue.

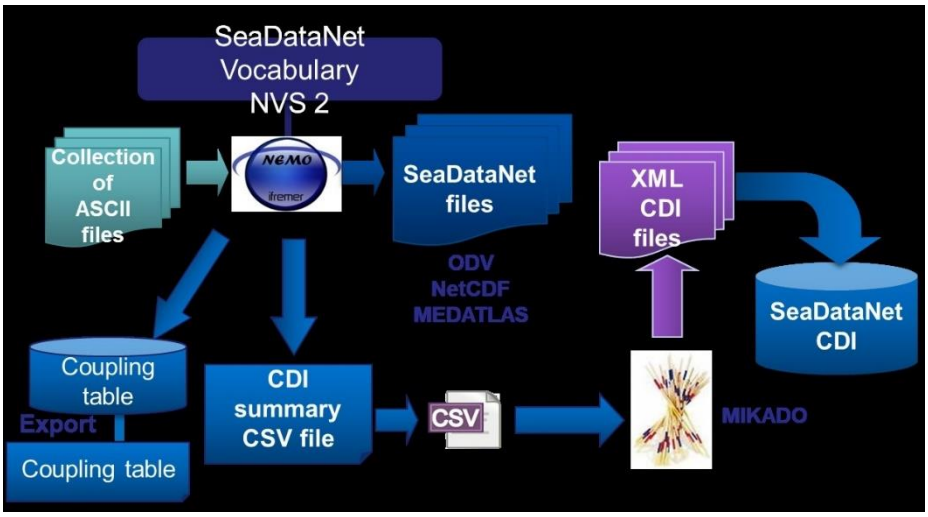


Figure 1– From « raw » data files to SeaDataNet CDI catalogue

1.3. Technical characteristics

NEMO is a portable software that can be downloaded from the SeaDataNet website https://www.seadatanet.org, free of charge, with its user manual.

It is written in Java Language (Version >= 1.8) and it is available under Microsoft (tested with Windows 10) It is also available for Linux and Unix but not tested in IFREMER.

NEMO works offline; however, as it uses the SeaDataNet common vocabularies web services to update its lists of values, a network connection is needed only when an update of these lists is necessary.

- To know if Java is available on your computer, in the right version, follow these steps:
  - Open the 'Start' menu, then 'Execute'
  - On the displayed window, enter: 'cmd', then click on the 'OK' button
  - Enter 'java -version'
- Check if the command has been executed:
  - If not, download the last java version at http://java.com/en/download/index.jsp.
  - Else, check the version displayed. The version should be greater than or equal to 1.6.

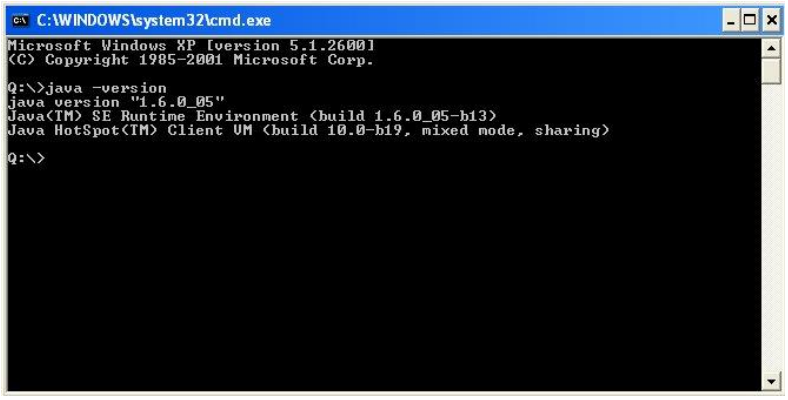


Figure 2 – Check the Java version installed on your computer

2. FAQ

The Frequently Asked Questions about Nemo software are available online and are regularly updated:

https://www.seadatanet.org/Standards-Software/Software/NEMO/FAQ

If you do not find the answer you need in this FAQ, do not hesitate to contact our helpdesk at sdn-userdesk@seadatanet.org

3. NEMO installation and uninstallation

3.1. NEMO installation

3.1.1. Installation for Windows

Get NEMO software from the SeaDataNet Web site, under Standards & Software:

https://www.seadatanet.org/standards_software/software/nemo

Copy the zip file on your computer, and unzip it.

You will get 2 files: install_nemo.jar and launcher.bat

If Java is not installed on your computer (see chapter 1.3), install it.

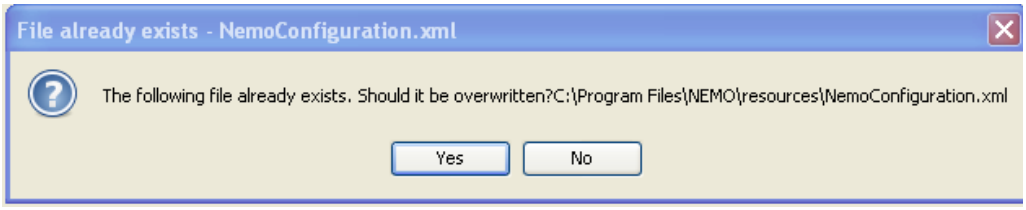
To install NEMO double click on the file launcher.bat.

Then select your language and run the installation.

1. Accept the terms of the license agreement.
2. Select the installation path (default is C:\ Program Files\NEMO)
   - target directory is created if it doesn't exist.
   - if the target directory exists, you will have to confirm overwriting

   Even if you choose to overwrite an existing directory, you will be able to keep your preferences from Nemo's last installation

3. After the Pre-installation script click on the “Next” button
4. Confirm the installation path and click on the “Next” button
   - if you overwrite an existing directory, you will be asked 5 times to overwrite particular files:
     - NemoConfiguration.xml
     - nemo.ini
     - userParametersLabels.xml
     - userParametersStandardNames.xml
     - userParametersnetCDFLongNames.xml:



These 5 files contain your Nemo Settings and your labels (§7.4.2.4-Fulfill parameter values and test).

For each of these 5 files, click “NO” to keep your preferences.

5. If you want a shortcut on your Desktop check the box circled in red on the image below. You can create a shortcut for the current user or for all users of the computer (circled in blue); by default “all users” is checked.

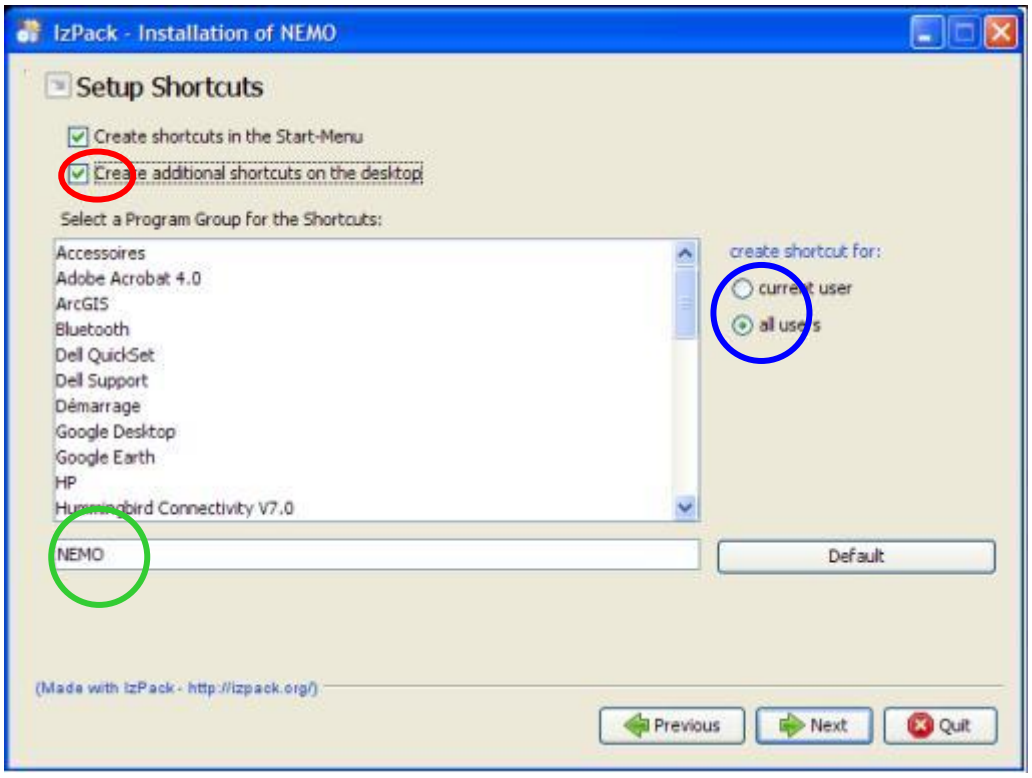
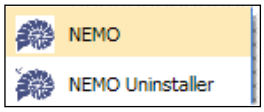


Figure 3 – Installation of NEMO – definition of shortcuts.

The shortcuts are created on the desktop and in the Start menu of the computer with the following icon:

on the desktop or 

in the start menu under the group defined in the circled green field in Figure 3.

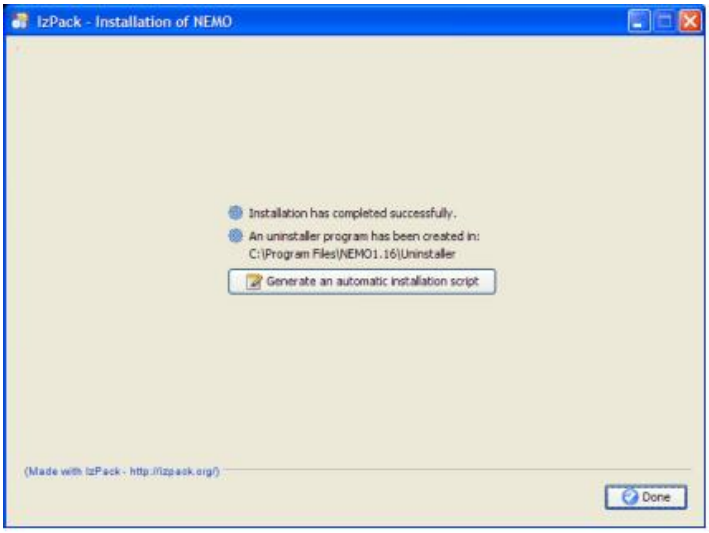


Figure 4 – Last screen of NEMO installation

If NEMO needs to be installed on several computers, it is possible to "Generate an automatic installation script", by clicking on the appropriate button on the last screen of NEMO installation (Figure 4).

3.1.2. Installation for Linux

Get NEMO software from the SeaDataNet Web site, under Standards & Software:

https://www.seadatanet.org/standards_software/software/nemo

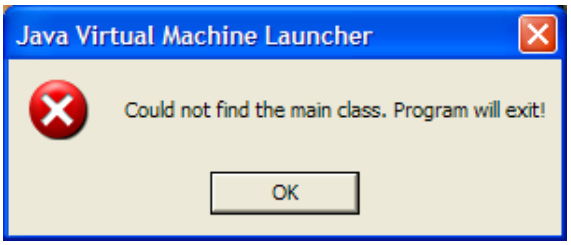
1. Copy the Linux, Linux64bits zip file on your computer, and unzip it (tar -xzf file.tar.gz).
2. You will get 2 files: install_nemo.jar and launcher_nemo.sh
3. If Java is not installed on your computer (see chapter 1.3), install it.
4. To install NEMO, run launcher_nemo.sh or type java –jar install_nemo.jar. See paragraph 3.1.1 to proceed to the installation.
5. To run NEMO, run ./launcher_nemo.sh

3.2. NEMO uninstallation

3.2.1. Uninstallation for Windows

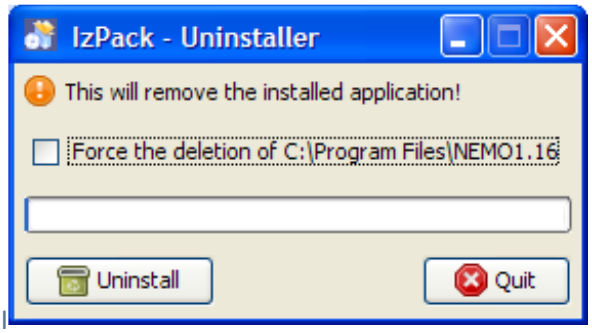
If you want to remove NEMO from your computer, run the uninstaller by selecting NEMO Uninstaller in the start menu of your computer (see paragraph 3.1).

If running the uninstaller generates the following message:



please run C:*NEMO_Installation_directory*\Uninstaller\launcher_uninstaller.bat (or unsinstall_nemo.sh for Linux).

The following window opens:



Click on Force the deletion of C:*NEMO_Installation_directory*

And then click on Uninstall.

3.2.2. Uninstallation for Linux

If you want to remove NEMO from your computer, run the uninstaller by using the following command in the Uninstaller directory:

./uninstall_nemo.sh

4. Controlled vocabularies

NEMO includes functionalities to import SeaDataNet controlled vocabularies, EDMO (European Directory of Marine Organisations) catalogue, EDMERP (European Directory of Marine Environmental Research Projects), and some information from IFREMER database useful for MEDATLAS format (such as a subset of Roscop codes corresponding to sensors available on NERC/BODC vocabulary or format and default values for MEDATLAS parameters).

SeaDataNet-controlled vocabularies used by NEMO are available at the following address: http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp

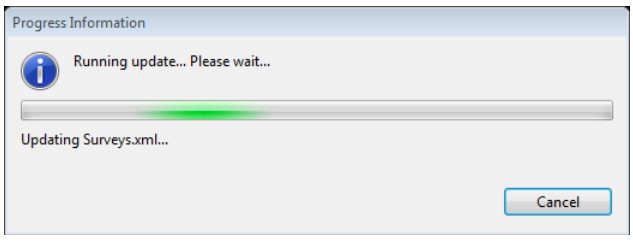
NEMO uses the following lists:

List code	List Name
C16	SeaDataNet Sea Areas
C17	ICES Platform Codes
C18	IOC country codes
C19	SeaVoX salt and fresh water body gazetteer
C77	SeaDataNet Cruise Summary Report data categories

L05	SeaDataNet device categories
L06	SeaVoX Platform Categories
L07	SeaDataNet data access mechanisms
L08	SeaDataNet Data Access Restriction Policies
L20	SeaDataNet measurand qualifier flags
L22	SeaVox Device Catalogue
L23	SeaDataNet Metadata entities
L30	MEDATLAS Data Centres
L33	WMO C3 vocabulary of XBT data types
P01	BODC Parameter Usage Vocabulary
P02	BODC Parameter Discovery Vocabulary
P06	BODC data storage units
P07	Climate and Forecast Standard Names
P09	MEDATLAS Parameter Usage Vocabulary
C16-C19	Mapping between C16 and C19
L05-C77	Mapping between L05 and C77
P01-P02	Mapping between P01 and P02
P01-P09	Mapping between P01 and P09
P02-P09	Mapping between P02 and P09 for CDI summary
P06-P01	Mapping between P06 and P01
P06-P09	Mapping between P06 and P09
P07-P02	Mapping between P07 and P02
EDMO	European Directory of Marine Organizations
EDMERP	European Directory of Marine Environmental Research Projects
CSR	CSR list for mapping between LOCAL_ID un central ID of the CSR
Parameters	Idem than P09 with the default value and format information
Surveys	Use by IFREMER for server initialisation on the Cruise step

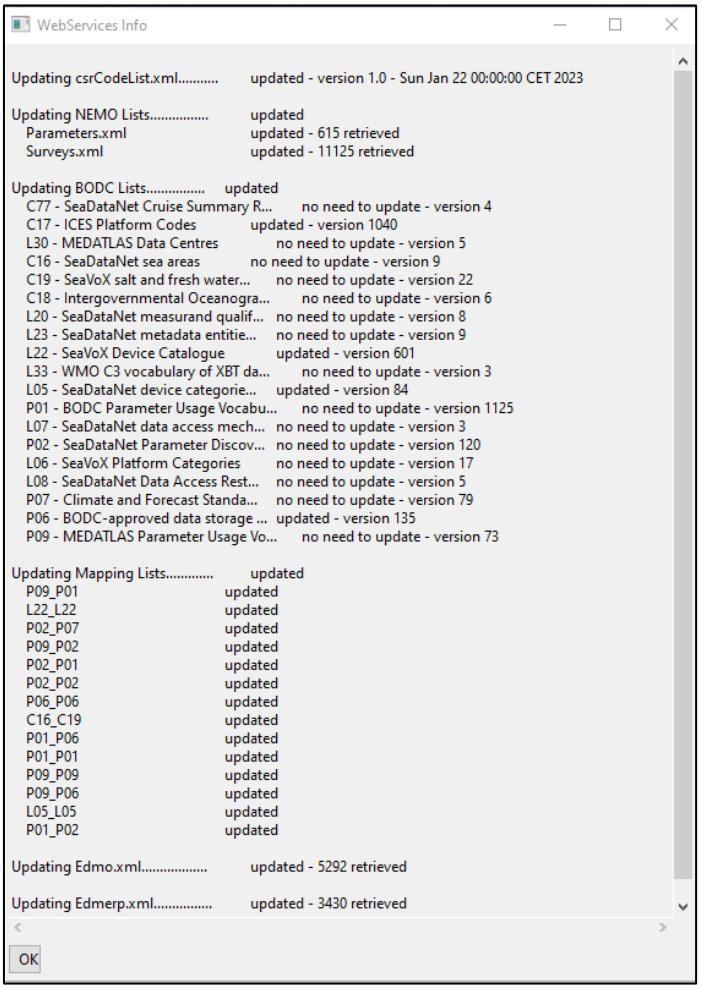
When running NEMO, the controlled vocabularies can be downloaded when using the menu “Options” and “Vocabulary update”.

A window shows the progression of the update, where you can see the name of the list which is updated, and its rank among the total list to be updated:



While updating is running, it is possible to stop it by pressing the “Cancel” button; NEMO tells which lists have been updated and where the update was interrupted.

At the end of the updating process, a summary is displayed:



For the lists which have a version number, NEMO tests if the present version number of a given list has changed since the last update of NEMO vocabulary lists. If no, “no need to update” is mentioned in the summary.

In the Web services info window, if FAILED is mentioned in front of a category of a list (CSR, NEMO, BODC lists, Mapping EDMO, or EDMERP), it means that:

- NEMO is not able to connect to BODC, Maris, or Ifremer web services or
- no internet connection available on your PC at that moment or
- the firewall of your organization prevents such connection (please contact your network and security team) or
- the connection for your PC to the internet is not direct but is established through a proxy (in that case see §9).

5. Common functionalities

5.1. Global description of NEMO's main screen

NEMO's main screen is divided into 3 parts that are described in the sections below.

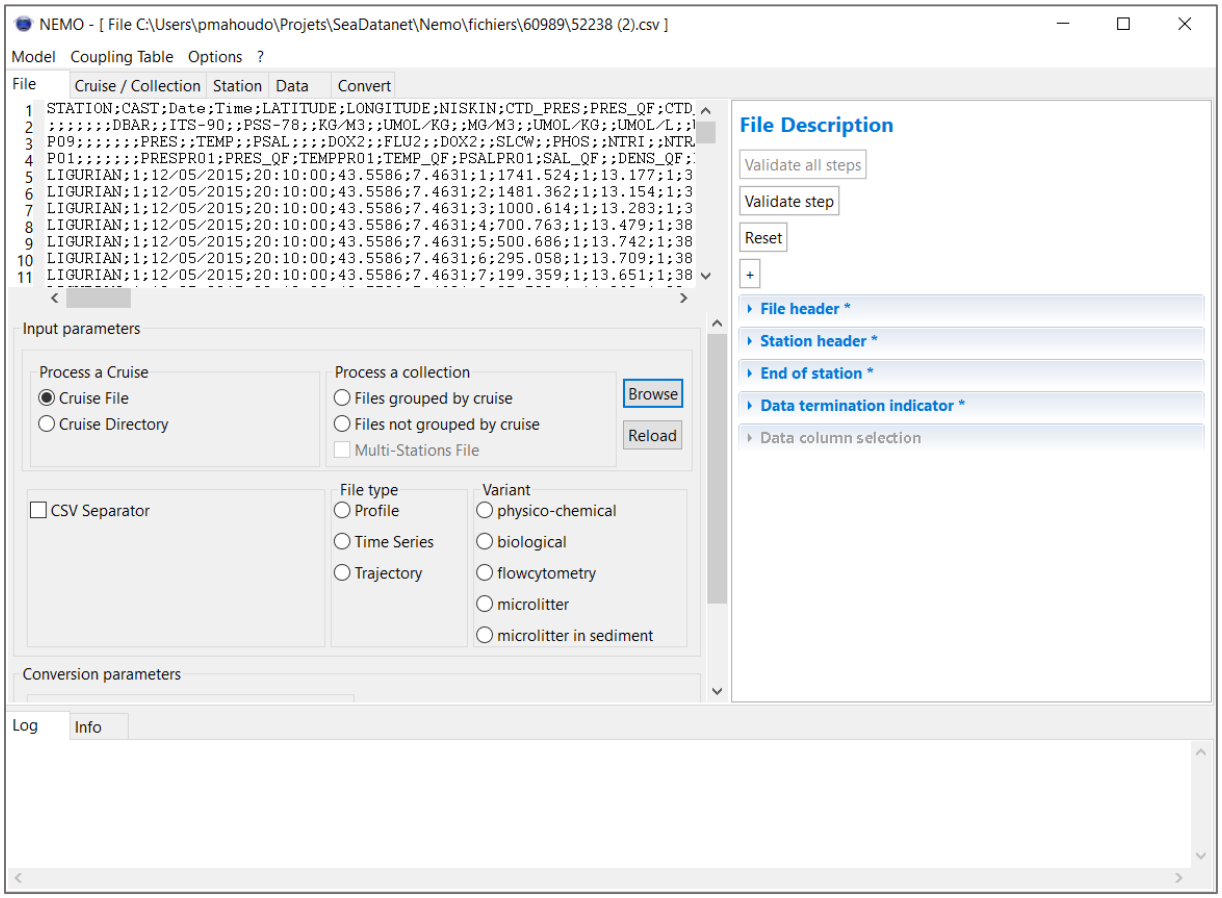


Figure 5 - NEMO main screen

5.1.1. Left part of the NEMO Screen

In this left part are the different tabs of NEMO, used to describe the input file(s) (see chapter 7). It is divided into 2 sub-parts, the upper one is used to display the input file, and the lower one is used to input some information about the file.

The input file is displayed on the 4 first tabs on NEMO so that the user can visualize and directly select information in the input file (see chapter 5.2).

5.1.2. Right part of the NEMO screen

The right part is used to describe metadata in the input file. It is also on this part that the user can validate or reset each step of the description.

5.1.3. Bottom banner of NEMO screen

5.1.3.1. Tab “Log”

This tab gives information about the validation of a step in NEMO or about the data conversion in the last step of NEMO.

If the information is an error, it is written in red, if not it is written in green.

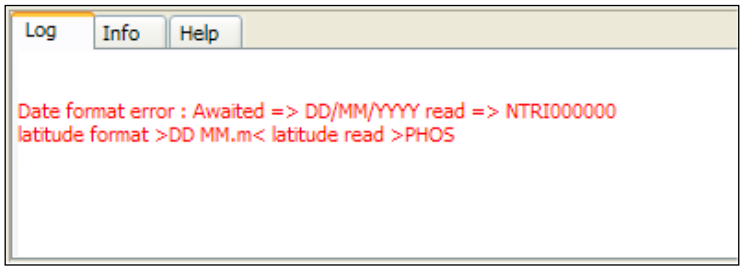


Figure 6 – Example of an error message

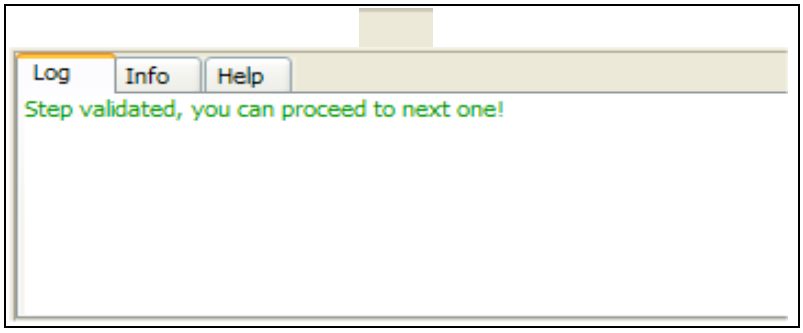


Figure 7 - Example of an informative message

5.1.3.2. Tab “Info”

This tab gives information on the input file or the input directory, and also on the used model if a model has been loaded.

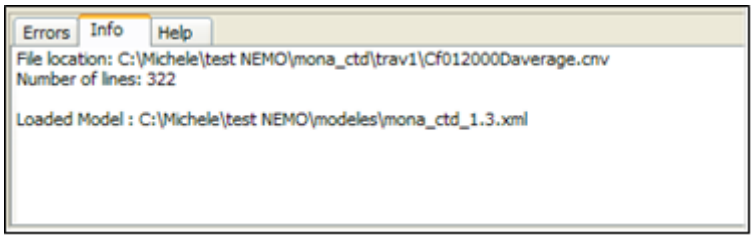


Figure 8 - Example of content of the Info tab

5.2. Set “Button”

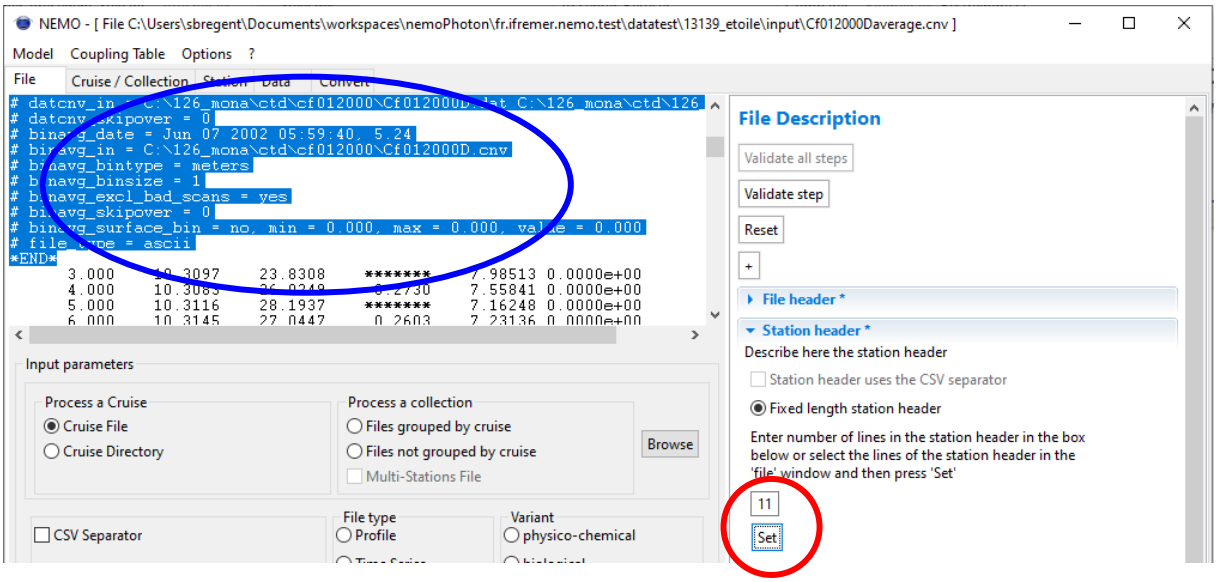
One principle of NEMO for the description of the input file(s) is to select the information in the left part of the screen (where the input file is displayed) and then press the “set” button:

- to input the number of selected lines or

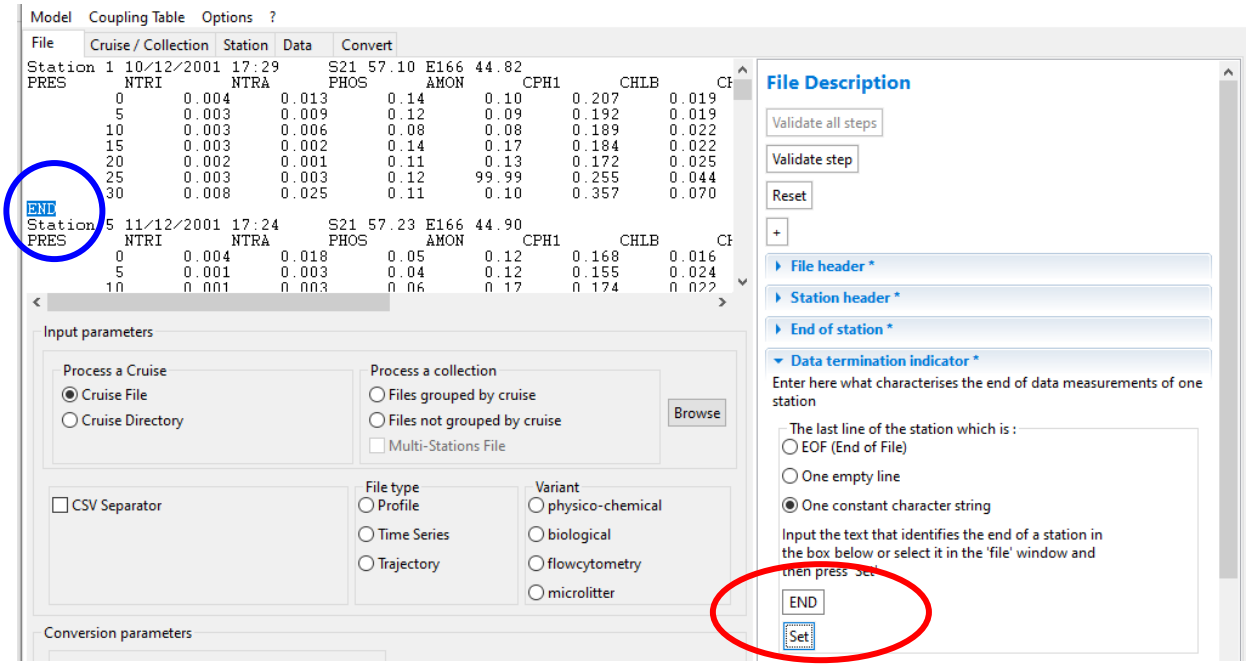
- to input the selected text or
- to input the position on the information (number of the line in the file, and the start and end character on the line).

Example:

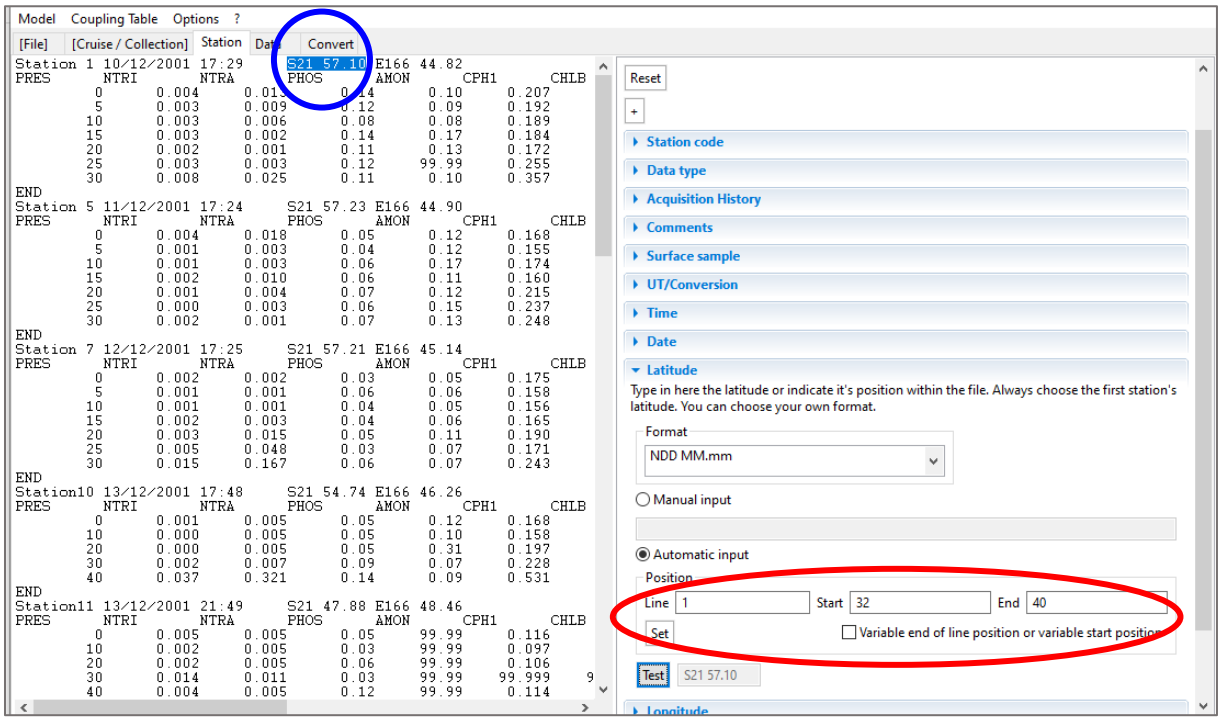
Number of lines in the station header: *The lines of the station header are selected on the left side of the screen (circled in blue), then when pressing the set button, the number of lines is set in the field (circled in red).*



Text in Indicator of end of data: *The text which indicates the END of data is selected on the left side of the screen (circled in blue), then when pressing the set button, the text is set in the field (circled in red).*



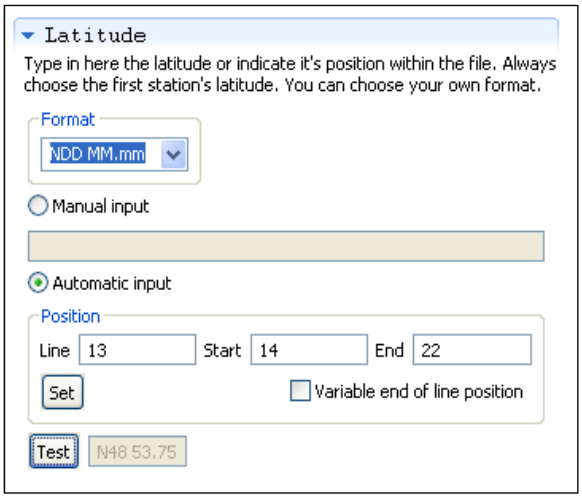
Position of the latitude in the station header: *The latitude value is selected in the left side of the screen (circled in blue), then when pressing the set button, the line and the start and end characters are set in the fields (circled in red).*



5.3. The “Test” button

This button is used to verify that the input information is correct. It works for manual and automatic input.

In the example below, the user uses automatic input, he tells NEMO to read the latitude on line 13 of each station header from character 14 to character 22 at format *NDD MM.mm.* Clicking on “Test” displays the value of latitude read by NEMO and translates it to the fixed MEDATLAS format so that the user can check that the value is correct and that he did not make any input error.



5.4. The “Validate step” button

The 5 steps of NEMO have to be done sequentially; it is not possible to start with the “Cruise” or “Station” tab, for example. It is not possible to go directly from the “File” tab to the “Data” tab.

To go from one step to another one, the NEMO user has to click on the “Validate step” button, on the top right part of the NEMO window.

Then NEMO makes some checks: on format, on mandatory fields…

If no error is detected, the current step is validated and it is possible to move to the next one. A green informative message is written in the error window: “Step validated, you can proceed to next one”, and brackets appear on the tab name:

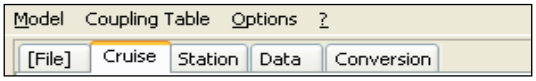


Figure 9 – [File] step is validated, the current step is Cruise description not validated yet

If errors are detected, the step is not validated and it is not possible to move to the next one. NEMO user has to read the error message, correct the input and try to validate again.

5.5. The “Validate all steps” button

The “validate all steps” button is only available in the File folder when input file(s) and a validated model have been loaded.

This button allows validating all the steps of NEMO to go directly to the Convert folder for data conversion. It is very useful if the user runs NEMO several times with the same model.

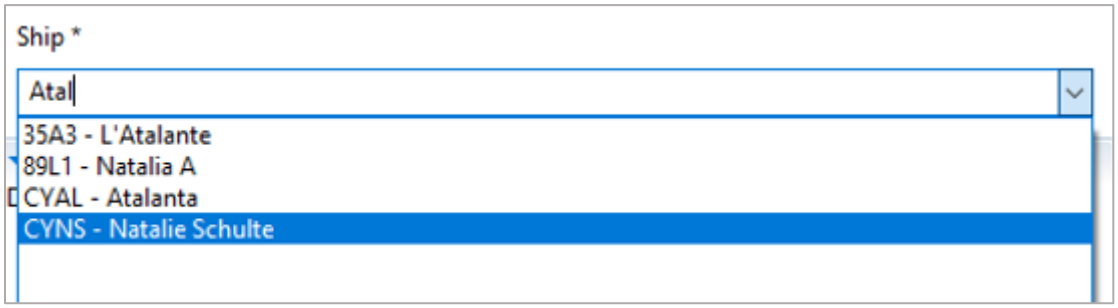
5.6. The “Reset” button

The “Reset” button is used to reset the current step: it puts back the values to empty or default values in all the fields of the current window.

If the step was previously validated, by clicking on the “Reset” button its status moves back to “not validated”.

5.7. Search function

For the files linked to a list of values like SHIP, Sea region, Country, and Data Centre: typing in the field will filter the list with the characters input like for example for the SHIP: where all ships containing ‘**atal**’ are listed



6. NEMO settings

NEMO needs some settings to be able to convert the files, **these settings need to be defined before the first run of NEMO, using the Menu "Options'> "Settings".**

This opens the following window:

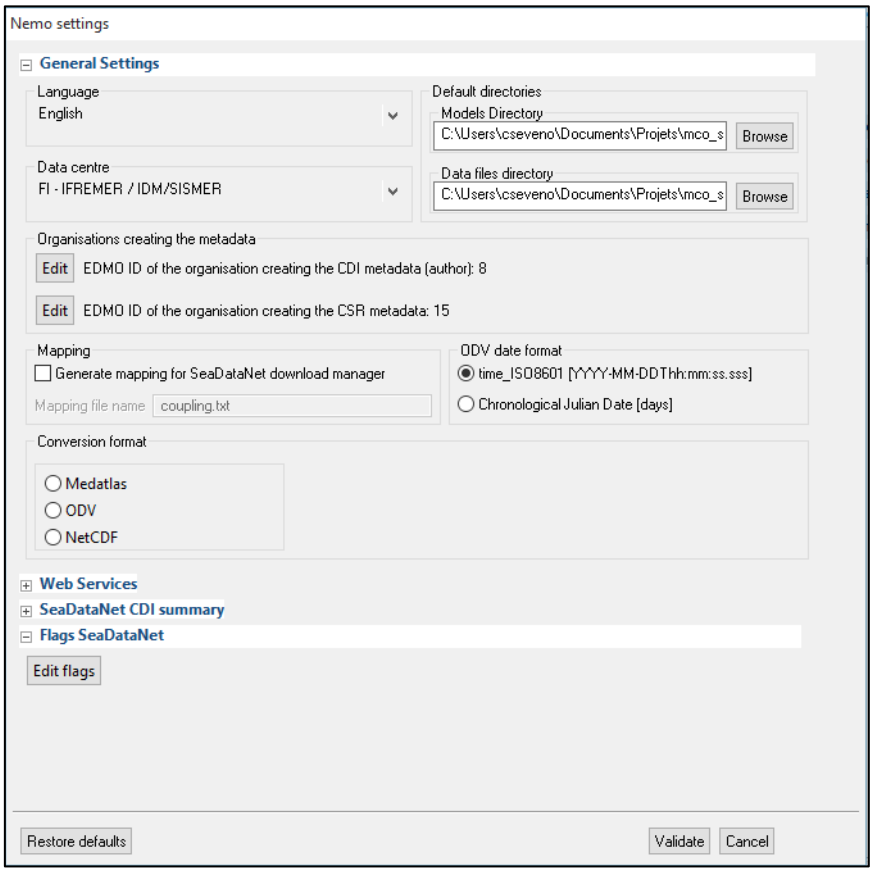


Figure 10 - Main NEMO Settings window

Clicking on "+Web Services" opens the following fields:

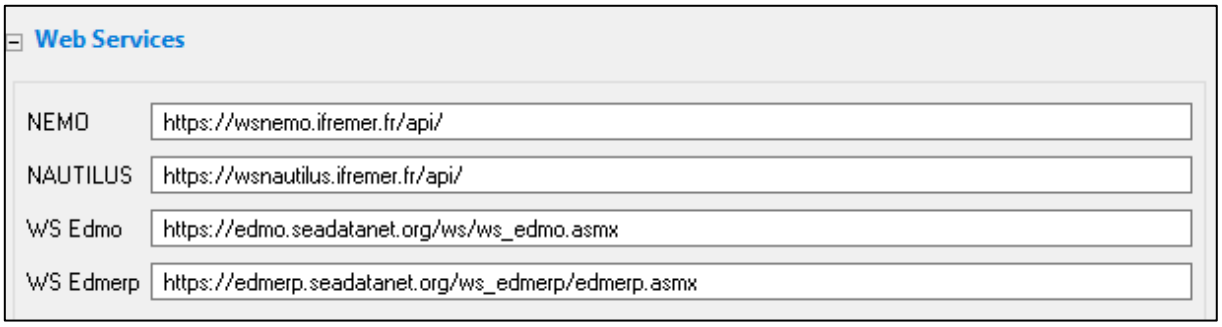


Figure 11 - NEMO Settings window, Web services information.

Clicking on "+SeaDataNet CDI summary" opens the following fields:

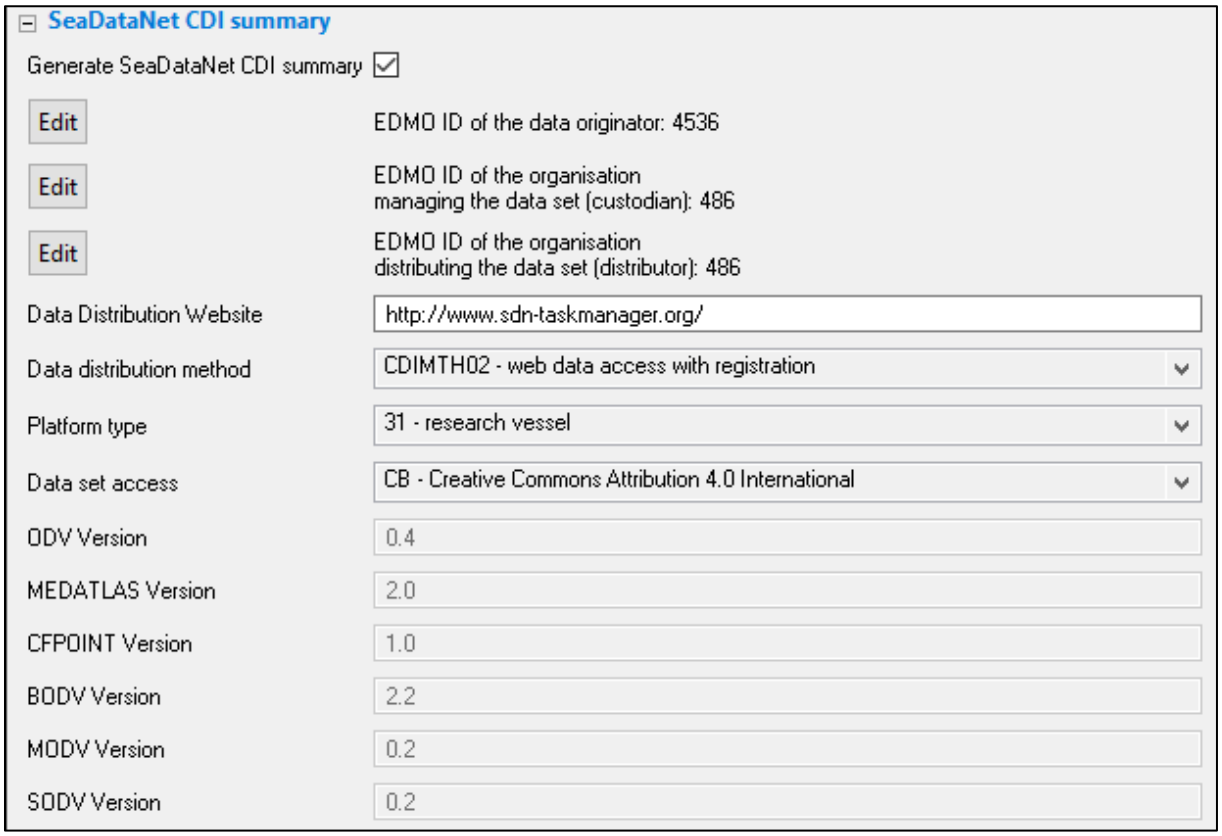


Figure 12 - NEMO Settings window, CDI summary information

6.1. Default language

NEMO is bilingual (English – French) and the default language may be changed here. To be taken into account, once the language has been changed, the user has to quit and restart NEMO.

6.2. Default data centre

The *Data centre* is the MEDATLAS code (SeaDataNet common vocabularies – List L30) of the data centre which manages the data (used only in MedAtlas format).

6.3. Default directories

Default directories have to be defined for the models and the data files. These directories will be used by default when opening browse windows for data files and models.

6.4. CDI Author

The EDMO ID of the organisation creating the CDI metadata is mandatory because it is the EDMO code of this organisation and the LOCAL_CDI_ID which determine the iniquity of a CDI record.

6.5. CSR Metadata

EDMO ID of the organisation creating the CSR metadata. This EDMO code is needed to use a local CSR Identifier to create a CSR reference (see §7.2.2.1).

6.6. Mapping and Coupling table

If the "Generate mapping for SeaDataNet Replication Manager" check-box is clicked, NEMO will insert all the converted stations LOCAL_CDI_IDs in a java database included in NEMO software. This coupling table gives the mapping between the unique identifier of a CDI element (LOCAL_CDI_ID which corresponds to a vertical profile, a time series, or a trajectory) and the file in which this element can be found. It is managed by the "Coupling table" menu of NEMO (see paragraph 7.7).

6.7. ODV date format

For time-series in ODV output files, you have to choose a date format that can be either *ISO8601* or *Chronological Julian Date*; by default the format is ISO8601.

6.8. Conversion format

This menu enables the user to choose his default *Conversion format* which is available on the File tab when starting NEMO.

6.9. Web services

Web services are used for the "list of values" update, addresses are fulfilled by default when the software is installed and they should not be modified.

NEMO uses 4 different web services:

- NEMO Web services to update parameters (format and default values of MEDATLAS parameters), data types, and cruise lists
- NAUTILUS Web service is used by IFREMER only for "server initialisation" on the cruise step
- EDMO Web services to update the list of EDMO IDs.
- EDMERP Web services to update the list of EDMERP IDs.

If the internet connection makes use of a PROXY, check on "Use Manual Proxy Configuration" and fill in information according to your configuration. Please see chapter 9.

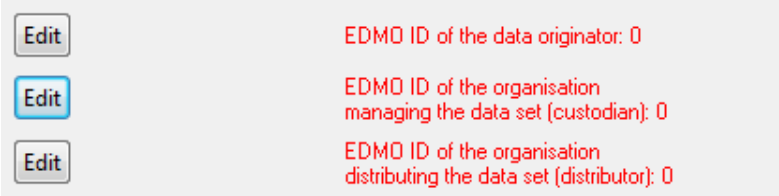
6.10. Default values for SeaDataNet CDI summary

NEMO can create a file that can be used by MIKADO to generate XML CDI files. If a CDI summary file is needed when using NEMO, the user has to click on the "Generate SeaDataNet CDI summary" checkbox and then input the mandatory CDI information.

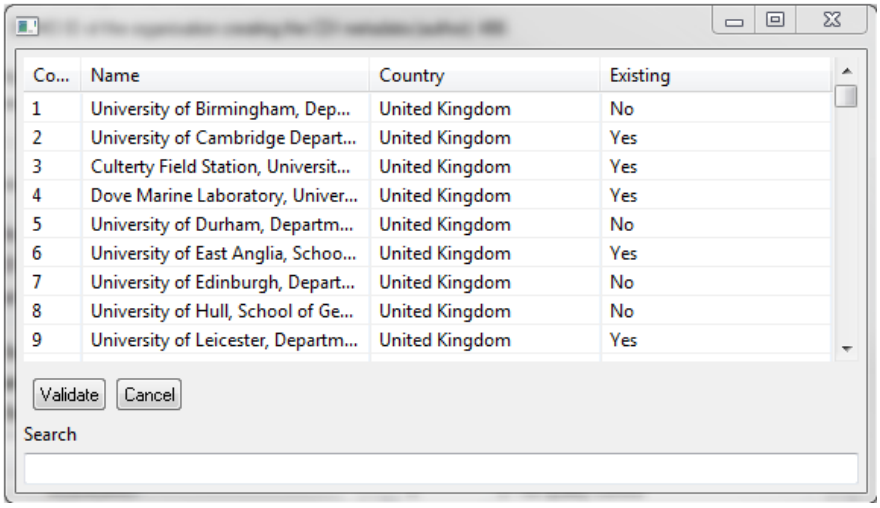
This CDI summary file needs information, which is defined by default in this part of NEMO settings. This CDI information may vary from one dataset to another and it is up to the user of NEMO to update this information if necessary.

These default values are, among others, the EDMO codes of the different organisations responsible for the data set(s): Data originator, data distributor, or data custodian. At present, the list contains around 1500 entries, so to help NEMO user to find a value in the list a search function has been developed.

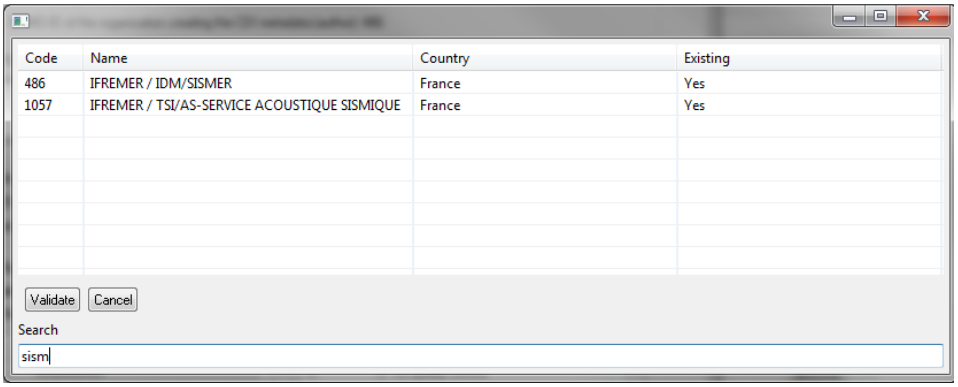
To open the search function, click on an Edit button…



…to open the search window:



Then the user can type in the "Search" field the character string he is looking-up, to filter the list of organisations (in the following example, looking up ‘sism’):



Two fields concern the data distribution:

- Data distribution Website: the default value http://www.sdn-taskmanager.org/ should not be changed; it is the address of the central CDI web interface, where SeaDataNet users will have to connect to search data.

- Data distribution method: gives the access mechanism of the data set. The list of values comes from SeaDataNet's common vocabularies (List L07) and gives the access mechanism for the data set.

Platform class: this mandatory field for CDI described the type of platform which has collected the dataset. The list of values comes from SeaDataNet's common vocabularies (List L06).

Data set access: this mandatory field for CDI described the data access restriction policies of the dataset. The list of values comes from SeaDataNet's common vocabularies (a subset of List L08).

6.11. Quality flags mapping to SeaDataNet flags

NEMO can convert input files with quality flags into SeaDataNet quality flags scale.

Different quality flag mappings can be used and safeguarded within NEMO software.

The flag window can be opened using the "Edit flags" button, in the Nemo settings window.

The flag window is divided into 2 parts: (i) on the top is the list of existing mappings, and (ii) on the bottom are the details of each mapping to the SeaDataNet quality flag scale.

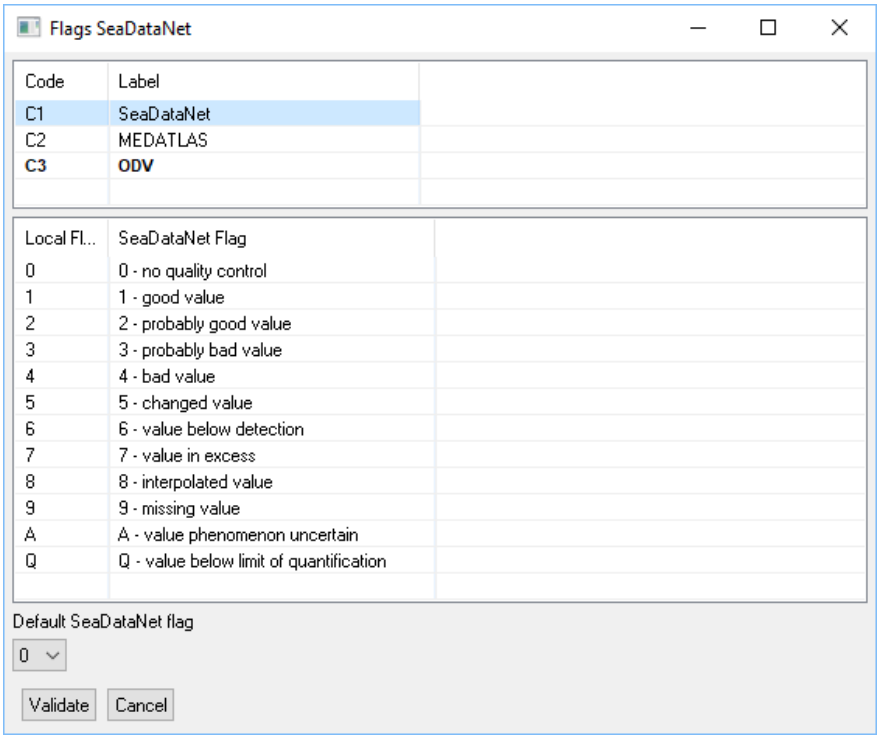
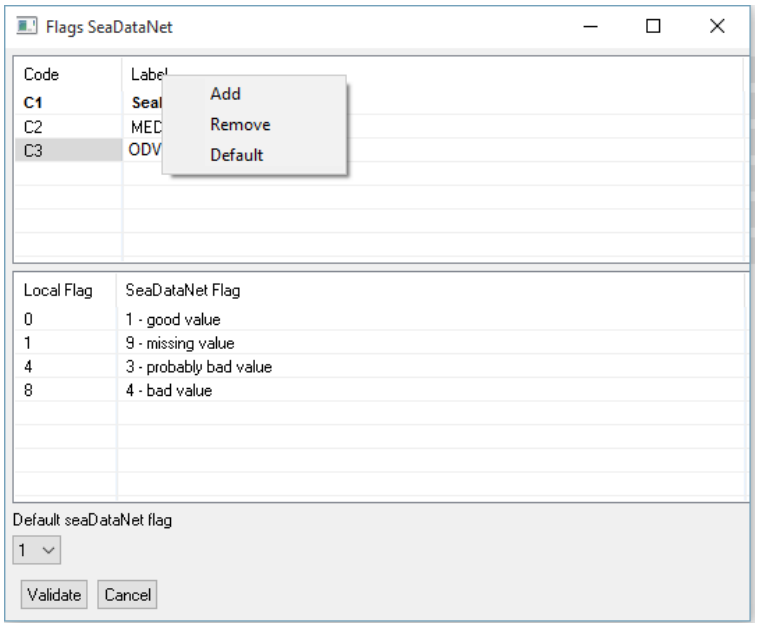


Figure 13- Mapping quality flag scale. On the top is the list of existing mappings, and on the bottom are details of the selected mapping

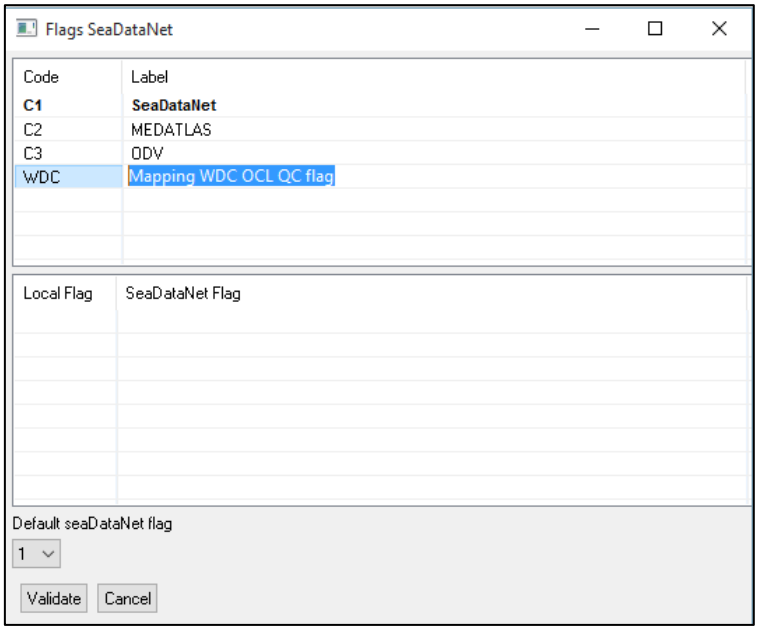
6.11.1. Add a new QC flags mapping

To add a new mapping:

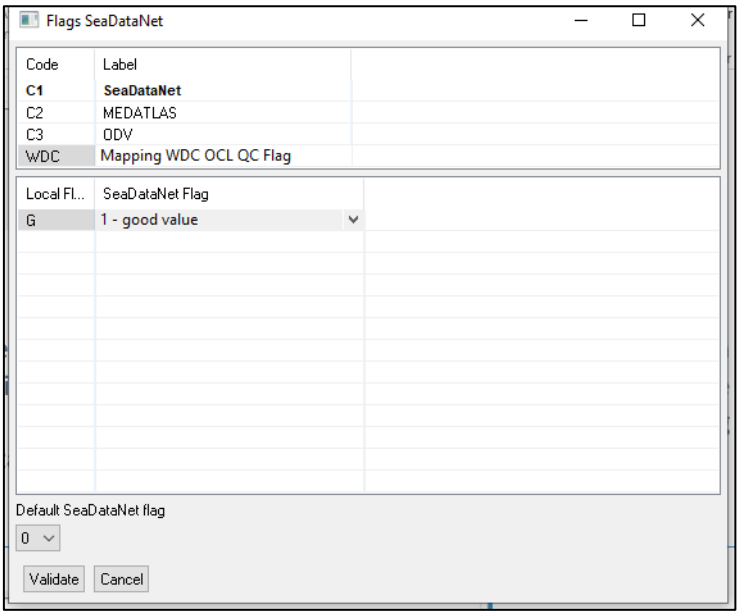
- right click on the list of mapping to open the contextual menu:
- click on "Add" to add a new line to the list of mappings :



- change the label of the new mapping :



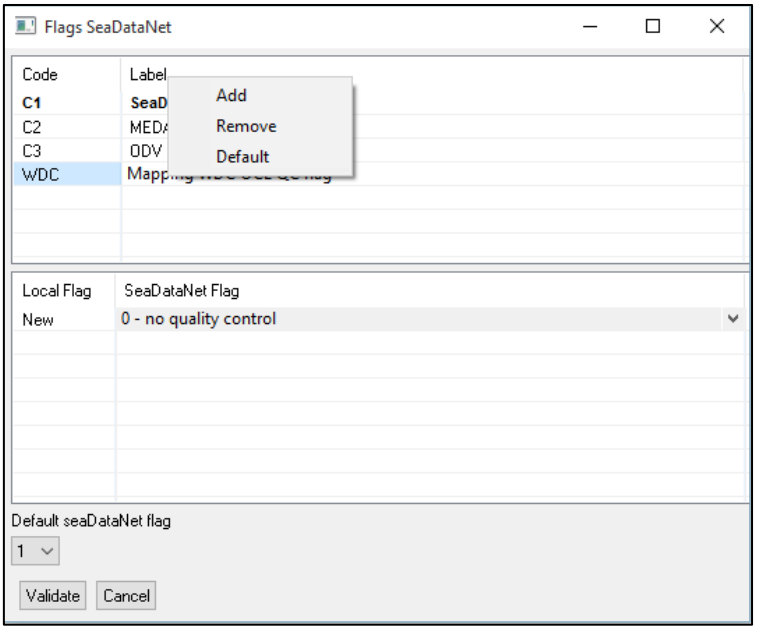
- Then in the bottom part of the window, enter the flag mapping (same principle as previously, right-click opens a window which allows adding or removing a line from the mapping table). Once a new line is created, the value of the local flag and the mapping between this local flag and the SeaDataNet QC flag need to be input as follows:



6.11.2. Remove an existing QC flags mapping

To remove an existing mapping:

- select the line corresponding to the mapping that needs to be deleted
- right click on the list of mappings to open the contextual menu :



- click on “Remove”

6.11.3. Define a default mapping for quality flags

To define a mapping « by default », right-click on the mapping in the mapping list and select Default in the contextual menu. The default mapping is written in bold characters in the mapping list.

IMPORTANT WARNING:

If you are using an existing model, be aware that the flag scale is loaded from the model and is not the default flag scale that you may have added or changed in the settings of NEMO after the loading of the model.

If you need to change the flag scale, create a new model or use a model with the same flag scale.

The mapping used in Nemo conversion will be displayed in the **Station description** step.

- If an existing model is used, the mapping is loaded from this model
- If no existing model is used, the mapping is the default one defined here.

6.12. Default SeaDataNet flag

By default when a file is converted to MEDATLAS, ODV, or netCDF format, all quality flags are set to 0 (No quality control).

Some users may know that the data that they want to convert have been checked and are all good, it is then possible to set the Default SeaDataNet flag to 1 or 2, so that in the output file of NEMO all quality flags will be set to 1 (good value) or 2 (probably good value).

6.13. Restore defaults

Restore initial configuration values. **This action can't be canceled.**

6.14. Exit NEMO settings

There are 2 ways of exiting the NEMO settings window:

- click on Validate to save changes and exit the settings window, or
- click on Cancel to exit without saving the changes.

Note that you need to quit and re-start NEMO to take into account new quality flags mappings at the Station step.

7. Running data file conversion

To convert input file(s), the NEMO user has to proceed with 5 steps, which correspond to the 5 tabs in the NEMO interface:

1. Describe the type of file and the type of measurements (File Tab)
2. Describe the cruise or the data collection (Cruise Tab)
3. Describe the station information (Station Tab)
4. Describe the measured parameters (Data tab)
5. Convert the input file(s) (Convert Tab)

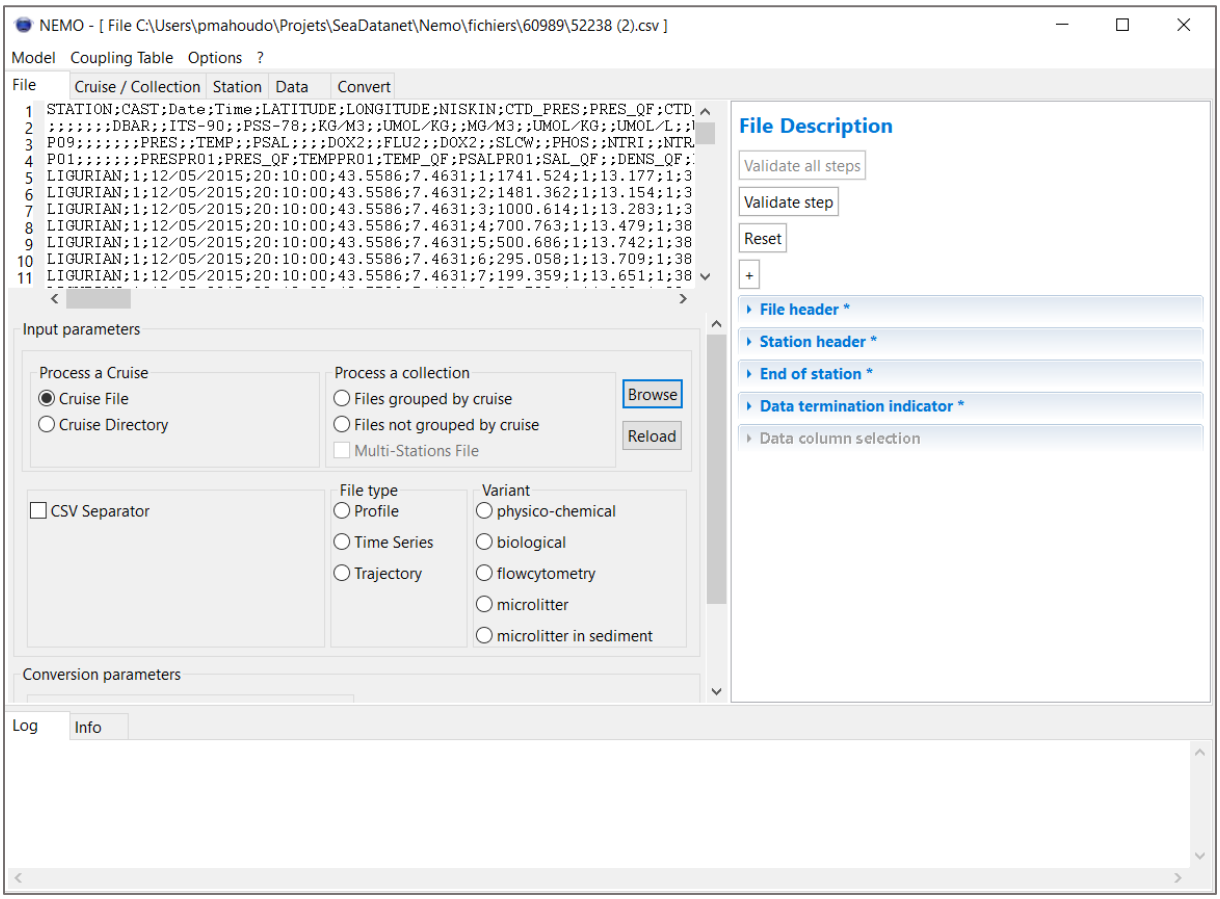


Figure 14- Main screen of NEMO with the 5 tabs corresponding to the 5 steps of conversion

In this chapter, we describe each of these steps.

7.1. File description

7.1.1. Very important requirement

NEMO can translate almost any kind of ASCII format, but in one execution, NEMO will convert only similar files: the files are homogeneous (same data type: e.g. CTD or Bottle but not both), the information must be located at the same place in all the files that NEMO will reformat in one execution.

Examples:

- If a user wants to reformat the CTD, bottle, and current meters of one cruise, he will have to run NEMO three times: one for CTDs, one for bottles, and another one for current meters.
- If a user wants to reformat a set of XBTs collected during several cruises :
    - The user can do it in one execution if all the XBTs have the same input format.
    - The user must run NEMO three times if he has 3 different input formats of XBTs (SIPPICAN, DEVIL, and SPARTON)

7.1.2. Description of the type of input file(s)

The “File” step consists first of a high-level description of the file(s) that needs to be converted: this description is included on the left side of the “File” window.

The first step is to describe the type of dataset that is going to be converted (=input files):

- Are the data related to **one** cruise (Process a Cruise)?
  - If yes, is it one file for one cruise (one file for all stations)?
  - Or, is it a set of files in one directory (one file for each station)?
- Are the data related to **several** cruises (Process a collection)?
  - If yes, are they grouped by cruises (one directory per cruise)? Or
  - Are they not grouped by cruise (one directory with all the files of all cruises)?
  - Are the files multi-station files or not?

  In case of data conversion related to a collection of cruises or a collection of stations, cruise metadata which are mandatory in MEDATLAS are not available, so data conversion in MEDATLAS is not allowed; only conversion to ODV and netCDF will be available in “Conversion” parameters part.

Once the previous information is given, the user gives the path to the input file(s) to NEMO, using the “Browse” button, and the first file of the first input directory (in case of multiple files) or the specified file (in case of one unique input file) is opened in NEMO window:

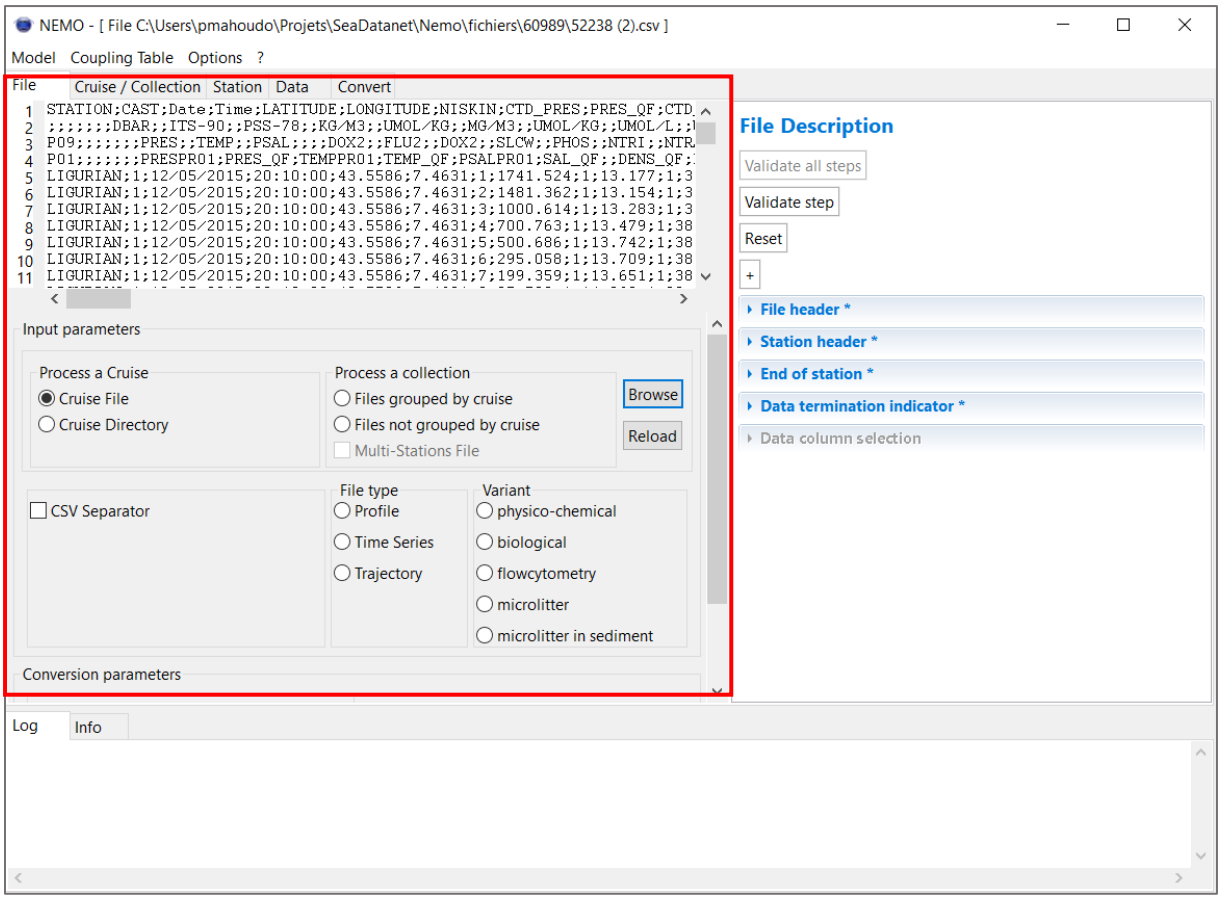


Figure 15– File description screen of NEMO – Left part (in red) for the description of the type of input file(s)

Next, the user must declare if the file(s) contains separators (and which one) or not.

Remark: In the case of a data file with separators, if the data are not displayed as a table (i.e. “use a table to display data” is checked in the Data column section), NEMO will rewrite the files without separators before moving to the next step. During this stage of rewriting the files, an informative message is written in the log window (with progression bars on Data analysis and writing files). The files are rewritten in a directory called *PF_*[*name of the input directory*].

Next, NEMO needs to know if the files are related to vertical profiles, time series, or trajectories (or none of them, for biological, flow cytometry, or microlitter variants).

If you want to generate ODV variants (biological, flow cytometry, or microlitter), choose the appropriate one in the Variant section.

Finally, the user chooses the conversion format:

- choose between MEDATLAS, ODV, or netCDF format by checking the appropriate box (depending on previous parameters, some formats can be disabled)
- Choose if you want to convert into “One file per station” or to “One unique file for all stations” by checking the appropriate box
- check the “Sort data within stations by increasing reference parameter (Pressure or time)” button to be sure that the measured parameters are sorted by the reference parameter in the output file. **Be careful that doing so you can mix up and down casts CTD data for example.**

The ***RELOAD button*** allows one to reload an input file after a change without having to re-open the model.

7.1.3. Description of the file(s)

Once the type of file has been described, the user must describe the file itself, this second part of the “File” step is included on the right side of the “File” window:

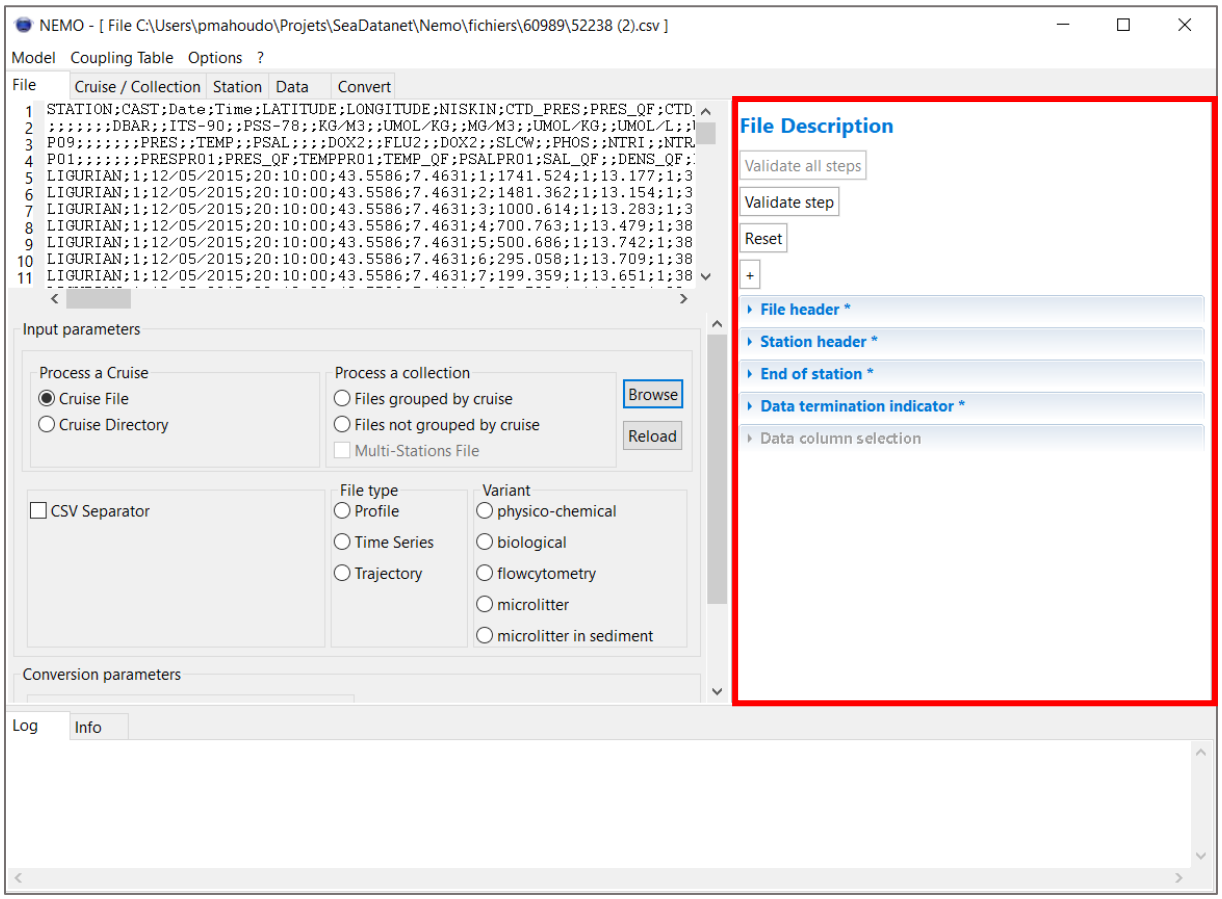


Figure 16– File description screen of NEMO – Right part (in red) for the description of the input file(s)

4 information need to be fulfilled for a text file without separators, if the file is a CSV file (File header, Station header, End of station, Data termination indicator), a 5th information will have to be fulfilled (Data columns selection).

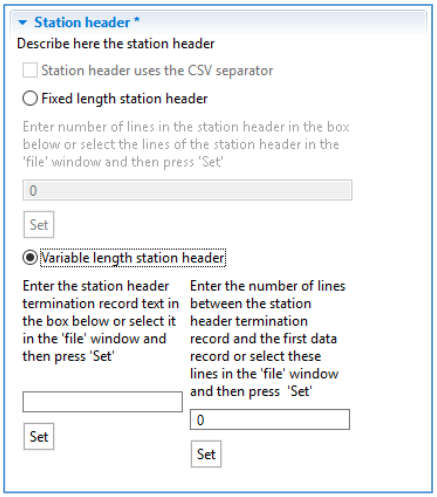
7.1.3.1. File header

This field describes the number of lines of the file header. A file header is generally present when it is a multi-station file, and there are some lines at the beginning of the file which are related to all the stations. **These lines are not repeated in the file.**

The number of lines of the file header can be input manually or selected in the left part of the screen in the file and then input through the “Set” button (cf. paragraph 7.2.2.1).

This number of lines can be different from zero only if you selected “Cruise File” in the description of the type of input file(s).

7.1.3.2. Station header



This section describes the station header.

When data contains separators, station headers may not have separators. In this case, let the “Station header uses CSV separator” unchecked.

Usually, the station header can be described by its number of lines, if it is constant from one station to another. A station header is a set of lines containing information on the station. These lines are the lines before the data lines; they are repeated for each station.

The number of lines of the station header can be input manually or selected in the left part of the screen in the file and then input through the “Set” button (cf. paragraph 5.2).

If the number of lines of the station header changes from one station to another (there is a variable length of the station headers), the text that identifies the end of the station header (station header termination record text) must be described. If this text is not directly preceding the first data line, the user must indicate the number of lines between this text and the first data line. Both information could be input manually or selected in the left part of the screen in the file and then input through the “Set” button (cf. paragraph 5.2).

If there are no specific station header lines, let the value equal 0.

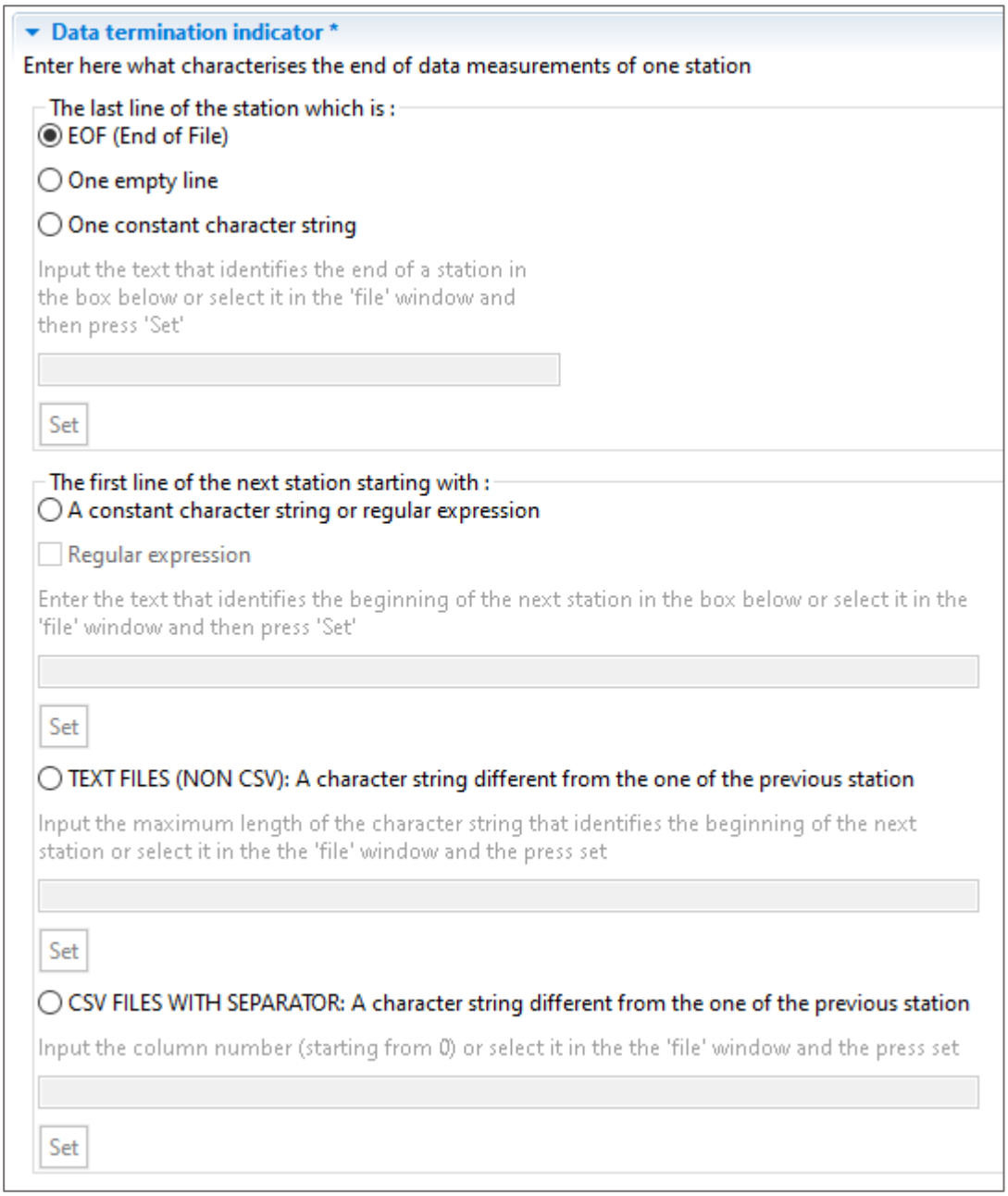
7.1.3.3. End of station

This field describes the number of lines at the end of a station. These lines may be present when it is a multi-station file and there are several lines between each station. **The data termination indicator (see below) must not be taken into account in this number of lines**, so if it is the only line between 2 stations, the number of lines at the end of the station must be set to zero.

The number of lines at the end of a station can be input manually or selected in the left part of the screen in the file and then input through the “Set” button (cf. paragraph 5.2).

7.1.3.4. Data termination indicator

This section describes the indicator of the end of a station in a file.



For single station files, most of the time the end of the file (EOF) is the indicator of the end of data, but it may be an empty line at the end of the file or a line with a specific text (*like in MEDATLAS file for example where the last line of a station is a line of default values, that must not be taken into account as measurements*) that can be input manually or selected in the left part of the screen in the file and then input through the “Set” button (cf. paragraph 5.2).

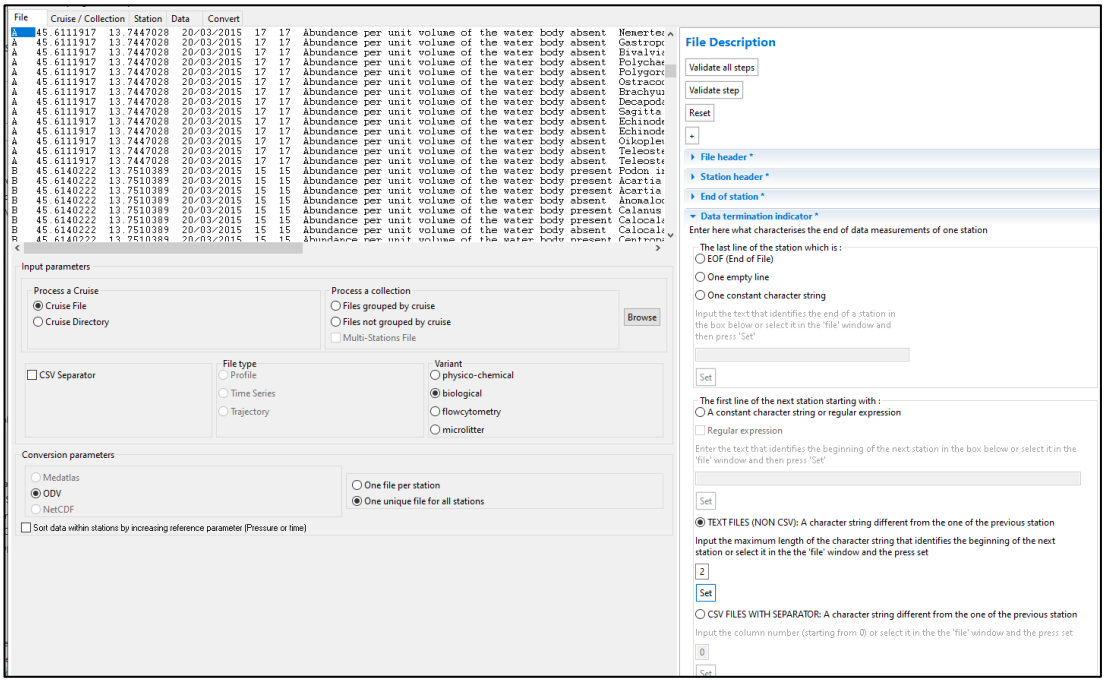
For multiple station files, Nemo needs information to be able to know that station is changing.

You can specify how the current station ends, or how the next station begins (if there is no separator between stations).

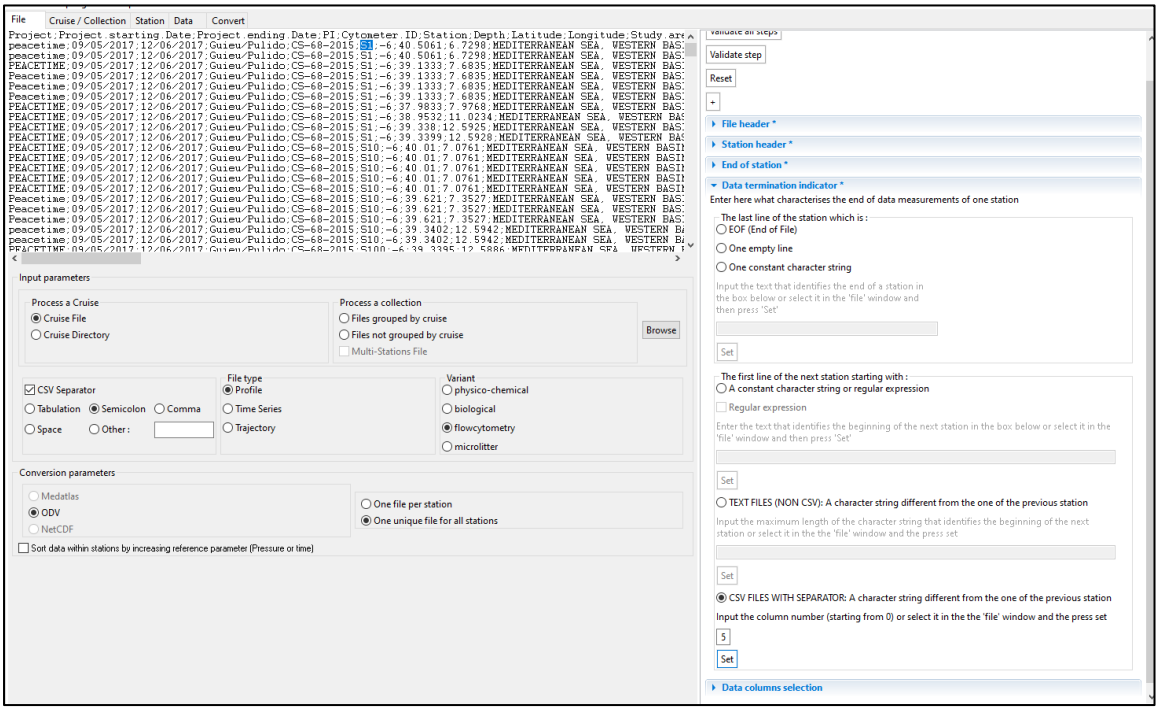
If you use a separator to indicate the end of the station, this separator can be an empty line or a set of specific characters that can be input manually or selected in the left part of the screen in the file and then input through the “Set” button (cf. paragraph 5.2).

If you do not use a separator, you can indicate how the next station starts in two ways:

- “a constant character string or a regular expression”, if all stations begin with the same character string or different character strings that can be defined by a regular expression
- For “TEXT FILES (NON-CSV) a character string different from the one of the previous station”, if all stations begin with a character string completely different that is present on each line. In this case, input the length of the character string that Nemo must compare between each line, or select the area in the left part and click on the “set” button.



- For “CSV FILES WITH SEPARATOR: a character string different from the one of the previous station”. If all stations contain a value completely different in a given column and present on each line. Input the column number (starting from 0) or select it in the ‘file’ window and press set.



Examples:

1/ in a MEDATLAS file, the data termination indicator is the line starting with "-999.9 99.999". Choose "One constant character string" and select it in the file window. It is not necessary to input all the lines; the first significant characters are enough.

2/ For ODV multiple stations file, the data termination indicator must be "**a constant character string or regular expression**", without checking "regular expression". In that case, NEMO needs to detect the text that identifies the beginning of the next station, which is a specific set of characters identifying the first line of all the stations in the input file. This text can be input manually or selected in the left part of the screen in the file and then input through the "Set" button (cf paragraph 5.2).

3/For a file like the one below:

```
110005110 3DANI90001004550N03312E690517120012200201000569
1100051202120000001580184601316580093 2       013   055
1100051203120000081550186401336624099 8       013   078
110005110 3DANI90002004552N03312E690517171517350200100569
1100051202171500001620184401307597096 8       006   077
1100051203171500081600184201309587094 7       013   077
110205110 3DANI90005004556N03315E690518144015000200110569
1102051202144000001760186901296566094 5       016   035
1102051203144000081700186401305593097 8       023   048
110855110 3DANI90018004627N03144E690521191019300200050569
1108551202191000001910173601162517088 2       013   050
```

The first two stations begin with the same string. But the third and fourth stations are not the same (in yellow").

In this case, the data termination indicator must be "**a constant character string or regular expression**", with checking "regular expression".

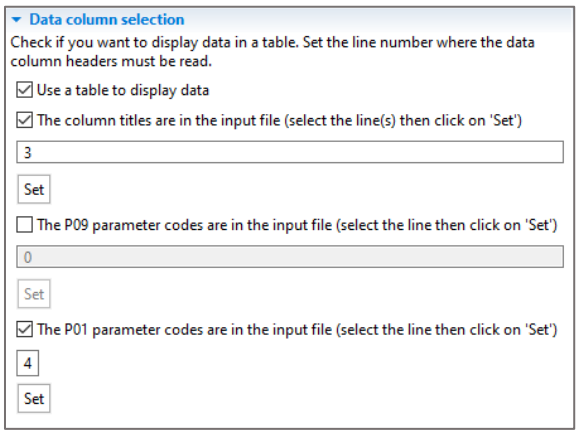
The regular expression to use here is "`110.*51103DANI`"

Where "." indicates "any character" and "*" indicates "0 or many times".

When the file description is over, click on the "Validate step" button (cf. paragraph 5.4) to move to the next step.

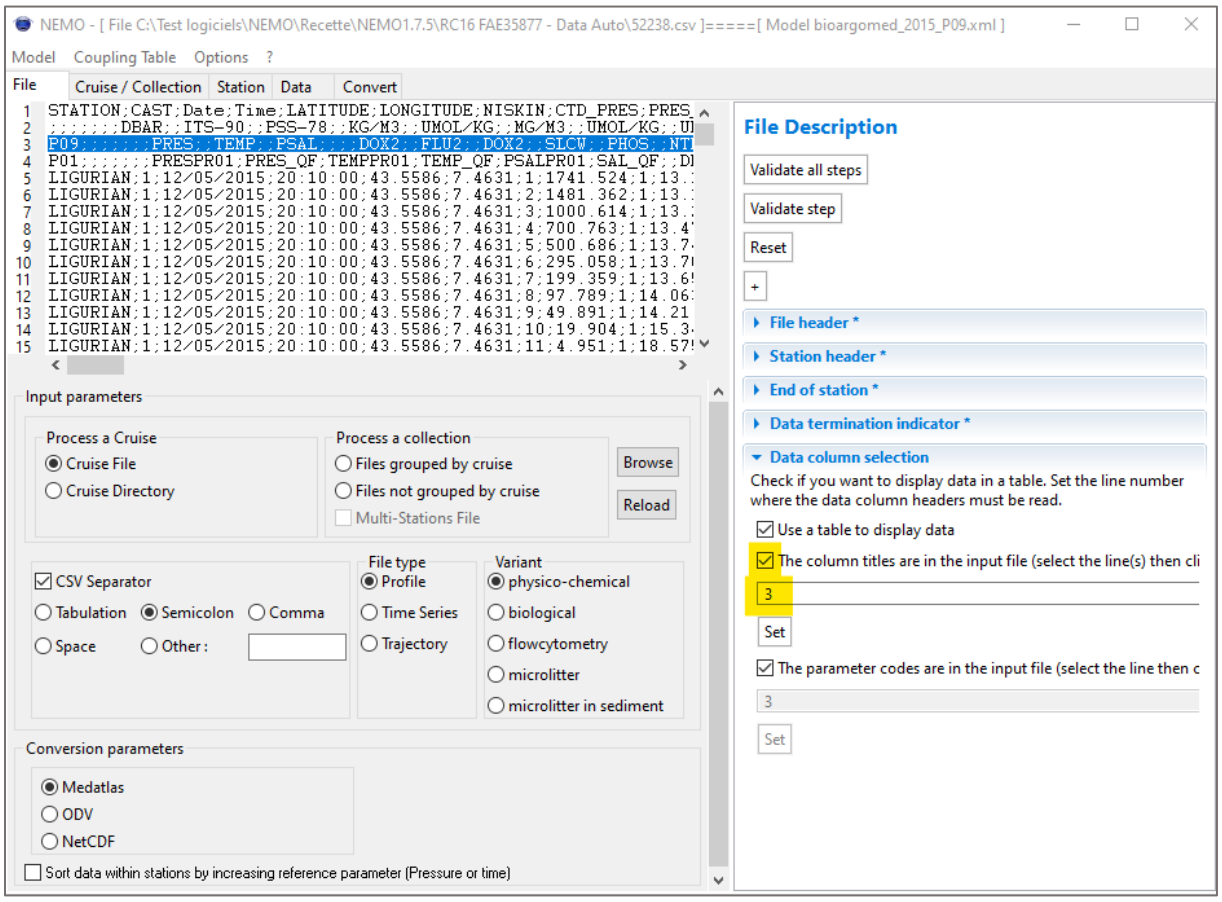
7.1.3.5. Data columns selection (only for CSV files)

If the file(s) are declared containing separators, the *Data columns selection* section is enabled:

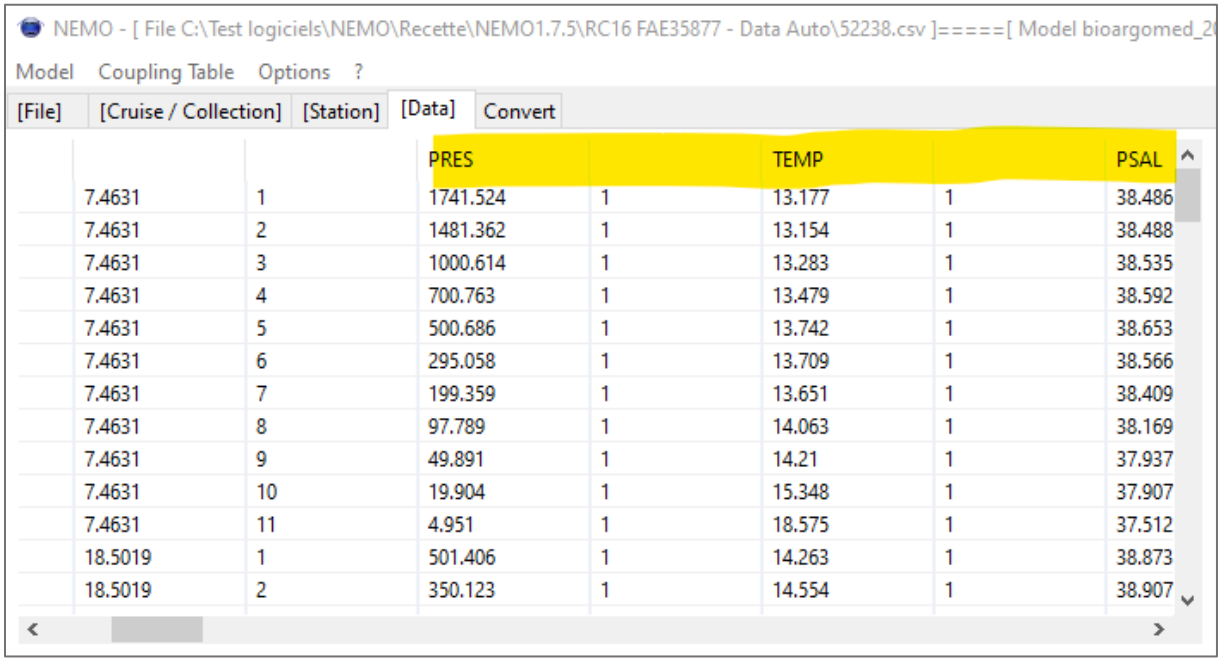


Check “use a table to display data”, to display data in a table (instead of raw text) in the Data tab.

If the file(s) contains the parameter names as column titles, check “The column titles are in the input file”, select the line containing the titles, and click on “Set”. This will allow NEMO to put a column title in the data tab like below, where the 3rd line of the file is selected:



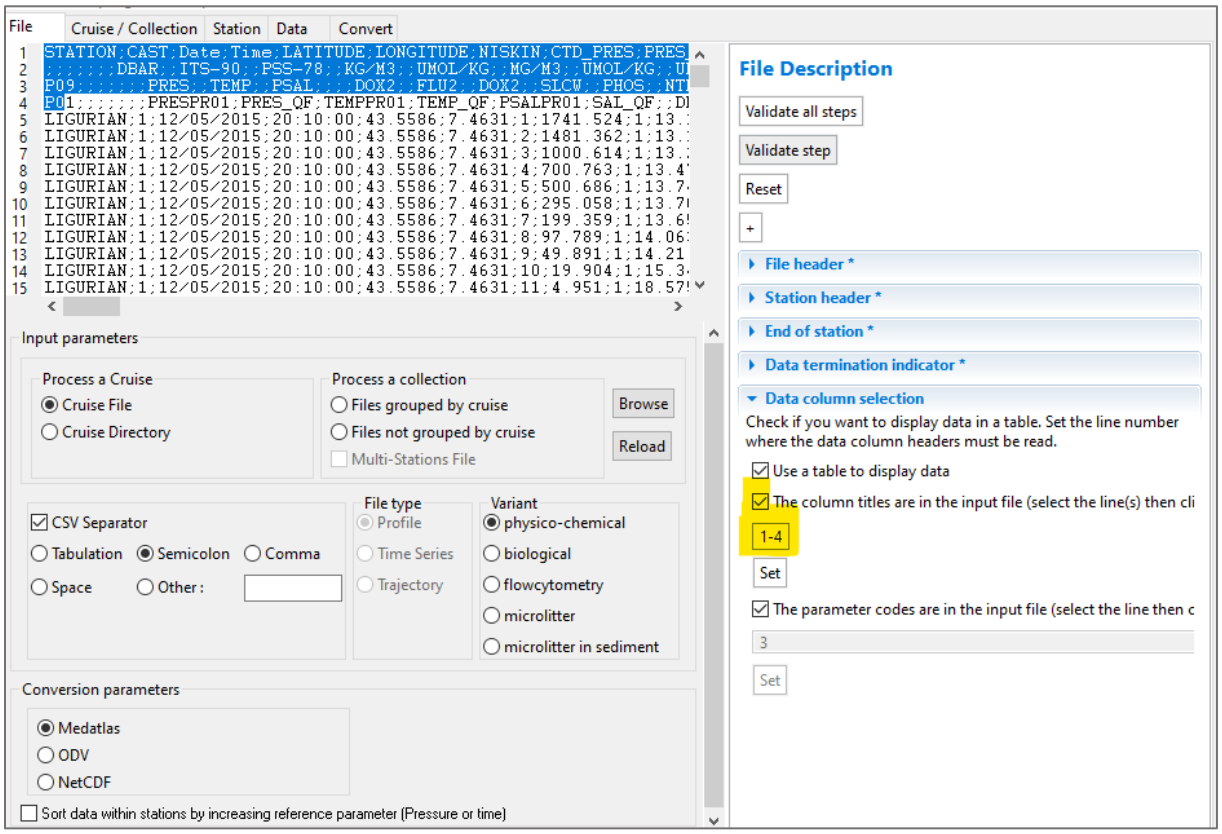
Which results in the following data screen, the title of the columns are from line 3 in the file:



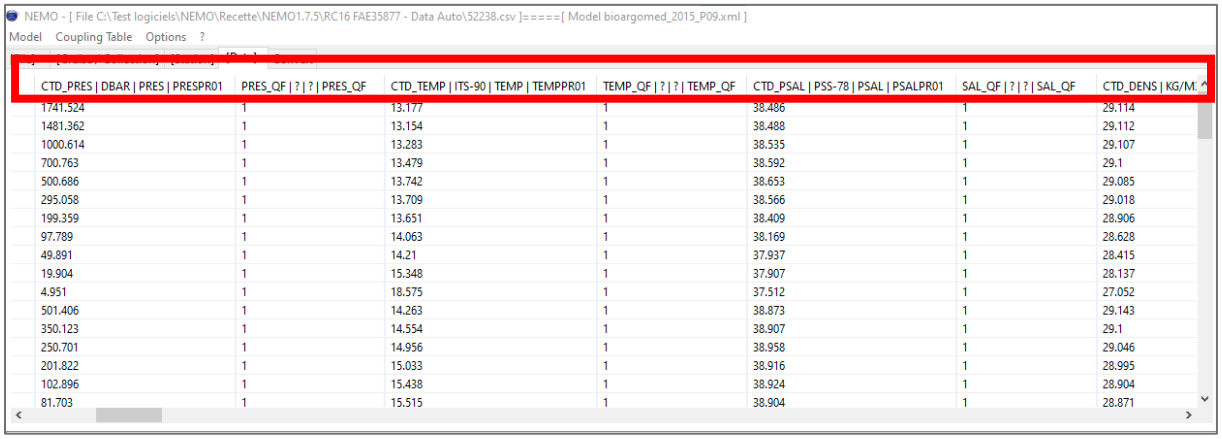
		PRES		TEMP		PSAL
7.4631	1	1741.524	1	13.177	1	38.486
7.4631	2	1481.362	1	13.154	1	38.488
7.4631	3	1000.614	1	13.283	1	38.535
7.4631	4	700.763	1	13.479	1	38.592
7.4631	5	500.686	1	13.742	1	38.653
7.4631	6	295.058	1	13.709	1	38.566
7.4631	7	199.359	1	13.651	1	38.409
7.4631	8	97.789	1	14.063	1	38.169
7.4631	9	49.891	1	14.21	1	37.937
7.4631	10	19.904	1	15.348	1	37.907
7.4631	11	4.951	1	18.575	1	37.512
18.5019	1	501.406	1	14.263	1	38.873
18.5019	2	350.123	1	14.554	1	38.907

Note that you can select several lines that will be displayed in the data screen column title like below:

- Selection of the lines in the file Tab:

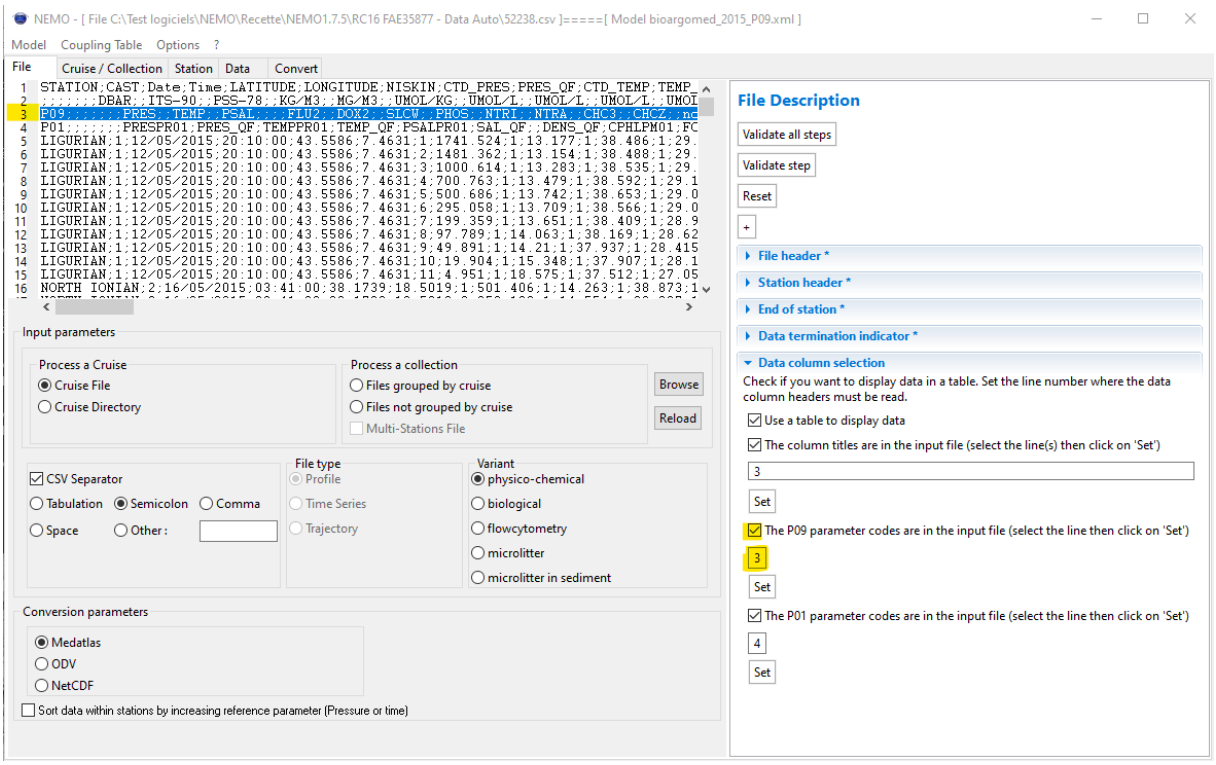


- This results in the following display in the data tab: the values of the 4 lines are displayed with a '|' separator in the column titles as shown below:

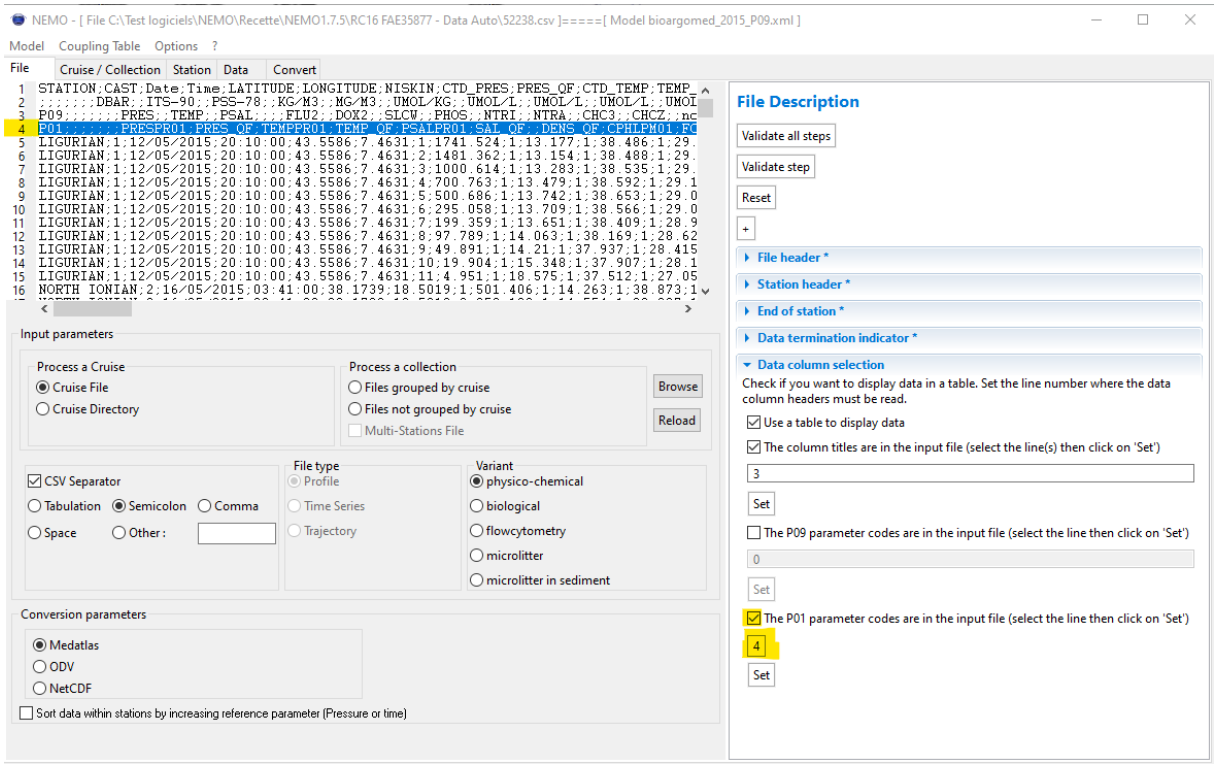


If the file(s) contains the parameter codes (P01 and/or P09) as column titles, check "The P09 parameter codes are in the input file" and/or "The P01 parameter codes are in the input file", select the line containing the P01 and/or P09 parameter codes, and click on "Set": **This will allow an automatic filling of the parameter lines in the Data tab** (see § 7.4.2.5) :

- Example of the selection of line with P09 codes for autofill of the data tab with P09 codes



- Example of the selection of the line with P01 codes for autofill of the data tab with P01 codes



7.2. Cruise description

This step is performed only in case of

- processing **one** cruise: that means that in the “File” tab, “Cruise file” or “Cruise directory” has been selected

and/or

- converting to MEDATLAS or netCDF format

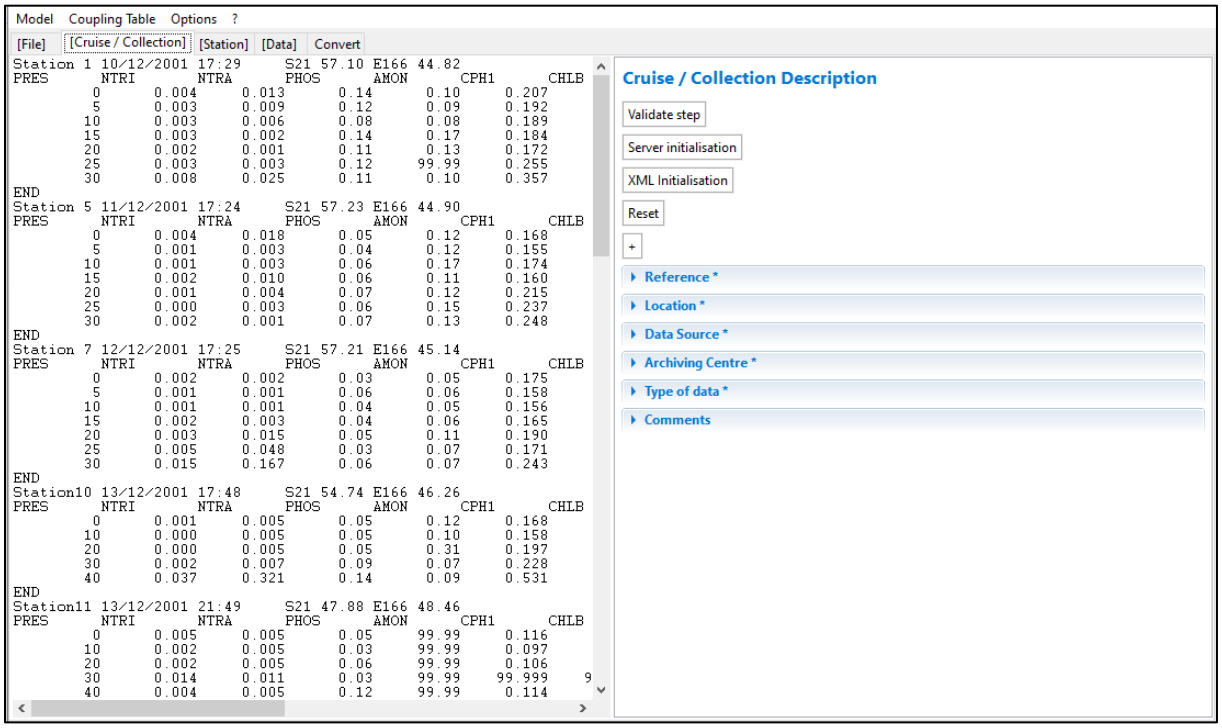


Figure 17 - Cruise description screen of NEMO

7.2.1. Ways of fulfilling the information

There are 3 ways of fulfilling the cruise information in NEMO:

- Server initialisation

  This is specific for IFREMER/SISMER use; it uploads the cruise information from the SISMER database using the NAUTILUS Web service.

- XML initialisation

  This is to import the information from the SeaDataNet CSR XML file (generated by MIKADO or other tools). The actual version of NEMO is compatible with the version ISO-19115 and ISO-19139 of the CSR XML schema.

- Manual input

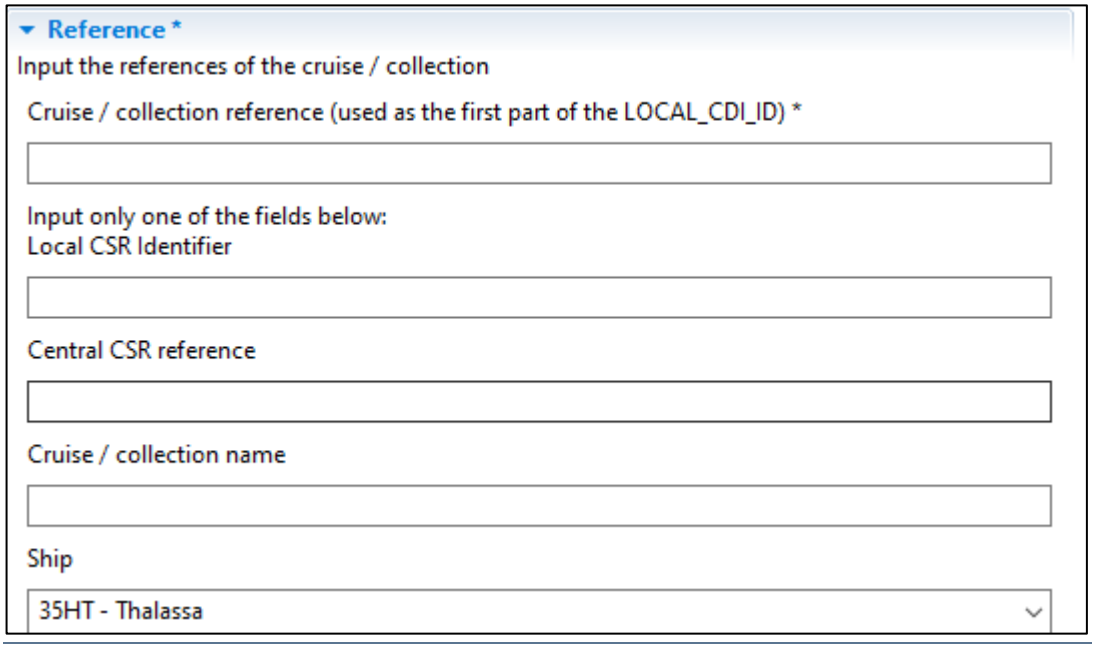
  If no automatic import of CSR information is available, the NEMO user can manually input the information.

7.2.2. Cruise information

Several sections must be filled; they are described in this chapter.

7.2.2.1. Reference

This section describes the reference of the cruise; It concerns all formats:



Cruise reference: MANDATORY

in the example given, it is a MEDATLAS reference which is composed as described in the MEDATLAS format description [2].

Note: the cruise reference is used in the LOCAL_CDI_ID which is composed as **[Cruise Reference]**_[Station Code]_[Data type] (station code is optional).

Local CSR Identifier: OPTIONAL

If set, this identifier will be used to create the SDN reference in the output file.

Example:

< https://csr.seadatanet.org/report/edmo/486/18000510/xml " xlink:role="isObservedBy" xlink:type="SDN:L23::CSR"/>

Nemo checks that the local CSR reference exists in the catalogue for the EDMO code set in the Nemo settings “EDMO ID of the organisation creating the CSR metadata” field. If not, Nemo displays a WARNING.

Central CSR Reference: OPTIONAL

If set, this identifier will be used to create the SDN reference in the output file.

Example:

<sdn_reference xlink:href="https://csr.seadatanet.org/report/ 20057238/xml" xlink:role="isObservedBy" xlink:type="SDN:L23::CSR"/>

Nemo checks that the central CSR reference exists in the catalogue. If not, Nemo displays an ERROR.

Note: it is not possible to input both local and central references.

Cruise name: MANDATORY

Ship: MANDATORY (if unknown set to ZZ99)

The list of ships is the C17 ship list of SeaDataNet common vocabularies.

If set, the ship code is automatically used to create an SDN reference in the output file.

Example:

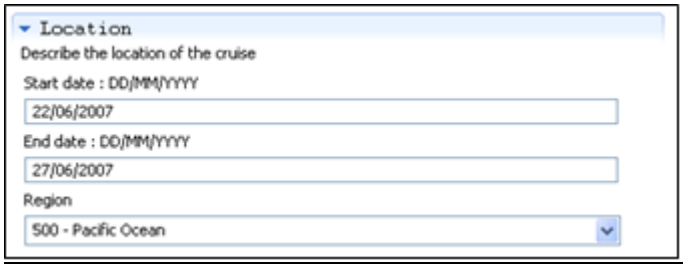
<sdn_reference xlink:href="https://www.seadatanet.org/urnurl/SDN:C17::35AY" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"/>

Note: since NEMO 1.6.0, the Cruise tab is available for ODV. The reference is not asked at the end of the process. The Cruise column value in the ODV file is the Cruise/collection name field.

In NEMO 2.0, enriched metadata are provided for the CDI-Summary file for MIKADO, consequently, the cruise information is very useful even if not used in the ODV format, but only for the metadata of the CDI record.

7.2.2.2. Location

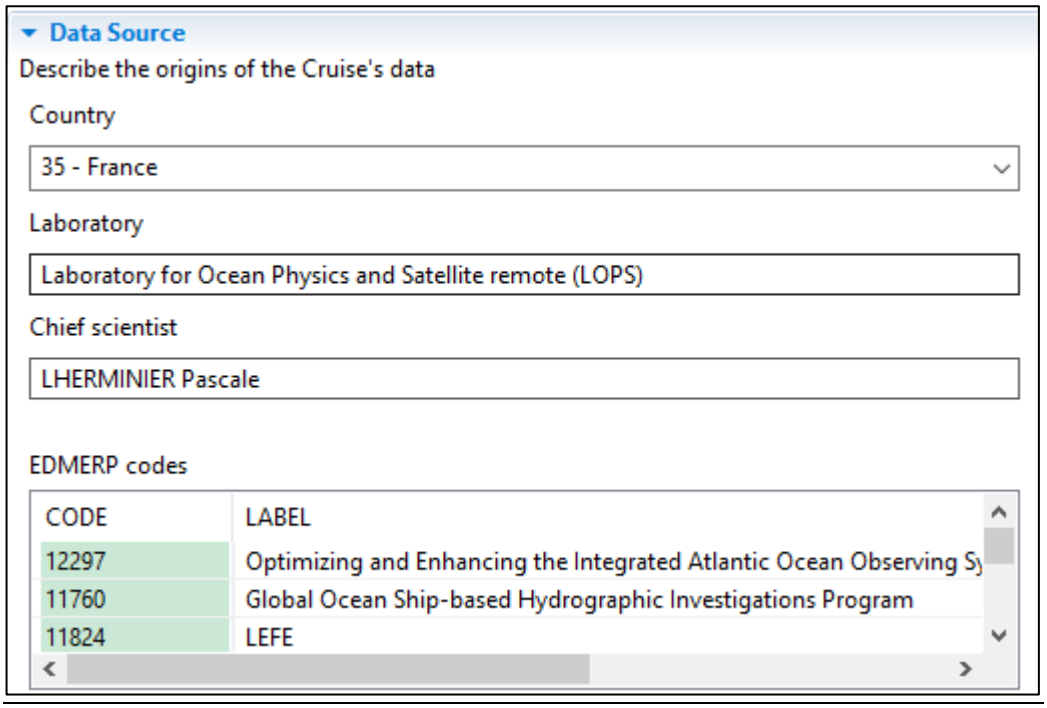
This section describes the temporal and geographical location of the cruise. It concerns MEDATLAS (mandatory) and netCDF (optional). The 3 fields are mandatory in MEDATLAS:



Region: the list of regions is the C19 sea areas list of SeaDataNet common vocabularies.

7.2.2.3. Data source

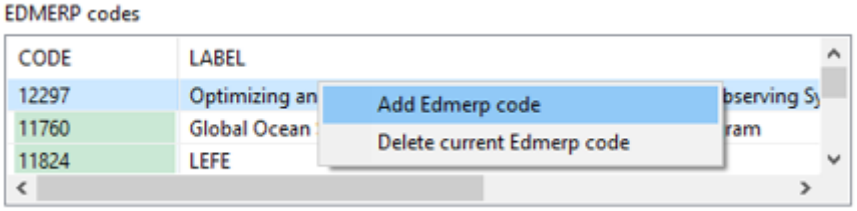
This section describes the source country, laboratory, project, and chief scientist of the cruise. It concerns MEDATLAS (mandatory) and ODV, netCDF (optional). The country and the chief scientist are mandatory in MEDATLAS.



Country: the list of countries is the C18 IOC country codes list of SeaDataNet common vocabularies.

Laboratory, Chief scientist, and Project are free text fields.

EDMERP Codes: The list of research projects linked to the data set. A right-click in the EDMERP table open the contextual menu allowing one to add or delete projects from the list:



These EDMERP codes are used in the output files as lines of “sdn_reference” linked to the EDMERP catalogue (see example below):

<sdn_reference xlink:href="https://edmerp.seadatanet.org/report/12297" xlink:role="isObservedBy" xlink:type="SDN:L23::EDMERP"/>

<sdn_reference xlink:href="https://edmerp.seadatanet.org/report/11760" xlink:role="isObservedBy" xlink:type="SDN:L23::EDMERP"/>

<sdn_reference xlink:href="https://edmerp.seadatanet.org/report/11824" xlink:role="isObservedBy" xlink:type="SDN:L23::EDMERP"/>

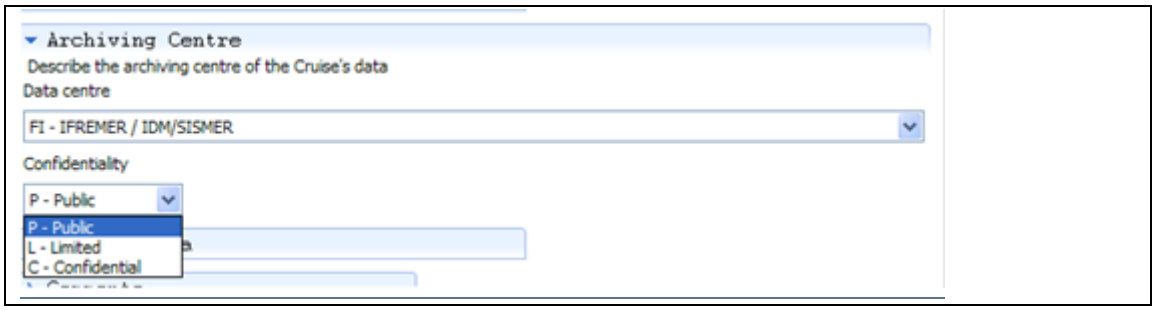
Note: for the MEDATLAS format, the project field, of the cruise header, will contain the list of the EDMERP codes separated with comas, as it is limited to 28 characters maximum, it will contain only the first 4 projects of the list.

Example of cruise header with a list of projects, in MEADATLAS format:

```
*FI35201805100 OVIDE                                35HT Thalassa                CRLF
11/06/2018-15/07/2018 North Atlantic Ocean                                      CRLF
35 Laboratory for Ocean Physics and Satellite remote (LOPS)                     CRLF
LHERMINIER Pascale                          Project=12297;11760;11824;12222     CRLF
Regional Archiving= FI                      Availability=LCRLF
Data Type=D71 n=30   QC=NCRLF
Data Type=H09 n=2220 QC=NCRLF
Data Type=H10 n=104  QC=NCRLF
```

7.2.2.4. Archiving centre

This section describes the data centre where data are archived and the MEDATLAS code for the data availability. It concerns MEDATLAS (mandatory) and netCDF (optional).

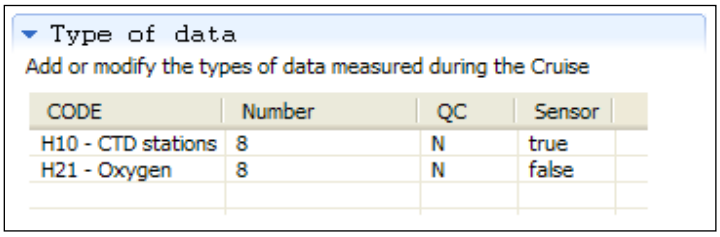


Data centre: the list of data centres is the L30 MEDATLAS data centres of SeaDataNet common vocabularies. By default, the data centre is the one given in NEMO settings (cf. paragraph 6.2).

Confidentiality: it corresponds to the MEDATLAS code for data availability that can take one of the following values: P – Public, L – Limited, and C – Confidential.

7.2.2.5. Type of data

This section deals with the ROSCOP code of data found in the files that are going to be converted and concerns only the MEDATLAS format.

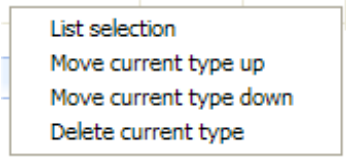


The data type code is the ROSCOP code; it is the C77 ICES ROSCOP data types list of SeaDataNet common vocabularies.

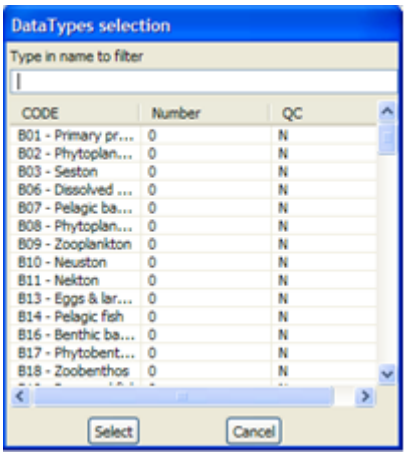
At least one data type with Sensor at true is mandatory.

"Number" represents the number of stations with the corresponding data type in the file; it cannot be equal to 0. In this example, the cruise file contains 8 CTD stations; each of them has dissolved oxygen measurements.

A right-click on the list opens the following window:



To add a code to the list, click on “List selection” and you will get a window to choose a new data type:



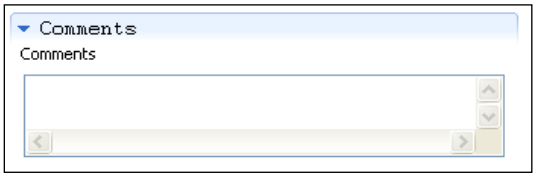
When the data type is selected in the list, click on “Select” to add it to the list of data types of the cruise, and then change the number of stations which is set to 0, by default.

To delete one or several data types: select the line(s) to be deleted by left click on the data type lines (use Shift and/or Control to select several lines), then right-click on the list and select “Delete current type” in the menu.

It is also possible to move up or down a current data type in the list.

7.2.2.6. Comments

This section is used to input comments about the cruise or the data measurements. There is no limitation on the number of comment lines.



When the cruise description is over, click on the “Validate step” (cf. paragraph 5.4) to move to the next step.

7.3. Station description

This step is performed to indicate to NEMO where to find the mandatory or important information in the station header(s) of the file(s). This information is changing following the File type (vertical profiles, time series, or trajectories) and the variant (physico-chemical, biological, microlitter, or flow cytometry data)

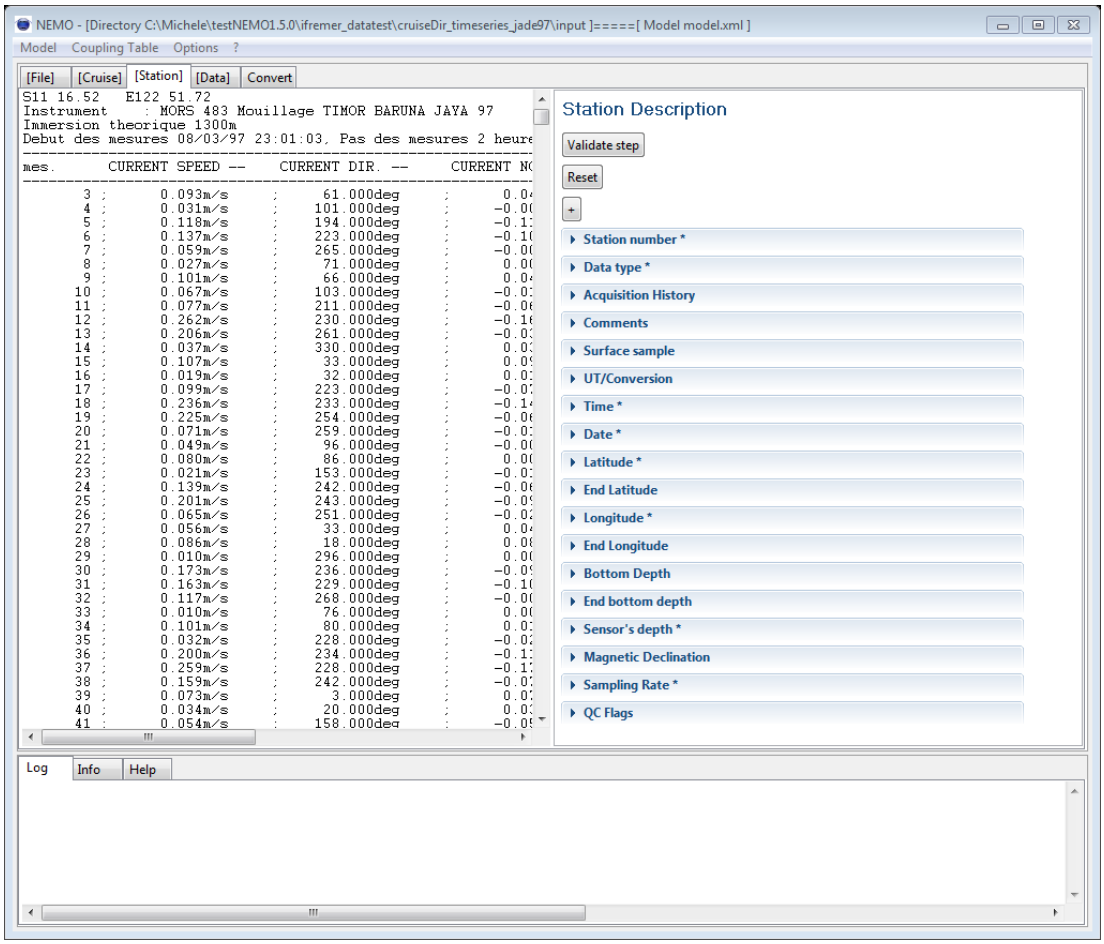


Figure 18 - Station description window with all possible fields

Mandatory fields are Station code, Data type, Time, Date, Latitude, and Longitude for all data types and variants.

Sensor Depth and Sampling rate are mandatory for time series

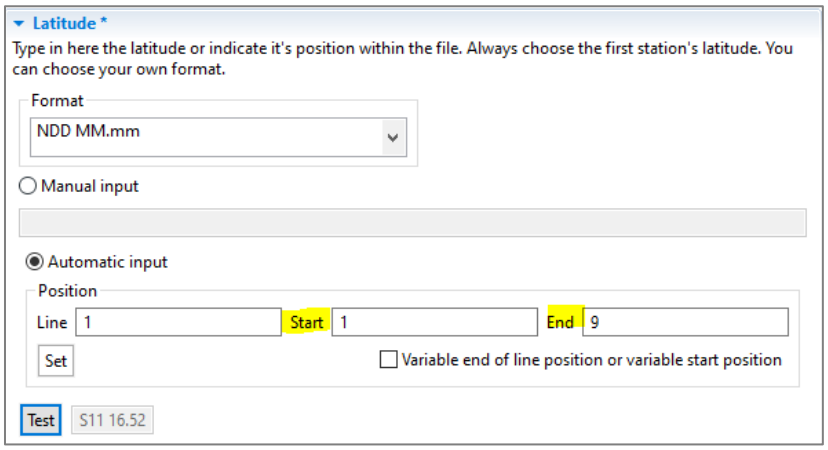
Fields Acquisition History, Comments, Surface Sample, UT/Conversion, End Latitude, End Longitude, End Depth, and Sampling Rate are not mandatory and can't be described on a data line.

End Latitude, End Longitude, and End Depth (if existing) are the last data line value of Latitude, Longitude, and Depth. This information can be described in the station tab or can be automatically filled by NEMO if read in the data lines.

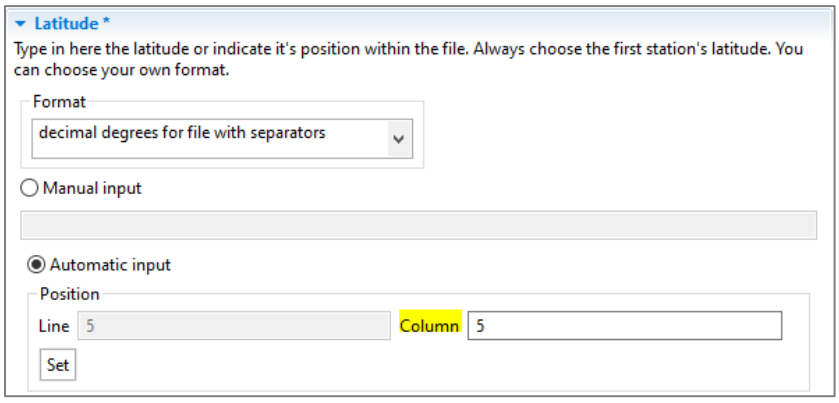
For trajectories, the fields Latitude, Longitude, and Depth (if existing) must be described on a data line

When the station description is set, click on "Validate step" (cf. paragraph 5.4) to move to the next step.

Note that : The mandatory information of a station can be located in a part of the input file without separators, in that case the location of the information in the input file will be set as a **start and end characters** like below:



On the contrary, when this information is located in a CSV station header, then the location of the information in the input file will be set as a **column number**, like here below:



7.3.1. Considerations on LOCAL_CDI_ID

The LOCAL_CDI_ID is built by Nemo. It is composed as [Cruise Reference]_[Station Code]_[Data type].

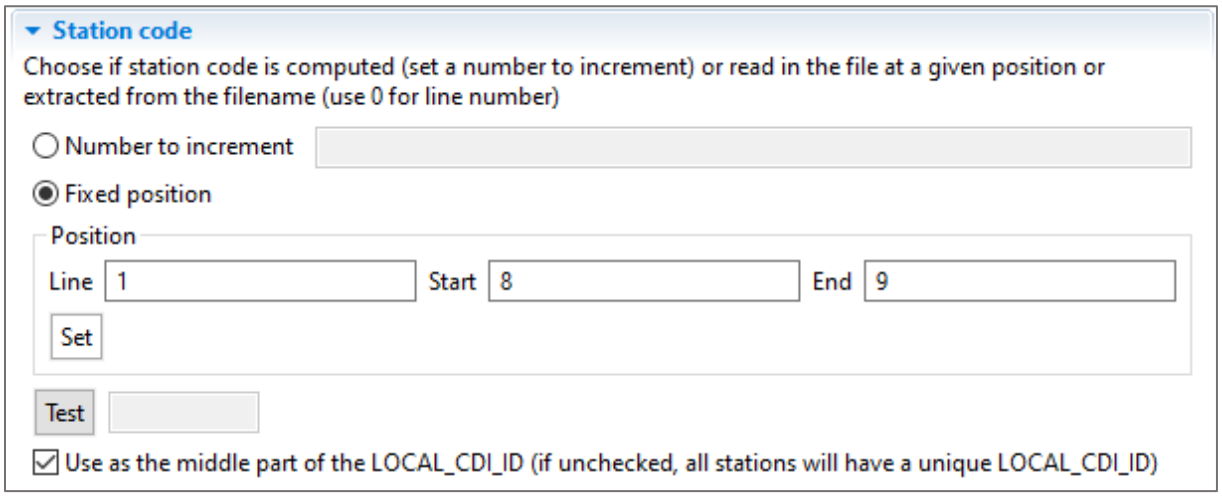
The station code is optional.

Cruise reference is set in the Cruise tab and is described in §7.2.2.1.

Station code and Data type are set in the Station tab and are described respectively in §7.3.2 and §7.3.3.

7.3.2. Station code

The station code can be an incremental number starting at a number given by the user (default starting number is 1) or can be in the station header and input in NEMO using the set and test buttons (paragraphs 5.2, 5.3), or can be fixed for several stations (in the case of biological, microlitter and flow cytometry variants)



Remark: If the station code is located within the filename, use 0 as the line number, and give the start and end characters in the file name.

The station number field is used in two ways:

- As station number, which is the second column in ODV files, the SDN_STATION variable in SeaDataNet NetCDF
- As part of the MEDATLAS reference in the MEDATLAS format
- As part of the LOCAL_CDI_ID

In ODV, a trajectory is considered as a series of stations with one point of measurement at each station, **but the LOCAL_CDI_ID is the same for all the stations**. In MEDATLAS and netCDF a trajectory is only one station within which latitude and longitude are considered as measured parameters. The station number cannot be incremental.

If you need to set a unique LOCAL_CDI_ID, you can choose not to use the station number as the middle part: uncheck the "Use as the middle part of the LOCAL_CDI_ID" check box.

This can be useful for example for trajectories, ADCP data presented as successions of vertical profiles, or for some biological (such as the BioODV_Demfish_monoCDI example in the "*TemplateAndExamples_BioODV.xls* file) and microlitter variants which are "sort of" trajectories and have only one LOCAL_CDI_ID for all "stations.

7.3.3. Data type

It is the ROSCOP code of the instrument (H10 - CTD for example) used for data collection; it is selected in the list of data types input during the previous step (cruise description) or can be input manually by the user only in ODV and netCDF for data types that do not exist in the list.

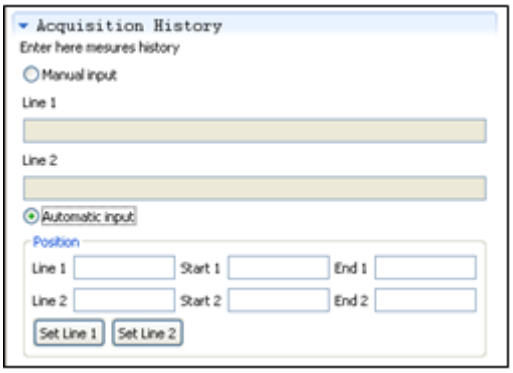
If processing a collection of files, the "Data type" field is not available, it will be asked during the conversion step.

Note: the data type is used in the LOCAL_CDI_ID which is composed as: [Cruise Reference]_[Station Code]_**[Data type]** (Station Code is optional)

7.3.4. Acquisition history

They are 2 lines for comments about the method and/or instrument used for data collection. They can be manually or automatically input, in the following fields.

Not available in netCDF.

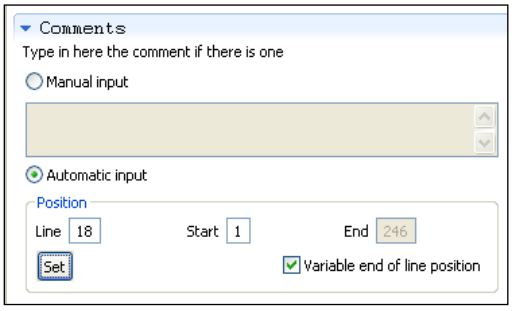


7.3.5. Comments

Comments about the station can be manually or automatically inputted. There is no limitation on the number of comment lines.

If the comment is spread among several lines which do not have the same length, click on “Variable end of line position”.

Not available in netCDF.



7.3.6. Surface samples

Same principle as Acquisition history, 2 lines for comments about surface samples if there are some.

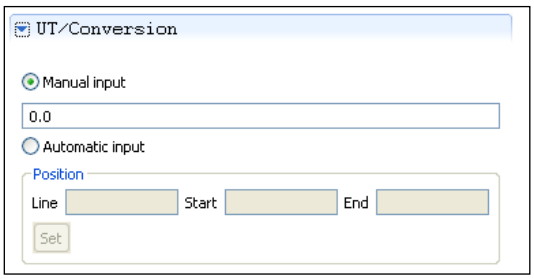
Not available in netCDF.

7.3.7. UT/Conversion

This field is to manage non-universal time in the input files.

If the station time in the input file is TU-5, type ‘5’ (or read by automatic input) in the UT/Conversion field and NEMO will add 5 hours to the input time. If the time in the input file is TU+5, type ‘-5’ in the field.

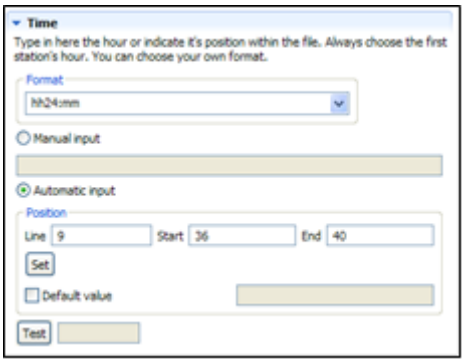
The default value is zero, for this field.



7.3.8. Time

This field concerns the time of stations.

The user needs to input the format in which time is provided in the input file and then, he has to set and test the value (paragraphs 5.2, 5.3).



To describe the format, the user must either select a predefined value in the list, or he can create its format within the following:

hh: hour expressed in 2 digits (hh24 indicates time on 24 hours)

mm: minutes expressed in 2 digits

ccc: hundredth in the time expressed in 1 up to 7 digits

ss: seconds expressed in 2 digits

ttttt: seconds expressed in 1 up to 5 digits

PM: allows NEMO to read PM and AM time

If date and time are inseparable, you can select the value and use the same date-time pattern for both fields. For example: for CSV files with date and time in the same column, ISO datetime formats or datetime in Julian days.

Examples of valid formats for time:

22:30:15 ➔ hh24:mm:ss

10-12 AM ➔hh-mm PM

17.125 ➔ hh24.ccc (converted to 17:07:30.000)

2008/02/05 15:32 ➔YYYY/MM/DD hh24:mm (result is 15:32)

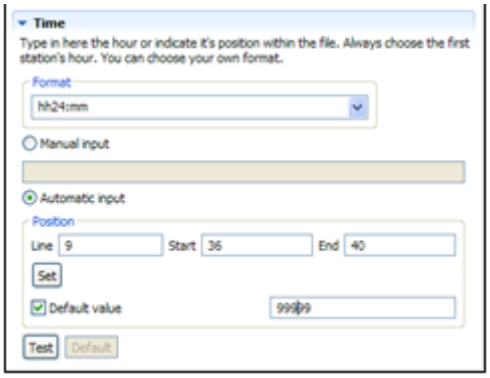
2008-08-12T03:16:00 ➔ ISO8601

2008-08-12T03:16:00.002 ➔ ISO8601

2008-08-12T03:16 ➔ ISO8601

2446101.156 ➔ JULIAN DAY

Time may be unknown for some stations of vertical profiles and in that case, a default value must be specified, user has to click on Default value and input this value in the corresponding field like in the example below

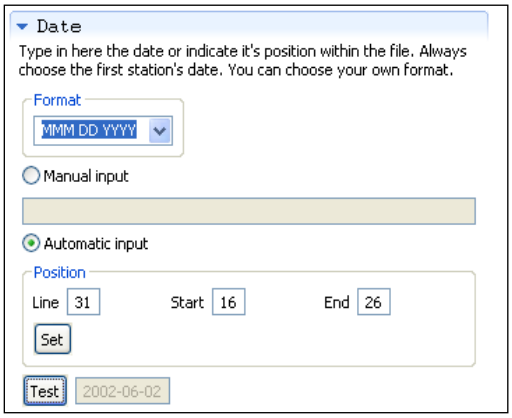


Remark: In the test field, time is displayed in ISO format, if UT/conversion field contains a value different from 0, the displayed time takes into account the time conversion to UT.

7.3.9. Date

This field concerns the date of stations.

The user needs to input the format in which the date is provided in the input file and then, he has to set and test the value (paragraphs 5.2, 5.3).



To describe the format, a user must either select a predefined value in the list, or he can create his format within the following:

YY or YYYY: year expressed in 2 or 4 digits

MM: month expressed in 2 digits

MMM: month expressed in 3 alphabetic characters

DD: day in the month expressed in 2 digits

Note that the format for the date is case-sensitive; mm means minutes and not month (MM).

For CSV files with date and time in the same column, declare the datetime pattern in both date and time fields.

Examples of valid formats for date:

2008/07/10 ➔ YYYY/MM/DD

86-07-10 ➔ YY-MM-DD

Jun 10 2002 ➔ MMM DD YYYY

2008/02/05 15:32 ➔YYYY/MM/DD hh24:mm (result is 2008-02-05)

2008-08-12T03:16:00 ➔ ISO8601

2008-08-12T03:16:00.002 ➔ ISO8601

2008-08-12T03:16 ➔ ISO8601

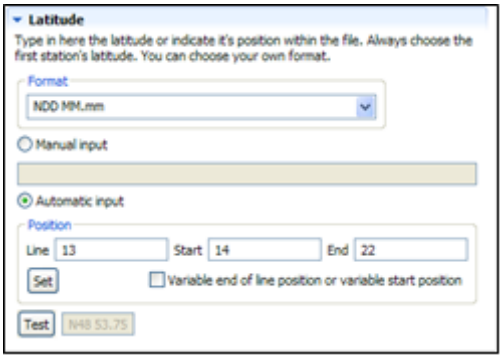
2446101.156 ➔ JULIAN DAY

In the test field, the date is displayed in ISO format

7.3.10. Latitude and Longitude

These fields concern the latitude and longitude of stations.

The user needs to input the format in which latitude and longitude are provided in the input file and then, he has to set and test the values (paragraphs 5.2, 5.3).



To describe the format, the user must either select a predefined value in the list:

- predefined format
- Decimal degrees for a file with separators: available only for files with a separator, in which latitude and longitude are given in the CSV columns. Decimal degrees, regardless of the number of characters.

Or the user can describe his format within the following:

N: expresses the hemisphere. Input values have to equal N or S in the case of latitudes and W or E in the case of longitudes

+: expresses the hemisphere. Input values have to equal ‘ ’ or ‘+’ to express N in the case of latitudes, E in the case of longitudes, and ‘-’ to express S in the case of latitudes, W in the case of longitudes

DDD or DD or D: Degrees

DDD.ddd or DD.ddd: Degrees in decimal values. The maximum number of D must be 3 in the case of longitudes and 2 in the case of latitudes

DDD.ddd or DD.ddd: Degrees in decimal values. The maximum number of D must be 3 in the case of longitudes and 2 in the case of latitudes. The number of ‘d’ characters expresses the number of decimals.

MM: Minutes

MM.mm: Minutes in decimal values. The number of ‘m’ characters expresses the number of decimals.

SS: Seconds

Decimal degrees for a file with separators

Examples of valid formats for latitude and longitude:

W123 10.25 ➔ NDDD MM.mm

7.12345 ➔ +D.ddddd or Decimal degrees for a file with separators

-123. 175 ➔ +DDD.ddd or Decimal degrees for a file with separators

S45 10’ 55’’ ➔ NDD MM SS

49° 40.685' N➔DD° MM.mmm' N"

In the test field, latitude and longitude are displayed in MEDATLAS format.

Click on “variable end of line position or variable start position” if all latitudes and longitudes do not end or start at the same character in every station (this often happens with not significant zero values) and if the file is not with separators

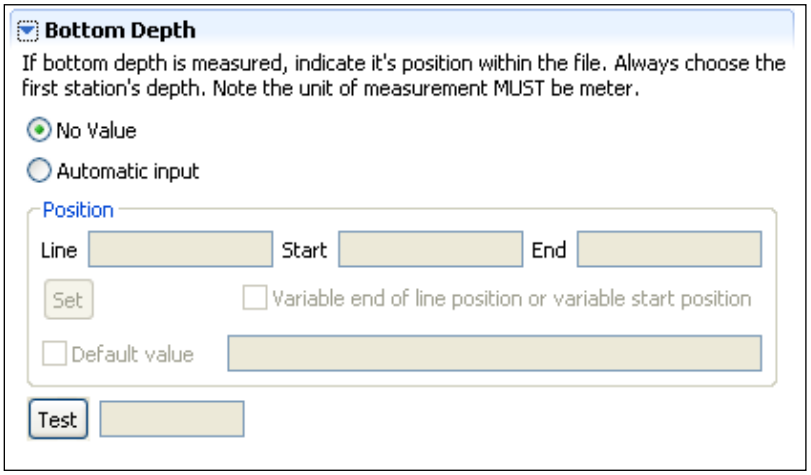
For example:

Latitude: +25.205
Latitude: +25
Latitude: +25.15
Latitude: -0.15 (‘-‘ 1 character to the right of ‘+’)

These 4 lines (in 4 different stations of the same dataset) will be described as +DD.ddd with “variable end of line position or variable start position”.

7.3.11. Bottom depth

This field concerns the bottom depth of stations, which must be given in metres in the input file. This field can be input automatically or set to “no value”.



If the file is not a CSV file, click on “variable end of line position or variable start position” if all bottom depths do not end or start at the same character in every station (this often happens with not significant zero values)

Some files could contain default values if the bottom depth is not measured (-999, for example). To describe this value, click ‘Default value’ and enter the corresponding value in the text field.

7.3.12. End Latitude and End Longitude

These fields concern the latitude and longitude of the end time of the time series.

By default, if not input, the values will be the same as “Latitude” and “Longitude” which are considered as the position at the start time of the time series.

Input in these fields is the same as for “Latitude” and “Longitude” described for vertical profiles.

Not available in netCDF.

7.3.13. End Bottom depth

This field concerns the bottom depth at the end time of the time series.

By default, if not input, the value will be the same as Depth which is considered as the bottom depth at the start time of the time series.

Input in this field is the same as for “Depth” described for vertical profiles.

Not available in netCDF.

7.3.14. Sensor’s depth

This field concerns the depth of the sensor measuring time series. It must be given in metres in the input file. This field can be input manually or automatically.

7.3.15. Magnetic Declination

This field concerns the magnetic declination at the location of the time series, useful for current meters. The declination is a signed integer: W007 declination must be input as -7 and E005 as +5 or 5. This field can be input manually or automatically.

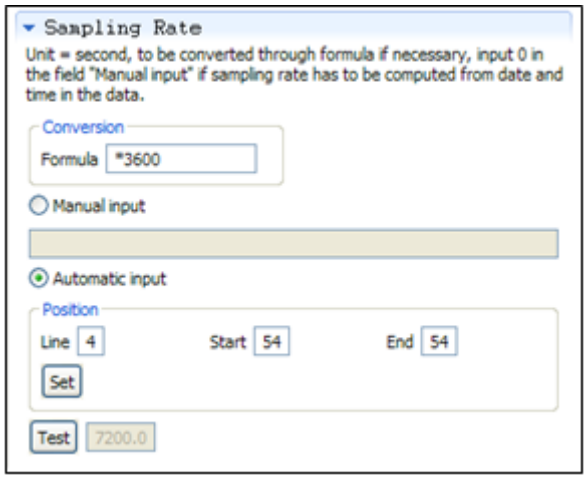
Not available in netCDF.

7.3.16. Sampling Rate

This field concerns the sampling rate of the sensors. This sampling rate can be input manually, or automatically.

NEMO will calculate it automatically if time and date are selected in the first line of measurements.

The unit of the sampling rate is Second. If it is not given in seconds in the input file, it must be converted by using the field “Conversion formula” (for example: if the sampling rate is given in Hours in the input file, input *3600 in the formula).



For time series If time or date is selected in the first line of measurements in the file displayed in the NEMO window, the sampling Rate field is disabled, and NEMO will calculate it.

7.3.17. QC Flags

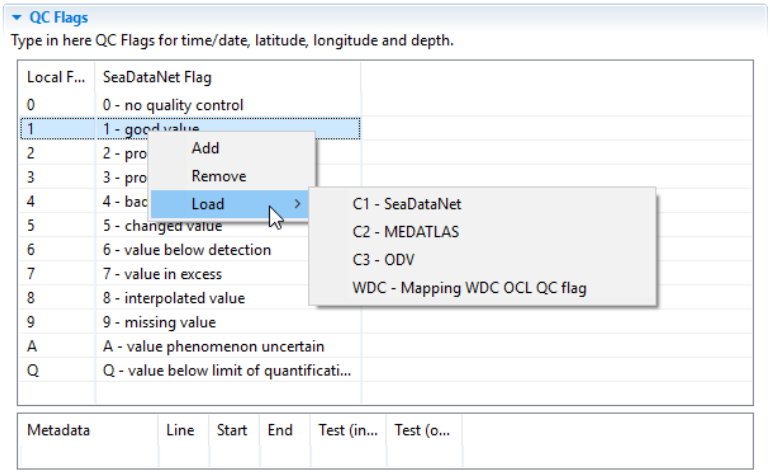
This part concerns the quality flags that could exist in the input file.

QC Flags can concern metadata and/or data.

- Header QC (metadata) flags are only used in MEDATLAS format, they concern Date/Time, Latitude, Longitude, and Bottom depth.
- Data QC flags can be used in all formats.

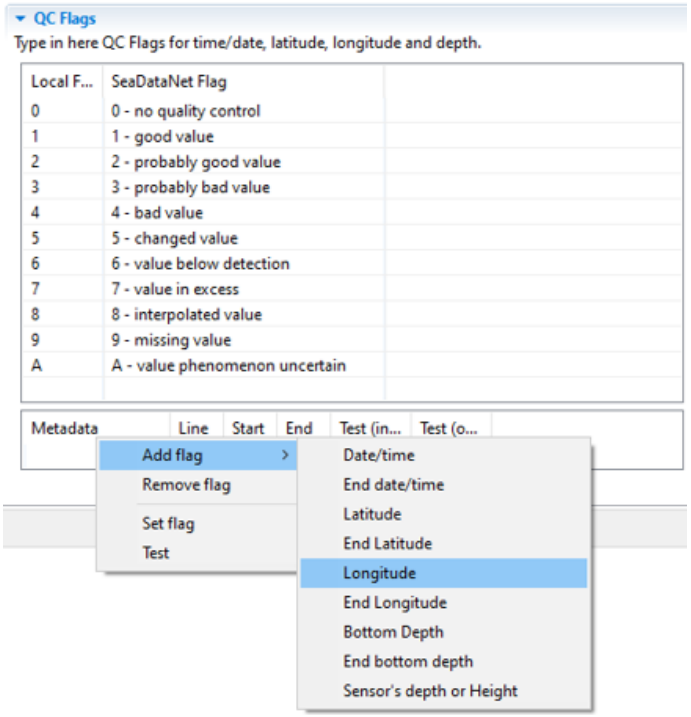
If some quality flags exist in the input file, it is necessary to have their mapping with the SeaDataNet flag scale. To do so, it is possible to add and remove values in the mapping list or to load an existing mapping (paragraph 6.11). To open the menu, right-click on the mapping table.

Remark: if the input file has the same quality flag scale as SeaDataNet, no mapping is necessary.



When mapping is done, the location of the metadata quality flags can be input.

Right-click on the table to open the menu:



Then you can add or remove a line. In the example, above, the user is adding a line for the longitude flag.

Once one line is added, the flag has to be selected in the file (left part of NEMO window) and set in the table by clicking on Set start/end in the menu. The value can be tested by clicking on “Test” in the menu.

When the station description is over, click on the “Validate step” (cf. paragraph 5.4) to move to the next step.

7.4. Data description

This step is performed to indicate to NEMO where to find the data measurements in the input file(s). This information concern the name and unit of the measured parameters, their default values (found in the input file when the parameter is not measured), and the format in which the parameter will be written in the output file.

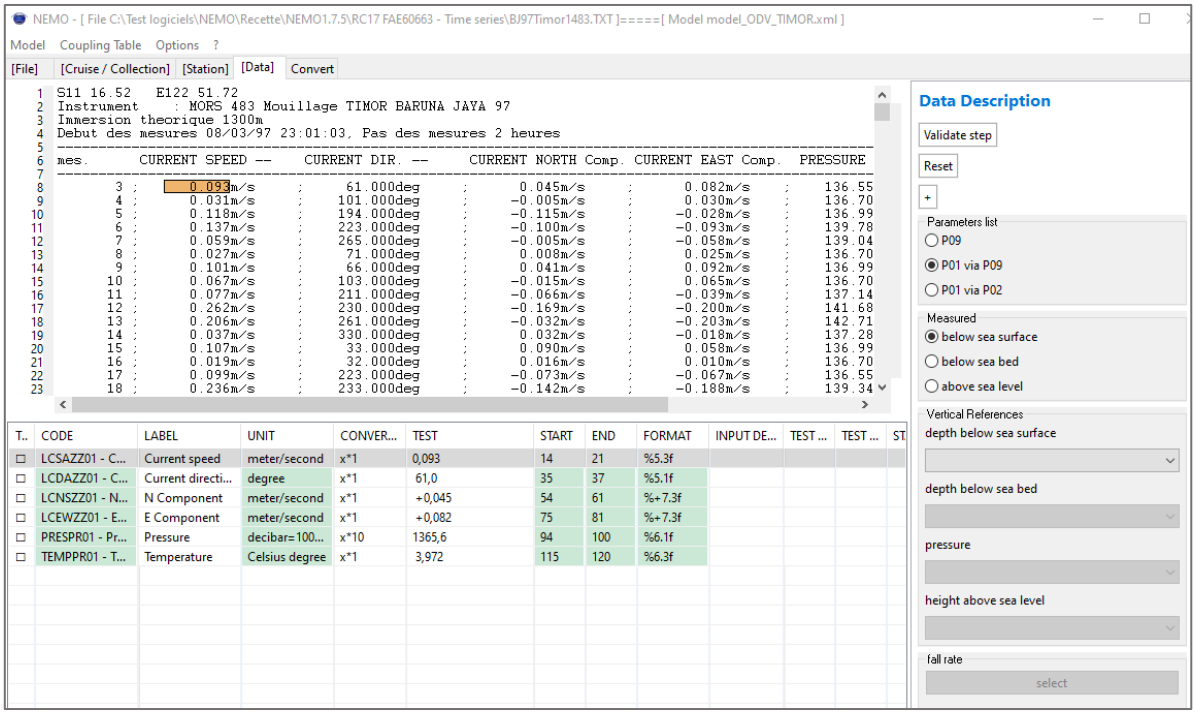


Figure 19- Data description window, text file without separators

If the file(s) contains separators and if the data columns selection section was chosen in the File tab, data are displayed in a table:

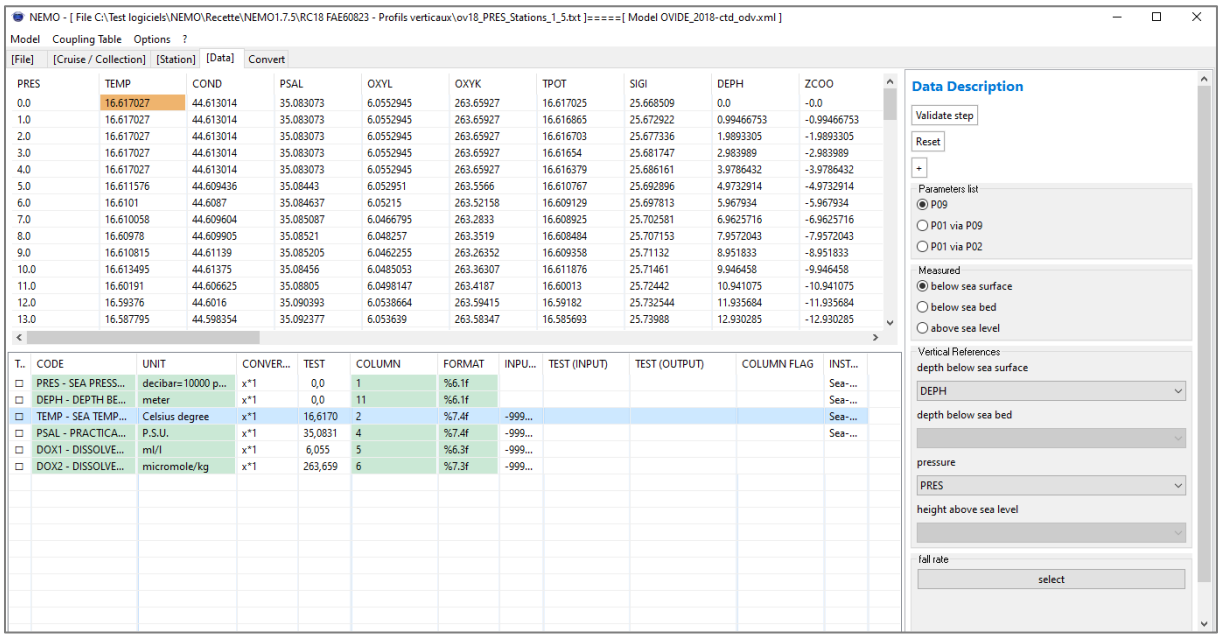


Figure 20- Data description window: data displayed in a table

First choose the parameters list to use: P09, P01viaP09, or P01viaP02 (P01viaP02 is disabled for MEDATLAS conversion and P09 is disabled for netCDF conversion).

Then choose the measure type: “below sea surface”, “below sea bed”, or “above sea level”.

If input files concern biological, flow cytometry, or microlitter variants, the mandatory parameters are automatically added. Some of the mandatory parameters allow several P01 (eg. SamplingEffort in biological variant can be either AREABEDS, VOLWBSMP, LENTRACK, AZDRZZ01, or VOLFFMXX). By default, “samplingEffort” is set to VOLWBSMP, the user can remove this parameter and choose another one. Nemo will check if the mandatory parameters are present during the tab validation.

See the variants documentation: [4], [5], [6], [7], [8], [9].

If input files concern physico-chemical vertical profiles, one of the following parameters is mandatory:

	P09 or P01viaP09	P01viaP02
below sea surface	PRES or DEPH	a P01 parameter chosen from the AHGT P02 list
below sea bed	DPSF	a P01 parameter chosen from the AHGT P02 list
above sea level	ALTS	a P01 parameter chosen from the AHGT P02 list

Then provide the vertical reference: this step is needed to control the user input: the existence of mandatory parameters, and their position in the list, it also identifies the parameters that will be used by NEMO for automatic additions of calculated parameters:

The parameters listed in these fields are filled from the parameters added in the table.

You have to add the appropriate parameters (see table above) in the table to be able to select a value in these fields.

If P09 or P01viaP09 is used, the vertical reference fields will be automatically selected when the ‘validate step’ button is clicked.

If P01viaP02 is used, you will have to select manually the vertical reference.

If input files concern physico-chemical or flow cytometry **time series**, the date and time of measurements will be automatically added to output files, they do not need to be described in the measurement description.

If input files concern physico-chemical or flow cytometry **trajectories** date, time, latitude, longitude, and bottom depth (if existing) of measurements will be automatically put in output files, they do not need to be described in the measurement description.

If input files concern bathythermograph profiles, you can choose a fall rate via the L33 BODC list.

This code will be associated with the vertical reference parameter selected in the "Vertical references" section and will be written in the SDN Mapping in MEDATLAS and ODV, or the variable attributes in netCDF.

Example in ODV:

//<subject>SDN:LOCAL:PRESPR01</subject><object>SDN:P01::PRESPR01</object><units>SDN:P06::PASX</units><instrument>TOOL0804</instrument><fallrate>745</fallrate>

Since version 1.4.4, NEMO accepts **non-numeric parameters for ODV format only**. Click on the left-side checkbox to specify that the parameter is not numeric.

7.4.1. Menu of the table of measurements

Right-click on the table of measurements opens the following menu:

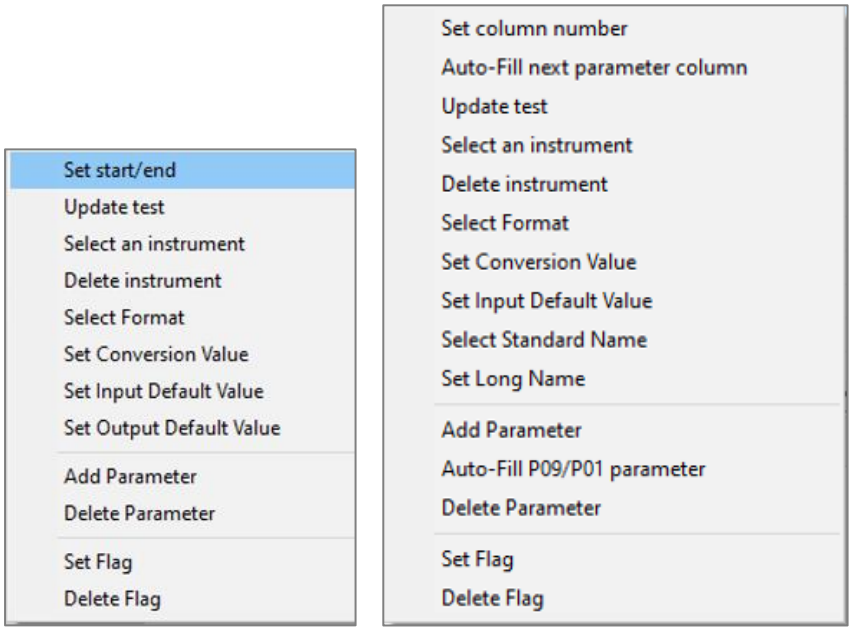


Figure 21 – Parameters menu for a text file without separators and a conversion to MedAtlas (left) and for a text file with separators for a conversion to netCDF (right)

The available items in the Parameters menu depend on the context:

- ***Select a P06 unit***, is only available if P01 via P02 Parameter list is chosen, and if the parameter is a numerical measurement
- ***Select a format*** is only available if P01 via P02 Parameter list is chosen
- ***Select a standard name*** is only available for conversion to the netCDF format

Auto-fill next parameter column and ***Auto-fill next parameter flags*** are only available for CSV files and if at least one column number already exists in the parameter table of the data tab. The role of each item on the menu is explained hereafter.

7.4.1.1. Set start/end or Set column number

Used to set the start and end character (ASCII file, not CSV) or the column number (csv files) of the selected parameter.

Example of a Text file without separators: start and end character of the parameter in the input file:

CODE	UNIT	CONVER...	TEST	START	END	FORMAT	INPU...	OUTPUT DEF. ...
HCSP - HORIZ...	meter/second	x*1	0,093	14	21	%5.3f		9.999
HCDT - DIREC...	degree true	x*1	61,0	35	37	%5.1f		999.9
NSCT - CURRE...	meter/second	x*1	+0,0...	56	61	%+7.3f		-99.999
EWCT - CURR...	meter/second	x*1	+0,0...	76	81	%+7.3f		-99.999
PRES - SEA PR...	decibar=100...	x*10	1365,6	94	100	%6.1f		-999.9
TEMP - SEA TE...	Celsius degree	x*1	3,972	115	120	%6.3f		99.999

Example of a CSV file with separators: Column number of the parameter in the input file:

CODE	UNIT	CONVER...	TEST	COLUMN	FORMAT	INPU...	OUTPUT DEF. ...
PRESPR01 - Pr...	decibar=100...	x*1	1741,5	8	%6.1f		-999.9
TEMPPR01 - T...	Celsius degree	x*1	13,177	10	%6.3f		99.999
PSALPR01 - Pr...	P.S.U.	x*1	38,486	12	%6.3f		99.999
CPHLPM01 - ...	milligram/m3	x*1	0,00...	16	%8.4f		999.9999
DOXMZZXX - ...	micromole/kg	x*1	195,6...	18	%7.3f		999.999

7.4.1.2. Auto-Fill next parameter column

For a CSV file, used to fill automatically the column number of all the parameters in the table, once the position of at least one parameter has been input.

7.4.1.3. Update test

Used to insert the value in the test fields including “Test” (for the measured parameters), “Test (input)” for the value of the quality flag read in the input file, and “Test (output)” for the value of the quality flag in the output file.

The user can then checks that the displayed values are correct and correspond to the values of the input files.

7.4.1.4. Select an instrument

Used to add an instrument via the L22 list. If several lines are selected in the table of parameters, the same instrument will be added for all selected parameters

7.4.1.5. Delete instrument

Used to delete the instrument of one or several parameters (if several line are selected).

7.4.1.6. Select a P06 unit

Used to add a unit via the P06 list when using P01 via P02 parameters. Visible only in this case. If several lines are selected in the table of parameters, the same unit will be added for all selected parameters.

7.4.1.7. Select format

Used to add a format via a predefined list. The format can be manually input; this menu helps to choose the format with examples. If several lines are selected in the table of parameters, the same format will be added for all selected parameters

Visible only in if using P01 via P02 parameters.

7.4.1.8. Set conversion value

Used to set a conversion value (in case of different units in the input file and the output file) of several parameters (if several line are selected).

7.4.1.9. Set input default value

Used to describe the default value used in the input file for a parameter. If several lines are selected in the table of parameters, the same “Input Default value” will be added for all selected parameters.

7.4.1.10. Select Standard Name

For netCDF only, used to select the standard name of one parameter. If several lines are selected in the table of parameters, the same “Standard Name” will be added for all selected parameters.

7.4.1.11. Set Long Name

For netCDF only, used to describe the long name of one parameter. If several lines are selected in the table of parameters, the same “Long Name” will be added for all selected parameters.

7.4.1.12. Add Parameter

Used to add a new parameter in the table of measured parameters. (see paragraph 7.4.2)

7.4.1.13. Delete Parameter

Used to delete one or several parameter lines (if several line are selected) from the parameter list.

7.4.1.14. Set Flag

Used to set the start and end characters or the column number of the quality flag of the selected parameter.

7.4.1.15. Auto-Fill next parameter flags

Used to fill automatically the column number of all the flags in the table, once the position at least one flag has been input.

7.4.1.16. Delete flag

Used to delete the quality flag information of the selected parameter(s).

7.4.2. How to add a parameter in the table

To add a parameter in the table, right-click on the data table and click on *Add a Parameter*.

It opens a parameters selection window listing P09 or P02 parameters, depending on which parameters list is applicable.

7.4.2.1. Using the P09 parameter list

To add a parameter in the table, right-click on the data table and click on *Add a parameter.*

It opens a parameters selection window listing P09 parameters.

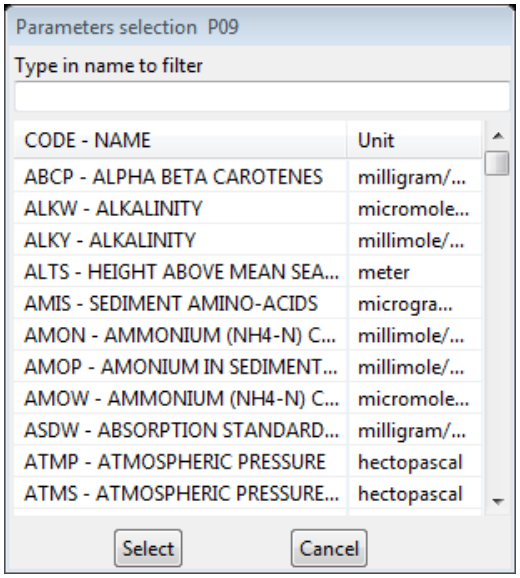
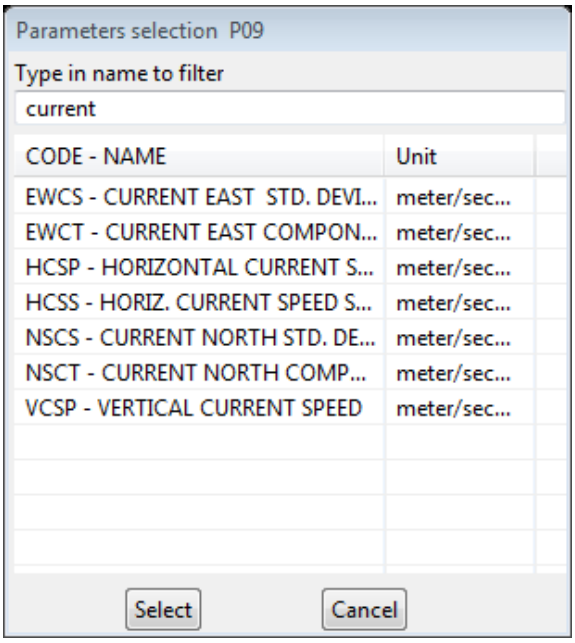


Figure 22- The parameters selection window displays the P09 list of SeaDataNet (MEDATLAS codes for parameters)

Select a parameter in this list (use filter to find a specific parameter: in the example below, there is a filter on “current”), then press “Select”.



The selected parameter is added to the table, with some values filled by default. The default and the format values linked to the parameter are downloaded from the parameters list of the NEMO Web service.

CODE	Unit	Conversion	Test	Start	End	Format	Input def. v...	Output def. ...	Tes
EWCT - CURREN...	meter/second	x*1		0	0	%+7.3f		-99.999	

Format, input default value (and output default value if MEDATLAS) can be manually modified.

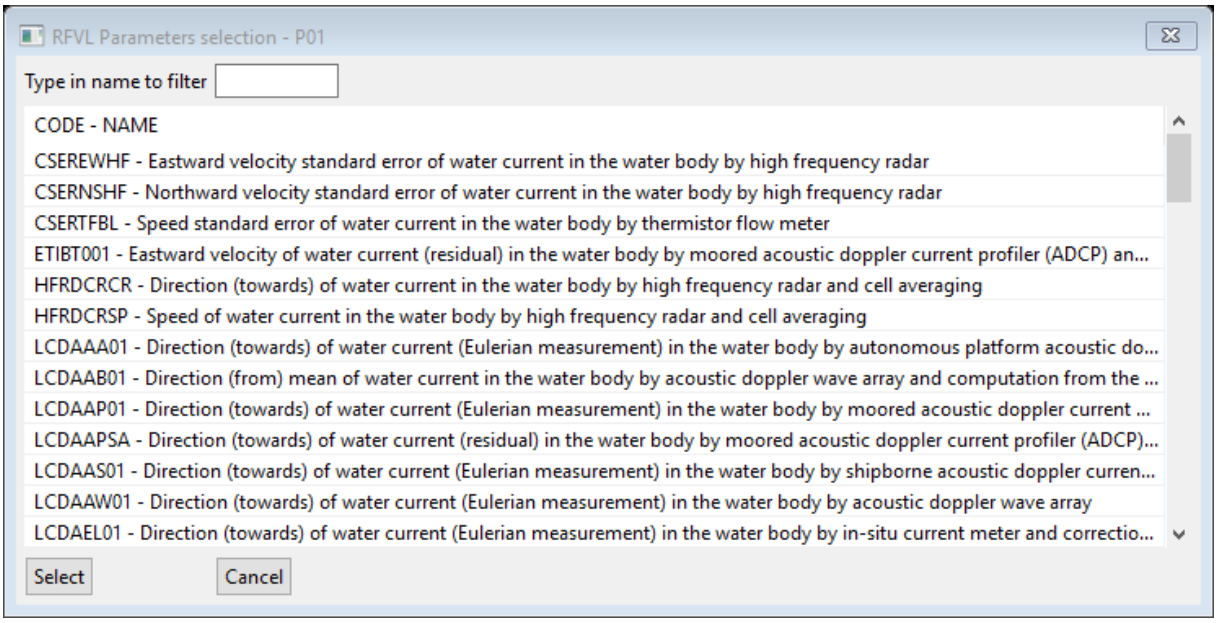
7.4.2.2. Using the "P01 via P09" parameter list

To add a parameter in the table, right-click on the data table and click on *Add a parameter*.

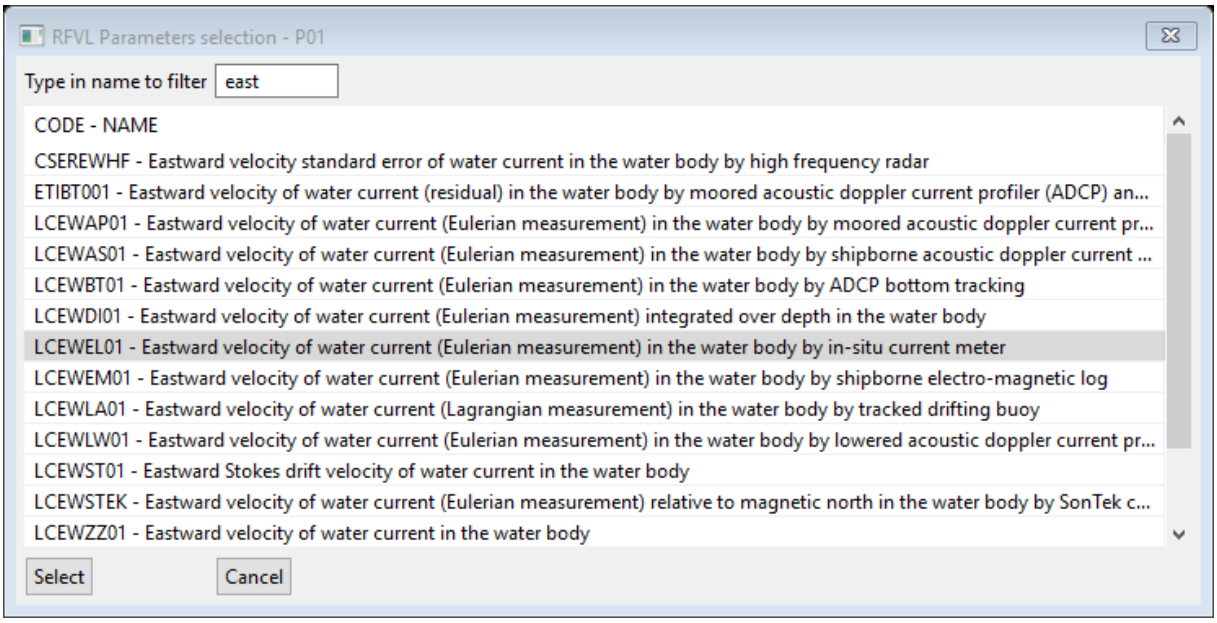
It opens a parameter selection window listing P09 parameters.

The parameters selection window displays the P09 list of SeaDataNet (**MEDATLAS codes** for parameters), as in the previous case (using the P09 parameters list).

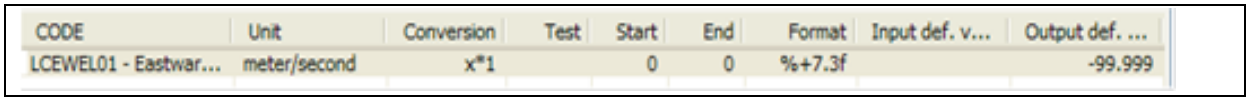
The selection of a parameter in this list opens a second window, displaying the P01 parameters list:



Select a parameter in this list (use filter to find a specific parameter, in the example below there is a filter on “east”).



Then press “Select” to add the selected parameter in NEMO’s table, with some values filled by default. The default and the format values linked to the parameter are downloaded in the parameters list of the NEMO Web service



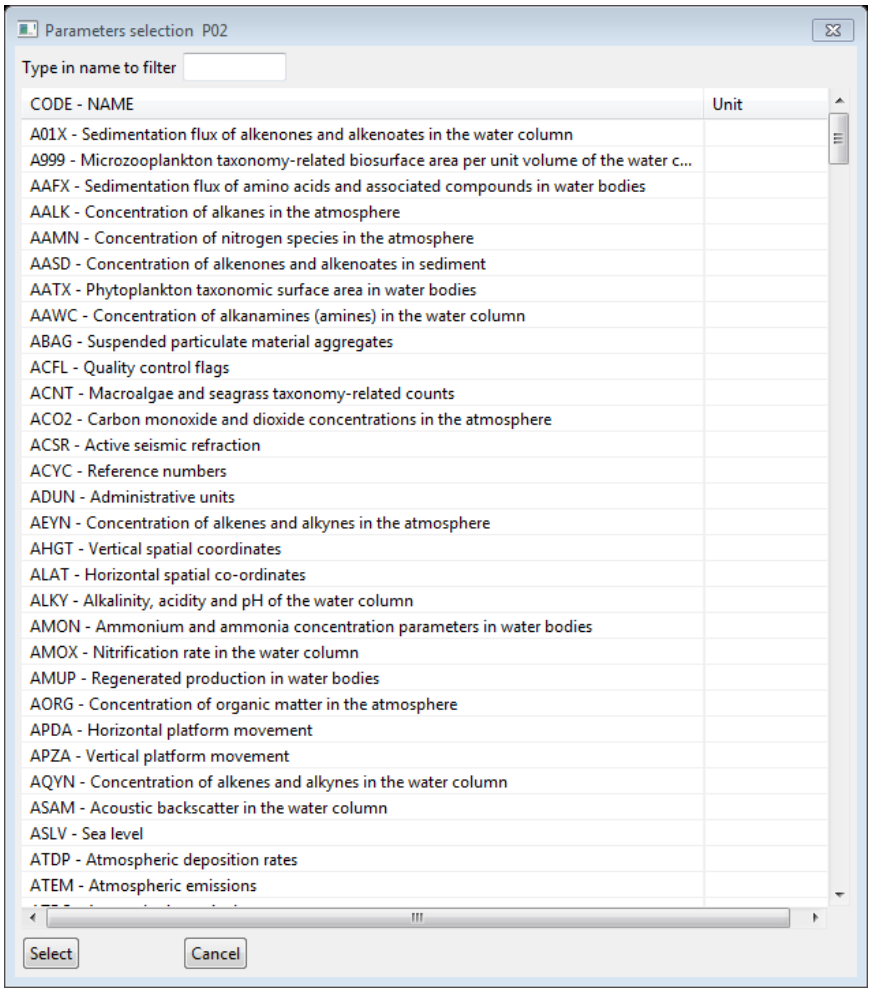
CODE	Unit	Conversion	Test	Start	End	Format	Input def. v...	Output def. ...
LCEWEL01 - Eastwar...	meter/second	x*1		0	0	%+7.3f		-99.999

Input default value (and output default value if MEDATLAS) can be manually modified. The format can be manually modified if the parameter is numerical.

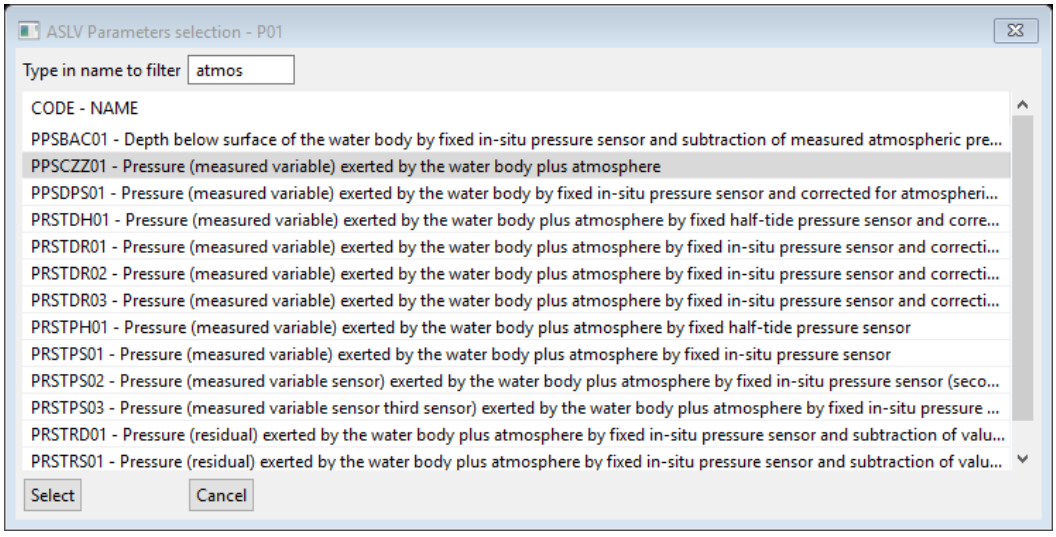
7.4.2.3. Using P01 via P02 parameter list

To add a parameter in the table, right-click on the data table and click on the Parameter list, menu.

It opens a parameters selection window listing P02 parameters.



The selection of a parameter in this list opens a second window, displaying the P01 parameters list:



Select a parameter in this list (use filter to find a specific parameter

Then press “Select” to add the selected parameter in NEMO’s table, with some values filled by default.

CODE	Unit	Conversion	Test	Start	End	Format	Input def. v...	Output def. ...
PPSCZZ01 - Pres...		x*1		0	0			

For numeric parameters, unit, Format, input default value) can be input.

For non-numeric parameters, an input default value can be set. The unit cannot be modified.

To set a unit, right-click on the parameter and select "*select a P06 unit*" in the context menu.

The unit can be also modified using this context menu.

7.4.2.4. Fulfill parameter values and test

7.4.2.4.1. T column

This column is only available in ODV format.

Check the checkbox to indicate that the parameter is non-numeric (ie. Geological description)

7.4.2.4.2. Label

This column is available only

if you use ODV as conversion format

AND

if you use P01 parameters (P01viaP02 or P01viaP09)

In other cases, this column will be hidden.

This field is used to choose **your parameter label** for conversion.

By default, the parameter label (i.e. column title in ODV and SDN mapping) is the P01 parameter code.

If you put a value in this field, this value will be used instead of the parameter P01 code.

If you use this column, P01 codes / personal labels mapping will be saved in a file:

under [NEMO_installation_directory]\ resources\userParametersLabels.xml.

Already saved personal labels will be automatically filled by NEMO.

You can always modify them in the parameter table. This will update the mapping file.

7.4.2.4.3. Standard name

This column is available only in netCDF format.

The standard name is not mandatory in netCDF but is **highly recommended** for CF compliance. So if a standard name corresponds to the measured parameters, it is recommended to use one.

7.4.2.4.4. Conversion

This field is used to input a conversion formula which should be like x*1000+3; with x the value read in the input file(s). This field is not writable for non-numeric parameters.

Example:

In the example below, the East component of the current is given in millimetres/second; as in the output file, it is in metres/second, a 0.001 factor has to be applied to the value read in the input file.

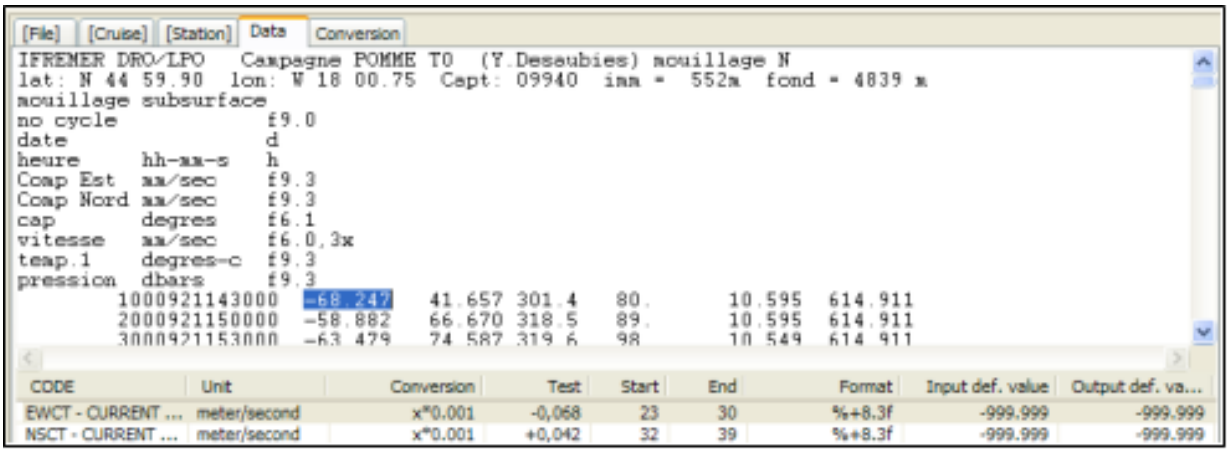


Figure 23 - Example of an input value converted through a formula

7.4.2.4.5. Test

This field displays the value as it will be written in the output file (taking into account the format input and the conversion formula, if any, by the user).

To input value in the test field, right-click in the table and choose “Update test” in the context menu; the start and end fields must have been input before.

In the Figure 23 example, the test value takes into account the conversion formula and the output format (column format) which says 3 decimal digits.

7.4.2.4.6. Start-End/ Column number

These fields indicate the start character and the end character or the column number of the parameter in the data line.

To input the values in these fields, you have to:

- Select the parameter line,
- right click to open the context menu and choose *Set start/end* or *Set column number*,
- select the value of the parameter in the first line of the data file for a text file without separators, or select the header of the column of the parameter for a CSV file displayed as columns.

.

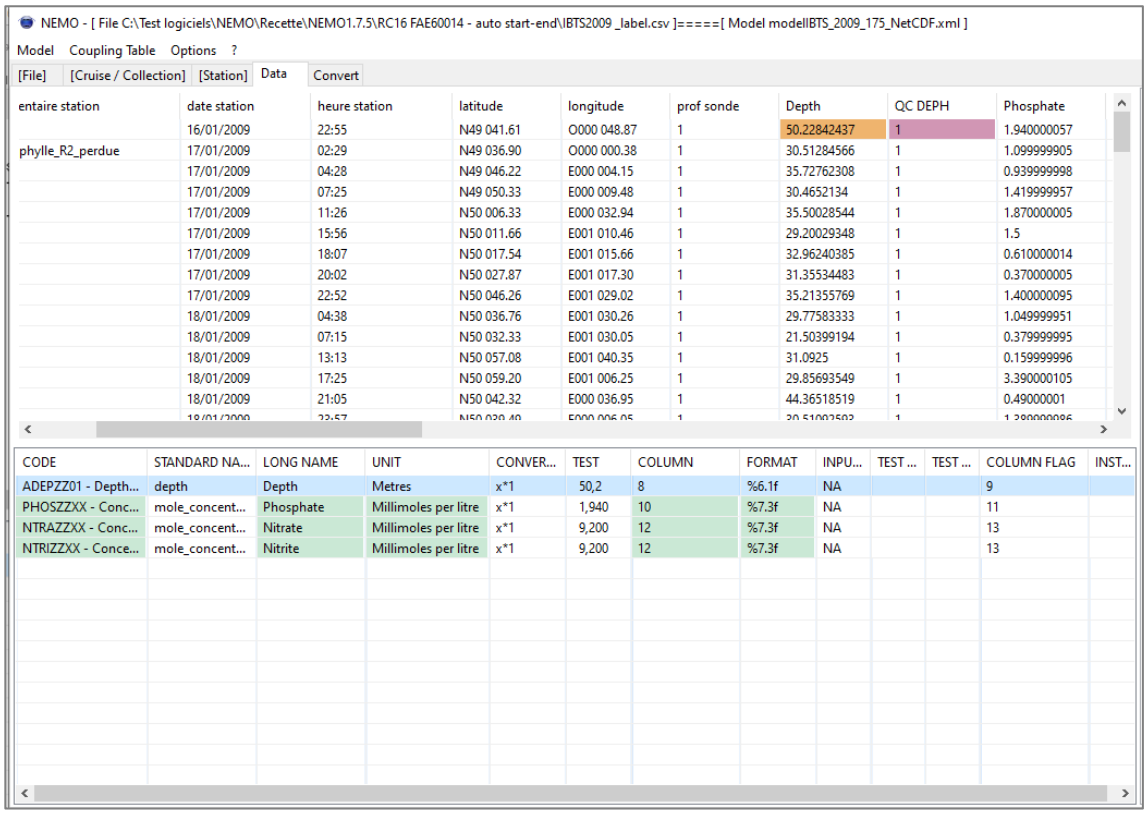


Figure 24 – Data screen - the input file is a CSV file

Figure 24 shows the results on a CSV file when all parameters have been input. The selected parameter DEPH appears in grey in the parameter list and is shown in orange (column 8) in the CSV file, if there is an associated flag, it appears in purple.

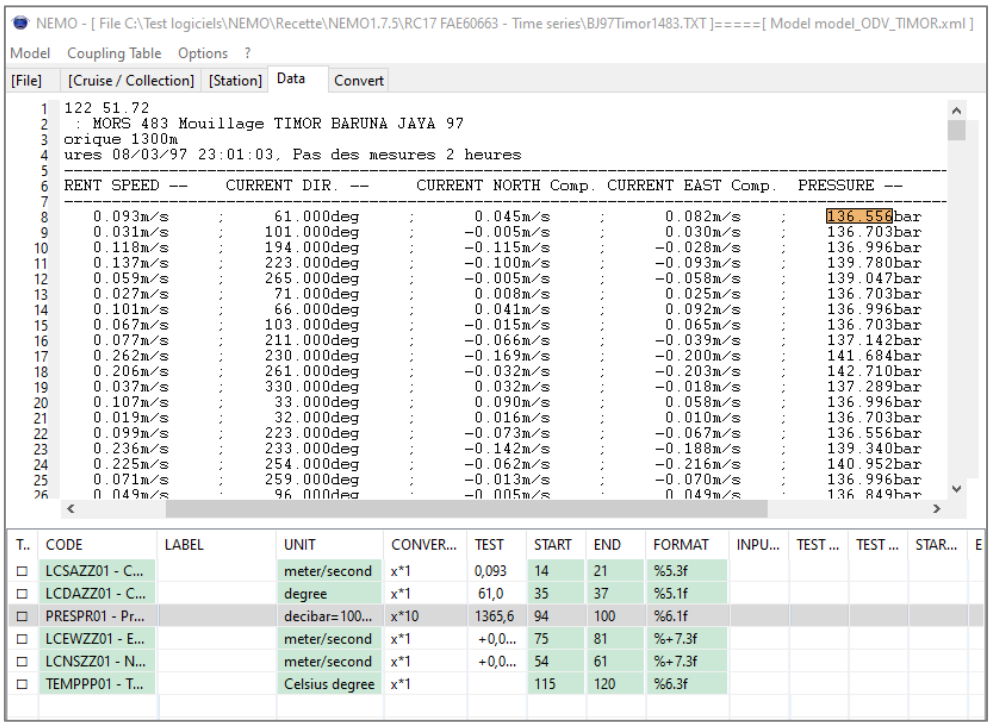


Figure 25 – Data screen – the input file is a text file without separators

Figure 25, shows the results on a text file without separators when all parameters have been input. The selected parameter PRESPR01 appears in grey in the parameter list and is shown in orange (from character 94 to character 100) in the text file.

Remark: for text files without separators, do not forget to take the maximum length of the value into account; it may not be the same length as the one on the first line of data.

Example:

In Figure 25, the first value of the current direction is 61.000

You have to select additional blank spaces to take into account further values that contain more digits like 101.000 on the second line (one additional character has to be selected) or the default value that could be -9999. (two additional characters have to be selected).

7.4.2.4.7. Autofill next parameter column

This can be done if **the input file is a CSV file** and if **the parameter list in NEMO is in the same order as the parameters in the file**. You can then proceed to the following steps:

- Once you have entered all parameters in the parameter list, **select the column number of the 1st parameter of the list**
- With the cursor on a parameter line with already a column number, right-click and choose "*Auto-Fill next parameter column*", this will open the following window:

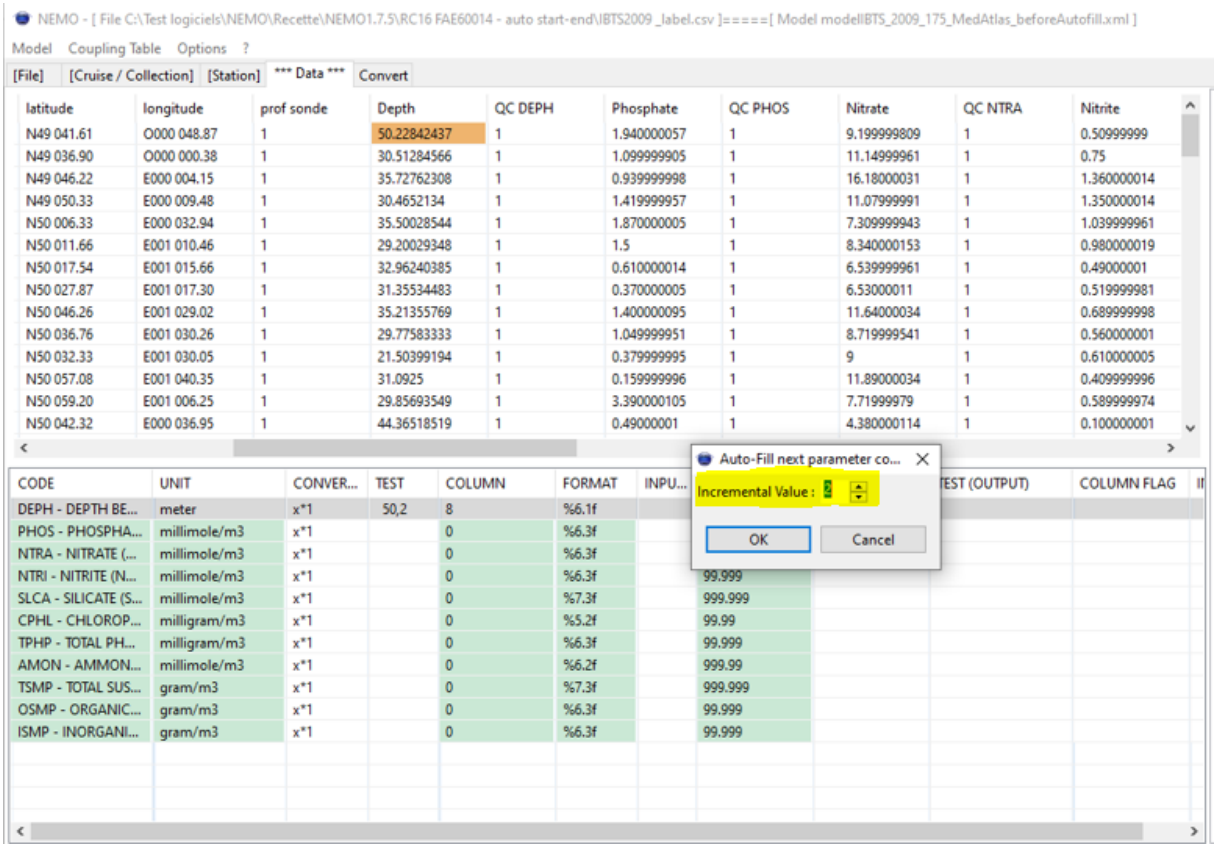


Figure 26 – Data screen – Auto-Fill next parameter column window

- Choose 1 if the parameter columns are every column in the input file, and choose 2 if the parameter columns are every 2 columns in the input file like in the example of Figure 26
- Click on OK
- All the column number of the parameters are automatically filled as shown below:

CODE	UNIT	CONVER...	TEST	COLUMN	FORMAT	INPU...	OUTPUT DEF. ...	T
DEPH - DEPTH BE...	meter	x*1	50,2	8	%6.1f		-999.9	
PHOS - PHOSPHA...	millimole/m3	x*1		10	%6.3f		99.999	
NTRA - NITRATE (...	millimole/m3	x*1		12	%6.3f		99.999	
NTRI - NITRITE (N...	millimole/m3	x*1		14	%6.3f		99.999	
SLCA - SILICATE (S...	millimole/m3	x*1		16	%7.3f		999.999	
CPHL - CHLOROP...	milligram/m3	x*1		18	%5.2f		99.99	
TPHP - TOTAL PH...	milligram/m3	x*1		20	%6.3f		99.999	
AMON - AMMON...	millimole/m3	x*1		22	%6.2f		999.99	
TSMP - TOTAL SUS...	gram/m3	x*1		24	%7.3f		999.999	
OSMP - ORGANIC...	gram/m3	x*1		26	%6.3f		99.999	
ISMP - INORGANI...	gram/m3	x*1		28	%6.3f		99.999	

7.4.2.4.8. Format

This field describes the output format (in the output file) of the measured parameter, **including the format of the default value**.

The user has to describe the output format within the following:

%*x*d: x = number of digit,

d for integer

%3d ➔ 150

%5d ➔ 15000

%+*x*d: same than %*x*d but for signed values

%+4d ➔ +150 or -150

%+6d ➔ +15000 or -15000

%*x.y*f = x= total number of digits included the decimal point

y= number of digits to the right of the decimal point

f: for decimal number

%6.3f ➔ 12.124

%5.1f ➔ 123.4

%7.5f ➔ 1.12345

%+*x.y*f : same than %*x.y*f but for signed values

%+6.3f ➔ +12.124 or -12.123

%+5.1f ➔ +123.1or -123.1

%+7.5f ➔ +1.12345 or -1.12345

Input def. value:

This field describes the values found in the **input file** where the parameter is not measured.

This input value can be any type of character (number, alphabetic). **It must be kept empty if the input default value is empty.**

7.4.2.4.9. Output def. value

This field describes the values written in **the output** file where the parameter is not measured.

It is not used in ODV format (where the default value is an empty string) nor in netCDF format (where the default value is always NaN). It is used in MedAtlas format only, where the output value must be a

number (often a suite of '9') in the same format as the measured parameters described in the format column.

7.4.2.5. Automatic filling of the parameter lines

This functionality, added in NEMO 2.0, allows the user to automatically input the data lines, **if the parameter codes (P01 or P09) exist in the input data file(s)** and if the line containing these codes has been input in the File Tab, fields "*The P09 parameter codes are in the input file*" and/or "*The P01 parameter codes are in the input file* " (see §7.1.3.5).

With these 2 conditions met, on the Data tab, the *'Auto-Fill*" action is available in the contextual menu of the parameter table as shown in Figure 27.

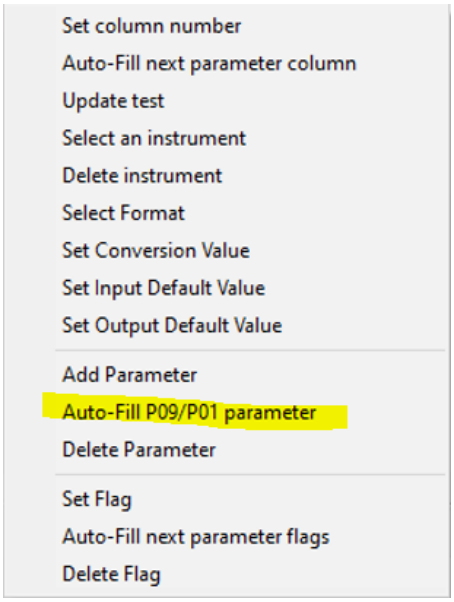


Figure 27 –Auto-Fill P09/P01 parameter available

Clicking on the *Auto-fill P09/P01 parameter* gives the result shown in Figure 28: the field CODE, UNIT, START, END, FORMAT, and OUTPUT format are automatically filled-in in the parameter list.

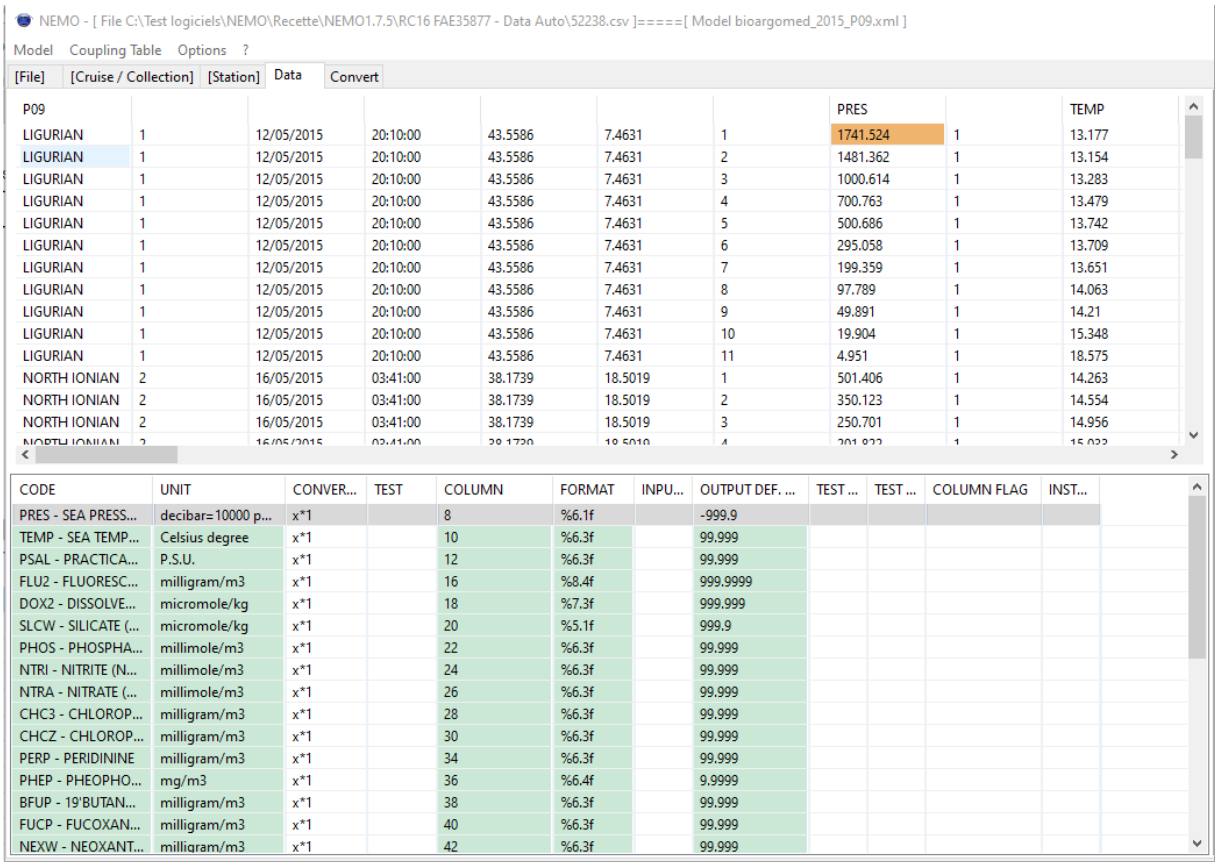


Figure 28 – Data screen – Parameter lines automatically filled in with P09 codes using the *Auto-Fill* menu

The user has to check that the autofill is correct and more particularly the units and the format automatically generated; the user also may have to complete the information with default values, instrument ….

Note:

There is a specific case for the MedAtlas transcoding, if the input file contains both P09 and P01 codes: they can be both used, this will allow to use more detailed P01 codes in the SDN_mapping lines than the generic ones used by default for the P09/P01 mapping.

7.4.3. How to move a parameter in the table

The previous “Move current parameter down”, “Move current parameter up”, “Move current parameter down to bottom”, “Move current parameter up to top” have been replaced by the drag and drop function in the table of parameters. You can move one or several parameter(s) by selecting one or several parameter line(s) and then drag and drop it (them) where needed.

7.4.4. How to keep existing quality flags

In the table of measured parameters, information on quality flags that may exist in the input file(s), can be input in the 4 last columns of the table of measured parameters (Test (input), Test (output), Start flag, End flag).

3 choices are available in the context menu of the parameter table: *Set flag*, *Autofill next parameter flags* and *Delete flag*, they are described hereafter

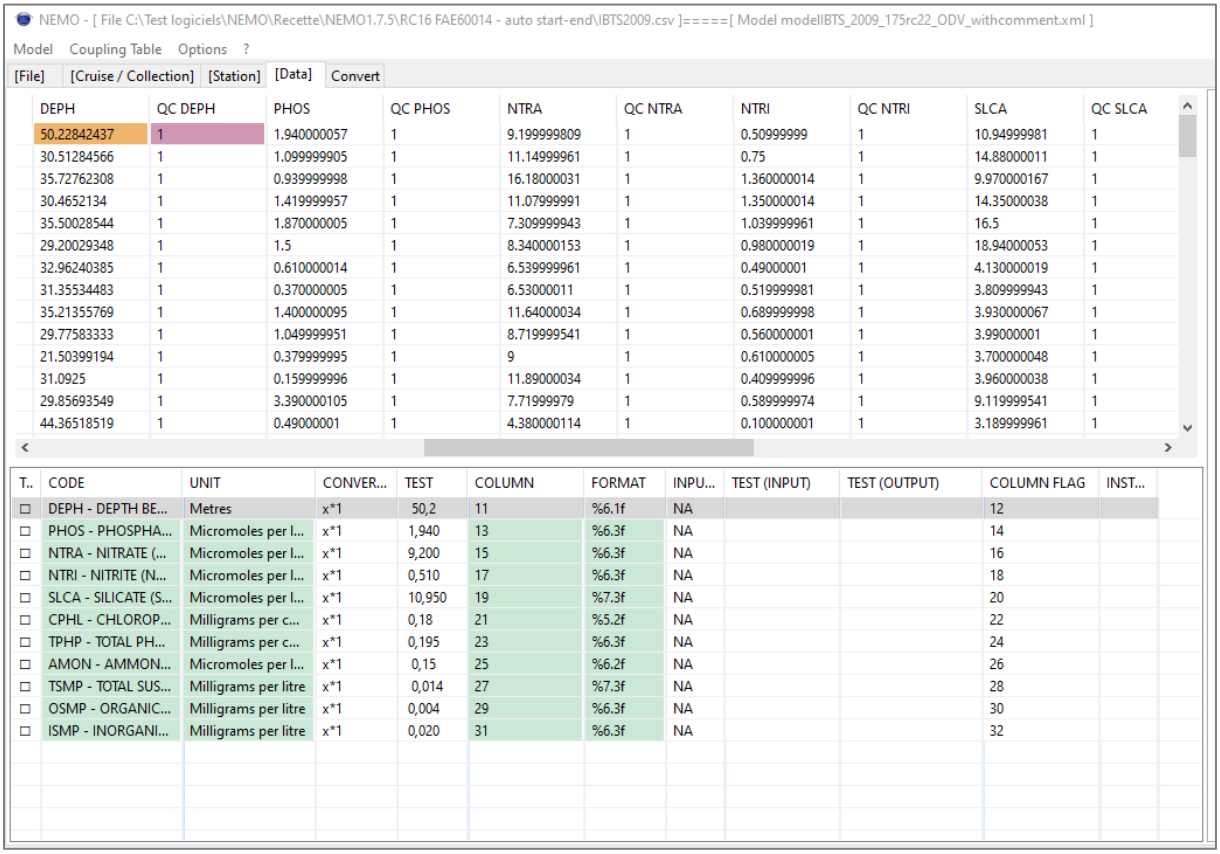
7.4.4.1. Set flag

To input the start and end positions or the column number of quality flag information:

- Select the parameter line,
- Right-click to open the parameter menu and choose *Set flag*,
- Select the value of the flag in the first line of the data file for a text file without separators, or select the header of the column of the flag for a CSV file displayed as columns.

In the example below, the parameter Depth has a quality flag in the 9th column of the data line, the Phosphate on the 11th column… For all of them, the input value of the QC flag is the same as the output value, no conversion of flag scale was necessary (here 1).

The parameter(s) selected in the parameter table (ADEPZZ01 in grey below) and its corresponding quality flag are highlighted in the upper part of the screen (Parameter DEPH in Orange in column 11, flag QC DEPTH in purple in column 12)



DEPH	QC DEPH	PHOS	QC PHOS	NTRA	QC NTRA	NTRI	QC NTRI	SLCA	QC SLCA
50.22842437	1	1.940000057	1	9.199999809	1	0.50999999	1	10.94999981	1
30.51284566	1	1.099999905	1	11.14999961	1	0.75	1	14.88000011	1
35.72762308	1	0.939999998	1	16.18000031	1	1.360000014	1	9.970000167	1
30.4652134	1	1.419999957	1	11.07999991	1	1.350000014	1	14.35000038	1
35.50028544	1	1.870000005	1	7.309999943	1	1.039999961	1	16.5	1
29.20029348	1	1.5	1	8.340000153	1	0.980000019	1	18.94000053	1
32.96240385	1	0.610000014	1	6.539999961	1	0.49000001	1	4.130000019	1
31.35534483	1	0.370000005	1	6.53000011	1	0.519999981	1	3.809999943	1
35.21355769	1	1.400000095	1	11.64000034	1	0.689999998	1	3.930000067	1
29.77583333	1	1.049999951	1	8.719999541	1	0.560000001	1	3.99000001	1
21.50399194	1	0.379999995	1	9	1	0.610000005	1	3.700000048	1
31.0925	1	0.159999996	1	11.89000034	1	0.409999996	1	3.960000038	1
29.85693549	1	3.390000105	1	7.71999979	1	0.589999974	1	9.119999541	1
44.36518519	1	0.49000001	1	4.380000114	1	0.100000001	1	3.189999961	1

T..	CODE	UNIT	CONVER...	TEST	COLUMN	FORMAT	INPU...	TEST (INPUT)	TEST (OUTPUT)	COLUMN FLAG	INST...
☐	DEPH - DEPTH BE...	Metres	x*1	50,2	11	%6.1f	NA			12	
☐	PHOS - PHOSPHA...	Micromoles per l...	x*1	1,940	13	%6.3f	NA			14	
☐	NTRA - NITRATE (...	Micromoles per l...	x*1	9,200	15	%6.3f	NA			16	
☐	NTRI - NITRITE (N...	Micromoles per l...	x*1	0,510	17	%6.3f	NA			18	
☐	SLCA - SILICATE (S...	Micromoles per l...	x*1	10,950	19	%7.3f	NA			20	
☐	CPHL - CHLOROP...	Milligrams per c...	x*1	0,18	21	%5.2f	NA			22	
☐	TPHP - TOTAL PH...	Milligrams per c...	x*1	0,195	23	%6.3f	NA			24	
☐	AMON - AMMON...	Micromoles per l...	x*1	0,15	25	%6.2f	NA			26	
☐	TSMP - TOTAL SUS...	Milligrams per litre	x*1	0,014	27	%7.3f	NA			28	
☐	OSMP - ORGANIC...	Milligrams per litre	x*1	0,004	29	%6.3f	NA			30	
☐	ISMP - INORGANI...	Milligrams per litre	x*1	0,020	31	%6.3f	NA			32	

7.4.4.2. Autofill next parameter flags

Used to fill automatically the QC flag position of all the parameters in the table. This can be done if **the input file is a CSV file** and if **the parameter list is in the same order as the parameters in the file**. You can then proceed to the following steps:

- Once you have entered all parameters in the parameter list, **select the position of the flag of the 1st parameter of the list**
- **With the cursor on a parameter line with an existing flag position ,** right-click and choose "*Auto-Fill next parameter flags*" and proceed as for ***"Auto-Fill next parameter column"*** described before (Figure 22)**.**

7.4.4.3. Delete flag

To delete flag information from the table of measurements:

- Select the parameter line(s) where you want to delete this information
- Click on “Delete flag” in the menu

The current flag scale conversion is the one loaded in the previous step (Paragraph 7.3.17, QC flags).

When the data description is over, click on the “Validate step” (cf. paragraph 5.4) to move to the next step.

7.5. File conversion

This is the last step of NEMO; once the description of the input file(s) is completed, it is possible to run the conversion to either ODV, netCDF, or MEDATLAS format.

This conversion step generates:

- output file(s) in the needed format
- Some mandatory parameters may be added, depending on several criteria (see paragraph 7.5.2)
- If “Generate SeaDataNet CDI summary” is clicked in NEMO settings, a CDI summary file will be created while NEMO is converting the input file(s). It is a Comma Separated Values (CSV) file that is directly usable by Mikado to generate a CDI XML export, corresponding to the stations that are converted to ODV, netCDF, or MEDATLAS format.
- If “Generate mapping for SeaDataNet Replication Manager” is clicked in NEMO settings, mapping information (for all the stations that are converted to ODV, netCDF, or MEDATLAS format) is inserted in the local database of NEMO.

7.5.1. Running file conversion

Click on the “Start conversion” button, then the user is asked:

- to enter a name for the CDI-summary file if “Generate SeaDataNet CDI summary” is clicked in NEMO settings
- to enter a name for the output directory or the output file
- to enter a name for the output directory prefix if “Generate mapping for SeaDataNet Replication Manager” is clicked in NEMO settings. This prefix will be subtracted from the file name in the mapping table.

  For example if

  output file name = *C:\username\NEMO\cruise_name\file_name*

  and output directory prefix = *C:\username\NEMO*

  file name in the mapping table will be: *cruise_name\file_name*

Then the conversion starts and the user is informed about its progression in the “Log” tab at the bottom of the window.

When the conversion stops:

- there may be an error, detailed in the “Log” tab in red, or
- conversion is completed and a green message informs the user that the conversion is OK.

- The corresponding batch command is given in the log window, it can be copied (removing line feeds) to be used in a batch file.

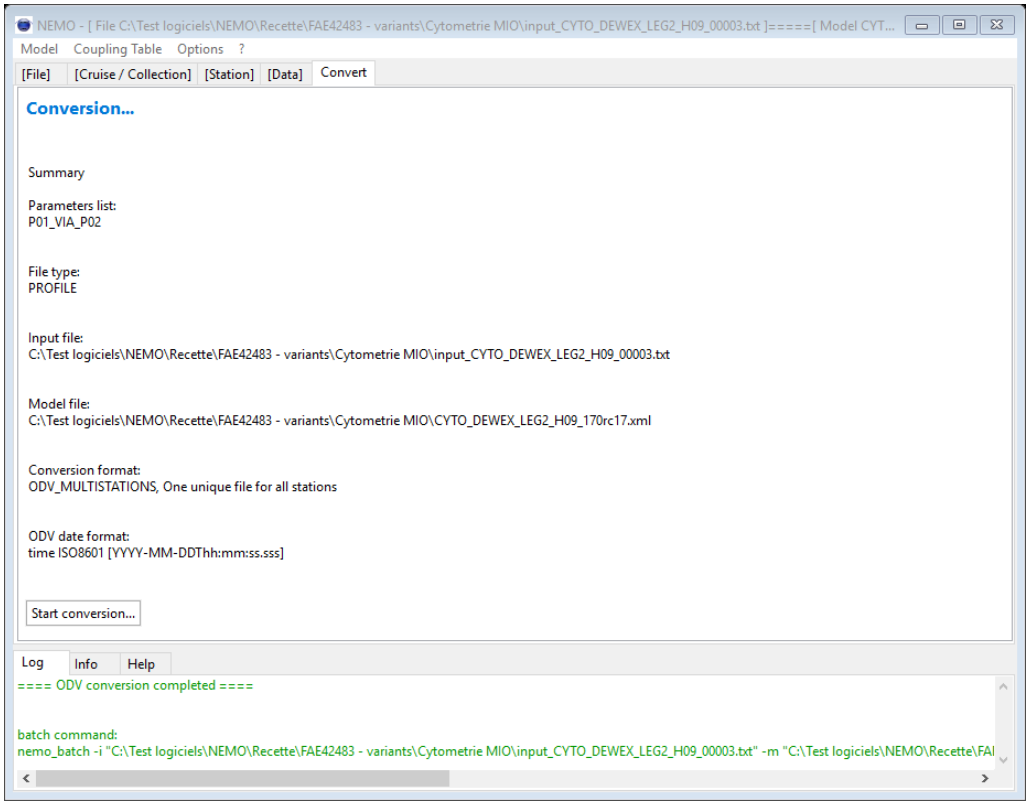


Figure 29 File conversion window, with an ODV conversion completed

7.5.2. Automatic insertion of parameters in the output file(s)

Depending on the chosen output format and the data type (vertical profile, time-series, trajectories) NEMO automatically adds some parameters to the output file.

7.5.2.1. MEDATLAS format

- Time series
    - YEAR, MNTH, DAYX, and TIME are 4 mandatory parameters for time series in MEDATLAS format.
      These 4 parameters are automatically added by NEMO, in the output MEDATLAS file, from data and time read in the files and described in the station tab, or computed from the start date and the sampling rate of the time series (test p5).
- Trajectories
    - YEAR, MNTH, DAYX, and TIME are 4 mandatory parameters for trajectories in MEDATLAS format.
      These 4 parameters are automatically added by NEMO, in the output MEDATLAS file, from data and time read in the files and described in the station tab, or computed from the start date and the sampling rate of the data (test p5).

- LATX (latitude) and LONX (longitude) are mandatory parameters for trajectories in MEDATLAS format.
  These 2 parameters are automatically added by NEMO, in the output MEDATLAS file, from the latitude and longitude read in the files and described in the station tab (test p8).
- If bottom depth is read in the files and described in the station tab, the parameter BATH (bathymetric depth) is added automatically in the output MEDATLAS file. (test p4)

7.5.2.2. ODV format

- Time series
  - Depth is the mandatory vertical reference for time series at ODV format for SeaDataNet.
    If depth is not in the parameter table, depth is automatically added by NEMO, as a constant value equal to the sensor depth described in the station tab.
  - Time is automatically added by NEMO, in the output ODV file, from data and time read in the files and described in the station tab, or computed from the start date and the sampling rate of the time series. The format is time ISO8601 or chronological Julian date depending on the default time format chosen in NEMO settings.
- Trajectories
  - If depth is not in the parameter table, and if the sensor depth is described in the station tab, then depth is automatically added by NEMO, as a constant value equal to this sensor depth.

7.5.2.3. netCDF format

- Trajectories
  - If depth is not in the parameter table, and if the sensor depth is described in the station tab, then depth is automatically added by NEMO, as a constant value equal to this sensor's depth.

7.5.3. Automatic insertion of SeaDataNet References

This part is very important to keep track of the metadata and to allow links between SeaDataNet catalogues (linked data). For example, if the CSR of the collecting cruise is inserted in the data file as a *sdn_reference*, it will be possible to access the data directly from the CSR catalogue.

Several *sdn_reference* are inserted in the file, depending on the metadata provided :

- **CDI references** are automatically written in the output file.

<sdn_reference

xlink:href="https://cdi.seadatanet.org/report/edmo/10/cruiseRef_00001_H09"
xlink:role="isDescribedBy" xlink:type="SDN:L23::CDI" sdn:scope="10:cruiseRef_00001_H09"/>

- If the local CSR Id is set in the Cruise tab, **CSR references** are automatically written in the output file:

<sdn_reference xlink:href=" https://csr.seadatanet.org/report/edmo/486/localCSR/xml" xlink:role="isObservedBy" xlink:type="SDN:L23::CSR"/>

- If the central CSR Id is set in the Cruise tab, **CSR references** are automatically written in the output file:

<sdn_reference xlink:href=" https://csr.seadatanet.org/report/edmo/Central_CSR_reference/xml xlink:role="isObservedBy" xlink:type="SDN:L23::CSR"/>

- If SHIP is set in the Cruise tab, **SHIP reference**s are automatically written in the output file

<sdn_reference xlink:href="https:/www.seadatanet.org/urnurl/SDN:C17::35AY" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"/>

- If EDMERP codes are given in the Cruise tab, **EDMERP reference**s are automatically written in the output file

<sdn_reference xlink:href="https://edmerp.seadatanet.org/report/12297" xlink:role="isObservedBy" xlink:type="SDN:L23::EDMERP"/>

7.5.4. CDI summary file for MIKADO

If "*Generate SeaDataNet CDI summary*" is selected in NEMO settings, NEMO generates a CDI summary CSV (Comma separated value) file to be used by MIKADO [3].

7.5.4.1. Description of the CDI summary file

This CSV file contains all the necessary information for the generation of a SeaDataNet XML CDI file. The content of the CSV summary file for CDI is described in the following table:

Name (MIKADO var)	Content	Comment
LOCAL_CDI_ID	CDI ID in the data centre generating the CDI	[Cruise reference]_[Station number]_[Data_type] Example: FI352002200040_00005_H10 Or [data set reference]_[Station number]_[Data type] Example: XBT_2002_00005_H13 :
EDMO AUTHOR (var01)	EDMO ID of the data centre responsible for the CDI	Input in NEMO settings
AREA_TYPE (var02)	Type of measurement	SeaDataNet Geospatial Feature Types (SeaDataNet common vocabulary, List L02) Set to 'Point' If vertical profiles and time series and to 'Curve' if trajectories
DATASET_NAME (var04)	Name of the dataset	Set to 'Not Specified', if cruise, set to Cruise Name, if dataset reference exists set to dataset reference
DATASET_ID (var05)	Dataset_ID	Set to 'Not Specified', if cruise set to Cruise reference, if dataset reference exists set to dataset reference
DATASET_REV_DATE (var06)	Date of last revision of the dataset	Date of the day in ISO format YYYY-MM-DDTHH24:MI:SS
EDMO_ORIGINATOR (var07)	EDMO_ID of the dataset originator	Input in NEMO settings
DATASET_ABS (var08)	Abstract describing the dataset	Set to the "Cruise comment" content from NEMO Cruise tab (if empty Set to 'Not specified') or to the –CruiseComment argument in batch mode
EDMO_CUSTODIAN (var09)	EDMO code of the organisation managing the dataset	Input in NEMO settings
P02_CODE (var10)	Measured parameters	BODC Parameter Discovery Vocabulary (SeaDataNet common vocabulary, List P02). The mapping between MEDATLAS codes input with NEMO and P02 is done automatically.
L05_CODE (var11)	L05 code for the sensor	A récupérer en faisant un mapping à partir du code C77 (data type) de l'onglet station
PLATFORM_TYPE (var12)	Platform class	SeaDataNet Platform Classes (SeaDataNet common vocabulary, List L06). To be input by the user.
EDMERP_CODE (var13)	Code of the associated project	Set to the values of the field project of the Cruise Tab, if there is only one EDMERP_CODE. If several EDMERP_CODE see §7.5.4.2
DATASET_ACCESS (var14)	Dataset access restrictions	SeaDataNet Data Access Restriction Policies (SeaDataNet common vocabulary, list L08). To be input by the user.
CRUISE_NAME (var15)	Cruise name	If cruise: set to cruise name If collection of files grouped by cruise: set to the name of the directory If collection of files not grouped by cruise = set to 'Not specified'

CRUISE_ALT_NAME (var16)	An alternative name for the cruise	Set to Local CSR identifier or Central CSR reference (Cruise tab)
CRUISE_START_DATE (var17)		Set to the Start date (cruise Tab), and if empty to the Date of the first station (format YYY-MM-DD)
STATION_NAME (var18)	Station name	Set to station number
STATION_DATE (var20)	Date of the station YYYY-MM-DD	
SAMPLING_RATE (var22)	Sampling rate	Set to the value of the sampling rate field (Station Tab) if given or calculated from the TIME values of the input file.
SAMPLING_RATE_UNIT (var23)	Unit of the sampling rate	Set to the P06 code for Seconds = UTBB
STATION_LONGITUDE or WEST_LONGITUDE (var24)	Longitude of the station Decimal degrees	If Vertical profile or time series the field name is STATION_LONGITUDE and is the station longitude. If Trajectories the field name is WEST_LONGITUDE and is the Westernmost Longitude of the trajectory
EAST_LONGITUDE (var25)	Easternmost Longitude of the trajectory Decimal degrees	Only for trajectory, is the Easternmost Longitude of the trajectory
STATION_LATITUDE or SOUTH_LATITUDE (var26)	Latitude of the station Decimal degrees	If Vertical profile or time series the field name is STATION_LATITUDE and is the station latitude. If Trajectories the field name is SOUTH_LATITUDE and is the Southernmost Latitude of the trajectory
NORTH_LATIITUDE (var27)	Northernmost Longitude of the trajectory Decimal degrees	Only for trajectory, is to the Northernmost Latitude of the trajectory
STATION_START_DATE (var28)	Start date of the station YYYY-MM-DDTHH:mi:ss	Data and time of the station
STATION_END_DATE (var29)	Start date of the station YYYY-MM-DDTHH:mi:ss	If vertical profile: station start date + 1:00 hour If trajectories and time series date and time of the last measurement
MIN_DEPTH (var30)	Minimal depth of the measurements Metres	Extraction from the measurements For time-series and trajectory = to MAX_DEPTH
MAX_DEPTH (var31)	Maximal depth of the measurements metres	Extraction from the measurements For time-series and trajectory = to MIN_DEPTH
BOTTOM_DEPTH (var35)	Bottom depth metres	Not available for trajectories
EDMO_DISTRIBUTOR (var36)	EDMO code of the organisation distributing the dataset	Input in NEMO settings
FORMAT (var37)	Format Type of file	In Nemo : If MedAtlas : MEDATALAS If ODV: ODV If netCDF: CFPOINT
FORMAT VERSION (var38)	Version of file format	Input in NEMO settings

DATA_SIZE (var39)	Size of the data file	For profiles and time-series: If one file per station = Size of the file in Mbytes If one file per cruise: Size of the Cruise file/number of stations in Mbytes for trajectories: the size of the file in Mbytes
DIST_WEBSITE (var40)	Distribution website	Must be set to « http://www.sdn-taskmanager.org/ » Input in NEMO settings
DIST_METHODE (var43)	Distribution method	SeaDataNet data access mechanisms (SeaDataNet common vocabulary, List L07). Input in NEMO settings
L22_CODE (var49)	Instrument code	Set to the L22 code of the Data Tab
CENTRAL_CSR_REFERENCE (var81)	Reference of the cruise in the CSR central catalogue	Set to the Central CSR reference (cruise Tab) or if empty retrieved from the CSRCodeList.xml file (with the EDMO code of the organization creating the CSR metadata (NEMO Settings) and the LOCAL CSR Identifier (Cruise Tab). Left to empty if not found

7.5.4.2. CDI_SUMMARY_EDMERP file

When creating the CDI-SUMMARY, if several projects are attached to the Cruise, then a text file is created with the name CDI_SUMMARY+_EDMERP ;

This text file contains the following information: in columns, separated by tabs:

- LOCAL_CDI_ID
- EDMERP_CODE

Example of content for a file with 2 Stations and a cruise linked to 35 projects (EDMERP):

LOCAL_CDI_ID EDMERP_CODE
FI35201805100_00001_H10 12297
FI35201805100_00001_H10 11760
FI35201805100_00001_H10 11824
FI35201805100_00001_H10 12222
FI35201805100_00001_H10 11828
FI35201805100_00002_H10 12297
FI35201805100_00002_H10 11760
FI35201805100_00002_H10 11824
FI35201805100_00002_H10 12222
FI35201805100_00002_H10 11828

7.5.4.3. CDI_SUMMARY_CURVES file

When NEMO converts a trajectory file, and the creation of a CDI_Summary is requested, the track of the trajectory is generated in a CDI_SUMMARY_CURVE.txt separate file, which will be used to fill in the **var 60** (Curves-description), **var 62** (Curves-name) and **var 63** (Curves-coordinates) of MIKADO.

This text file contains the following information in 4 columns, separated by tabs:

- LOCAL_CDI_ID
- CURVES-DESCRIPTION

- CURVES-NAME
- CURVES-COORDINATES

Example of the file content

LOCAL_CDI_ID	*CURVES-DESCRIPTION*	*CURVES-NAME*	*CURVES-COORDINATES*
FABB_2008a_TS_00001_H71	*CURVE 1*	*CURVE 1*	*-4.9231 48.2812 -4.9085 48.2784...*
FABB_2008a_TS_00001_H71	*CURVE 2*	*CURVE 2*	*-4.7986 48.5539 -4.9758 48.5509...*
FABB_2008a_TS_00001_H71	*CURVE 3*	*CURVE 3*	*-8.3748 43.3897 -9.0286 43.4300...*
FABB_2008a_TS_00001_H71	*CURVE 4*	*CURVE 4*	*-11.5717 40.9605 -11.8378 40.5348...*
FABB_2008a_TS_00001_H71	*CURVE 5*	*CURVE 5*	*-19.4222 33.0384 -20.0088 33.1444...*
FABB_2008a_TS_00001_H71	*CURVE 6*	*CURVE 6*	*-25.1112 23.3122 -25.0293 22.9225…*
FABB_2008a_TS_00001_H71	*CURVE 7*	*CURVE 7*	*-17.4239 14.6727 -17.5027 14.6443…*
FABB_2008a_TS_00001_H71	*CURVE 8*	*CURVE 8*	*-28.6215 38.5330 -29.1291 38.3438…*
FABB_2008a_TS_00001_H71	*CURVE 9*	*CURVE 9*	*-6.1950 47.4430 -6.7459 47.5800…*

At the same time, a ***.gpx*** file is created to facilitate the display of a route in GPS software to check that there are no mistakes and wrong locations of the track. This file can easily be opened in online tools (like for example http://www.gpsvisualizer.com/).

Note: to recover the Longitudes, Latitudes of the trajectories, an algorithm has been implemented to limit the number of listed values to the maximum (only the changes of direction are kept), not to cross the terrestrial parts, not to join 2 points if there is an interruption in the measurement, and not to keep duplicate points

A new CURVE is created in case of passage through the anti-meridian, and in case of interruption of the measurement for a sufficient time for two consecutive points to be distant from each other.

7.5.4.4. USE of the CDI-SUMMARY files by MIKADO

To use the CDI_SUMMARY, CDI_SUMMURY_EDMERP, and CDI_SUMMARY_CURVES file(s) with MIKADO to generate an export of XML CDI records, refer to Mikado's user manual [3].

7.5.5. Coupling table for SeaDataNet Replication Manager

If "Generate mapping for SeaDataNet Replication Manager" is clicked in NEMO settings, for all conversions of data files NEMO will insert records in the coupling table which exists in the local database of NEMO. NEMO inserts one record for LOCAL_CDI_ID.

The coupling table contains the following information:

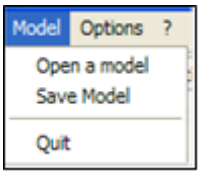
- LOCAl_CDI_ID,
- Modus = 1 (for 1 station per file), 3 (for multi-station files)
- Format (which is ODV or MEDATLAS)
- File name as described in paragraph 7.5.1.
- Date of creation

LOCAL_CDI_DI + format is the unique index of the coupling table.

This coupling table is used to create a coupling file used by SeaDataNet Replication Manager to make the mapping between a LOCAL_CDI_ID (one profile, one time-series, or one trajectory) and the name of the file containing this LOCAl_CDI_ID.

7.6. NEMO models

The “Model” menu of NEMO allows one to save a model or to open an existing model:



7.6.1. Save a model

NEMO can save the model to let the user reuse it for a similar dataset. A full description of a dataset isn’t mandatory.

By default, the model is saved as an XML file, in the default ‘models directory’ field in NEMO settings.

The extension of the model file is “.xml”.

7.6.2. Open an existing model

A user can open an existing model to apply it with or without modification to a new dataset.

The user must first enter the type of data to process (Cruise or collection), then select the file or the directory to be processed before opening the model.

Opening a model before having selected input file(s) or directory results in an error message.

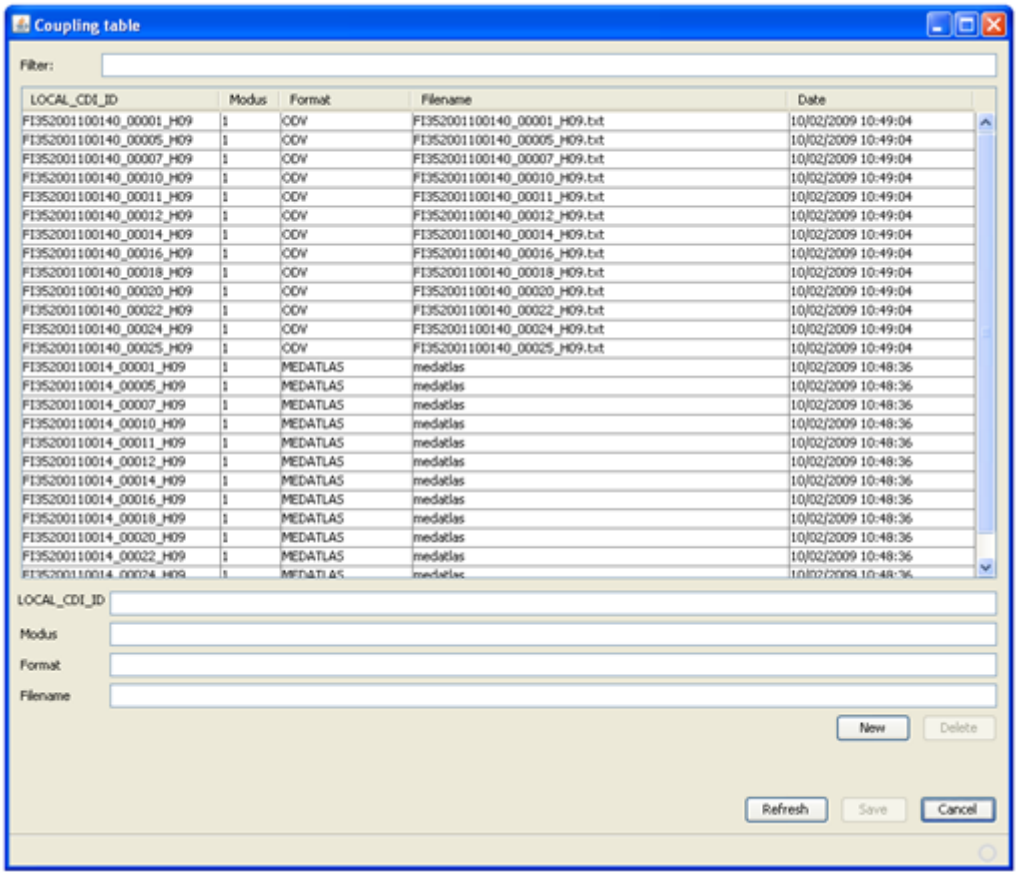
If the model is not fully validated an information message is displayed.

7.7. Coupling table management

The “Coupling Table” menu of NEMO allows for managing the content of the mapping table defined in paragraph 7.5.5.

7.7.1. Edit the coupling table

This function allows editing the content of the mapping table and to manage it.



User can:

- Search specific rows in the mapping table using the filter
- Sort the mapping table by clicking the column title
- Delete rows in the mapping table by selecting the row(s) and then clicking on the “Delete” button. The definitive delete is only done after clicking on Save.
- Insert rows manually in the mapping table by typing the LOCAL_CDI_ID, Modus, Format, and Filename in the empty text inputs, then by clicking on New.
- Edit a row by clicking it, then click in one of the editable columns (Modus, Filename, Date) to change it
- Refresh the content of the table from the database. **Refresh is canceling all changes not previously saved.**
- Quit without saving by clicking on Cancel.

7.7.2. Export the coupling table

This export function generates a coupling file that will be used by SeaDataNet Replication Manager for retrieving stations in the files. The default name for this coupling file is “coupling.txt”, but it can be changed in NEMO settings.

The coupling file used by SeaDataNet Replication Manager is unique and called “coupling.txt”. This file must not contain duplicates (the coupling file ID is LOCAl_CDI_ID + format). It’s up to the NEMO user

to create only one file called “coupling.txt” for SeaDataNet purposes by using the coupling table facilities.

The format of this coupling file is the following:

Local_cdi_ID;Modus;Format;File_name

7.7.3. Import a coupling file

The import function allows importing a coupling file, in the same format as previously described (paragraph 7.7.2), into the coupling table.

This can be useful if a user prefers to modify the coupling table using a text editor, he can successively:

- Export the coupling table from NEMO,
- Delete the coupling table in NEMO
- Modify the coupling file in a text editor
- Import the coupling file in NEMO
- Export the new coupling table for SeaDataNet usage

7.8. NEMO in batch mode

NEMO can be run in batch mode if models have been previously defined.

To launch a conversion, use the command ***nemo_batch*** with several arguments:

-i: with the path and name of the input file or directory (mandatory)

-o: with the path and name of the output file or directory (mandatory)

-m: with the path and name of the model (mandatory)

-c: with the format ***odv***, ***medatlas, netcdf*** (mandatory)

-cdiSummary: with the path and name of the CDI summary (optional)

-couplingTableUpdate: (optional) to ask for an update of the NEMO coupling table, if not present the table will not be updated.

-couplingTablePrefix: with the prefix to use in the coupling table (available if –couplingTableUpdate is selected)

-mono: one station per file

-multi: one file with all the stations

-datasetRef: Sets the first part of the filename and the first part of the LOCAL_CDI_ID. Cannot be used when processing a collection.

-cruiseName: sets the cruise name. Overrides the model value.

-***cruiseComment***. Overrides the model value and input the value in the DATASET_ABS field of the CDI_summary file for MIKADO

-shipCode: sets the ship code, and gets the ship name from the C17 list. Overrides the model value.

-localCsrIdentifier: sets the Local CSR Identifier. Checks the identifier validity. Overrides the model value.

-bshCsrReference: sets the central CSR Reference. Checks the identifier validity. Overrides the model value.

Note that -localCsrIdentifier and –bshCsrReference centralCsrReference are mutually exclusive.

To launch an update of external resources (BODC vocabularies, CSR list, EDMO codes, Surveys list), the command is ***nemo_batch*** with only one argument:

-updateVocabs: update external resources

7.8.1. Windows environment

.*bat* file examples:

Copy the text in the boxes in a file named with .bat extension. Do not forget to adapt the text to your data and the conversion type you want.

example1: launch one Nemo batch command

```
“nemo_batch” -m  “C:\testNEMO\models\ mona_ctd_1221_P01.xml” -i “C:\testNEMO\mona_ctd\trav1”
-o “C:\testNEMO\mona_ctd\outputODV” -c odv –multi –cdiSummary “C:\testNEMO\mona_ctd\cdi.txt”
 -couplingTableUpdate -couplingTablePrefix “C:\testNEMO\mona_ctd”
```

example 2: launch Nemo batch on all files in a directory

```
@echo off
REM================================================================================
REM little batch script to call NEMO on several files in the same directory
REM this script must be put in the Nemo installation directory (usually C:\Program Files\NEMO)
REM this file can be used to run Nemo in batch mode on several files using the same model
REM================================================================================

REM set the input directory path in the line below
setinputDir=C:\myData\115518\input\
setoutputDir=C:\myData\output\
setmodelFile=C:\myData\myModel.xml

REM here we loop on all files in the inputDir, except files beginning with "PF_", because these are files created by Nemo
for /f %%a IN ('dir  /b "%inputDir%"*.* ^| find /V "PF_"') do (
REM the line below just displays the current input file name in the console
echo processing file: %%a
REM the line below calls NEMO in batch mode on the current file ("%%a", and creates the output file called as the input, but ending with ".odv"
REM CHANGE HERE the conversion format if needed and the datasetRef
call  nemo_batch -i "%inputDir%%%a" -m "%modelFile%" -o "%outputDir%%%a.odv" -c ODV  -multi -datasetRef myDatasetRef
)
```

7.8.2. Linux environment

On Linux, launch ***nemo_batch*** with the following additional arguments:

-nosplash (mandatory)

-batch (mandatory)

Example of one command line which can be in a shell script file:

```
#!/bin/sh
./nemo_batch -nosplash -batch -m ./testNEMO/models/mona_ctd.xml -i ./testNEMO/mona_ctd/trav1
-o ./testNEMO/mona_ctd/outputODV -c odv
```

7.8.3. Log file

While the batch is running, a log file is created in the NEMO installation directory (*NEMO_installation_directory**Logs**nemoBatch.log* file).

The program appends messages in the log file (one log file per day).

Example of a log file with an error :

2010-05-04 15:43:27,337 [main] INFO nemoBatch / Batch mode starting. Arguments :

2010-05-04 15:43:27,337 [main] INFO nemoBatch / -batch -m C:\Michele\testNEMO1.2.20\modeles\mona_ctd_1221_P01.xml -i C:\Michelex\testNEMO1.2.20\mona_ctd\trav1 -o C:\Michele\testNEMO1.2.20\mona_ctd\outputODV_batch_mono -c odv

2010-05-04 15:43:27,368 [main] ERROR nemoBatch / Input file not found

2010-05-04 15:43:27,368 [main] INFO nemoBatch / Batch mode ended with errors.

Example of log message with no error :

2010-05-04 15:38:11,492 [main] INFO nemoBatch / Batch mode starting. Arguments :

2010-05-04 15:38:11,492 [main] INFO nemoBatch / -batch -m C:\Michele\testNEMO1.2.20\modeles\mona_ctd_1221_P01.xml -i C:\Michele\testNEMO1.2.20\mona_ctd\trav1 -o C:\Michele\testNEMO1.2.20\mona_ctd\outputODV_batch_mono -c odv

2010-05-04 15:38:23,007 [main] INFO nemoBatch / Batch mode successfully ended.

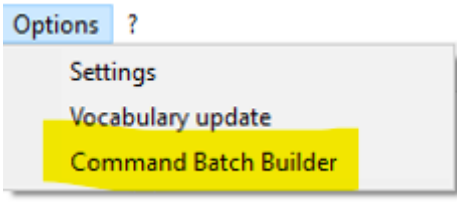
7.8.4. The BatchBuilder tool

Since NEMO 2.0 a new tool has been developed to help the user to write Batch procedures.

This tool allows the creation of batch files for the conversion

- of one file and one NEMO model
- of a set of files that can need to **be converted to the same output format** but with different batch arguments (available in a mapping file or the NEMO model file).

To open the BatchBuilder tool, open the "*Options*" menu of NEMO and choose Command Batch Builder as below:



This will open the windows described hereafter.

7.8.4.1. Creation of a batch command for one file

The window for the creation of a batch command for the conversion of **one file** is shown in Figure 30

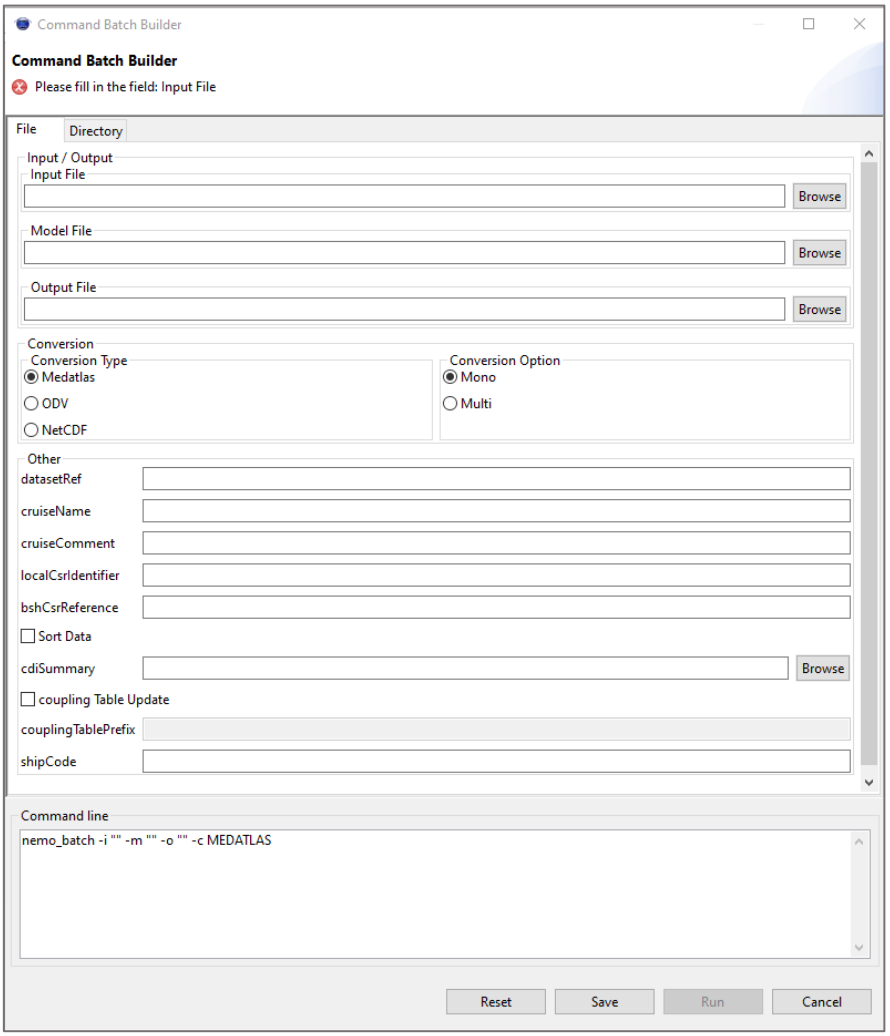


Figure 30 - Creation of a batch command for the conversion of one file

Pay attention to having coherency between the model file and the conversion type (i.e. if the model is for the creation of an ODV file, be sure to have selected ODV as the output format)

If a file and a model are already uploaded in NEMO, the Batch Builder will be prefilled with the values of the model, for example in Figure 31.

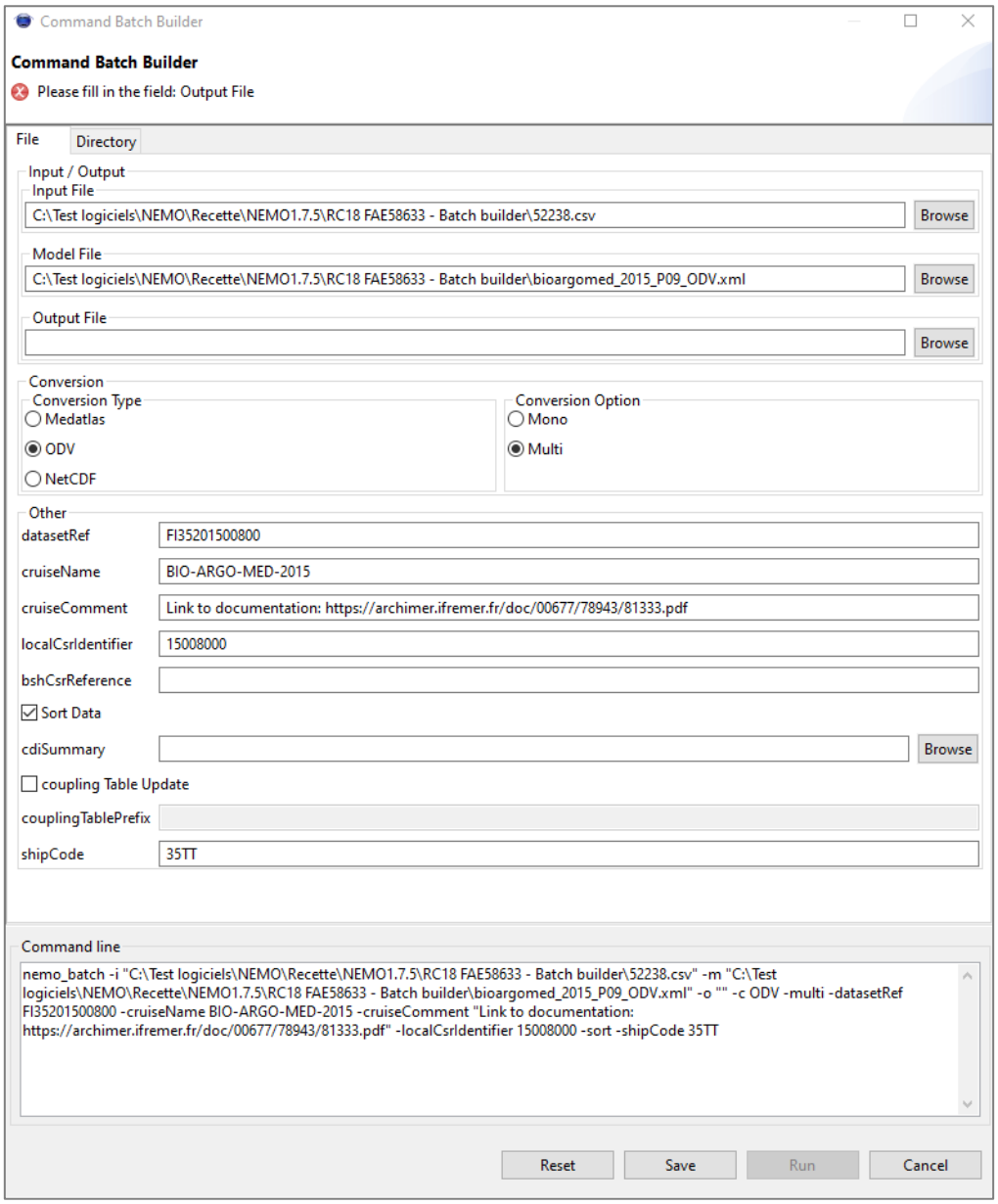


Figure 31 - Batch builder window for the conversion of one file, prefilled with the information of NEMO

The command line at the bottom of the window is automatically updated with the values input in the different fields.

At the bottom of the screen, the 4 buttons can be used for:

- ***Reset*:** Empty all the fields on the screen
- ***Save*:** Save the batch command in a batch file (***.bat*** for Windows and ***.sh*** for Linux), this command can then be used in batch mode.
- ***Run*:** Run the batch command, the log of the run is written in the *nemobatch.log* file in the NEMO installation directory. Note that the *Run* button is active only when all the mandatory fields of the batch are fulfilled (input file, model file, Output file, and conversion Type).
- ***Cancel***: Quit the Batch builder window.

7.8.4.2. Creation of a batch command for one directory

The creation of a batch file for the conversion of a set of files relies on a **Mapping file** that has to be created ahead of using the Batch Builder. **In one mapping file, all the models used should be for the same output format** (i.e.: one mapping file with all models for conversion to ODV, and another mapping file with all models for conversion to NetCDF)

The mapping file is a CSV file, with ';' used as the separator, with all the necessary content of the batch arguments for each file.

It is composed of 10 columns corresponding to the batch arguments which can change from one file to another (the mandatory arguments are in bold characters):

- ***fileNameIn***: name of the input file, without the path
- ***modelName***:: name of the model file, without the path
- ***fileNameOut***:: name of the output file, without the path
- *datasetRef*: Dataset reference
- *cruiseName*: cruise name
- *cruiseComment*: Cruise comment
- *localCsrIdentifier*: Local reference of the CSR
- *bshReference*: central reference of the CSR
- *cdiSummary*: name of the CDI-SUMMARY file, without the path
- *shipCode*: C17 code of the platform

Example of a mapping file for the Batch Builder:

fileNameIn;modelName;fileNameOut;datasetRef;cruiseName;cruiseComment;localCsrIdentifier;bshCsrReference;cdiSummary;shipCode
FI352008090050.txt;gosud_model_odv_Fanindien2008.xml;output_GOSUD_FI352008090050.txt;FI352008090050;MADAGASCAR 2008 - LEG1;cruise off Toamasina;8090050;;summaryFI352008090050.txt;35B5

FI352008090070.txt;gosud_model_odv_Fanindien2008.xml;output_GOSUD_FI352008090070.txt;FI352008090070;FANINDIEN 2008;TSG FANINDIEN;8090070;;summaryFI352008090070.txt;35B5

FI3520080900780.txt;gosud_model_odv_Fanindien2008.xml;outputFI352008090080.txt;FI352008090080;MADAGASCAR 2008 - LEG2;cruise off Toamasina;8090080;;summaryFI352008090080.txt;35B5

The windows for the creation of a batch command for the conversion of a set of files is shown in Figure 32.

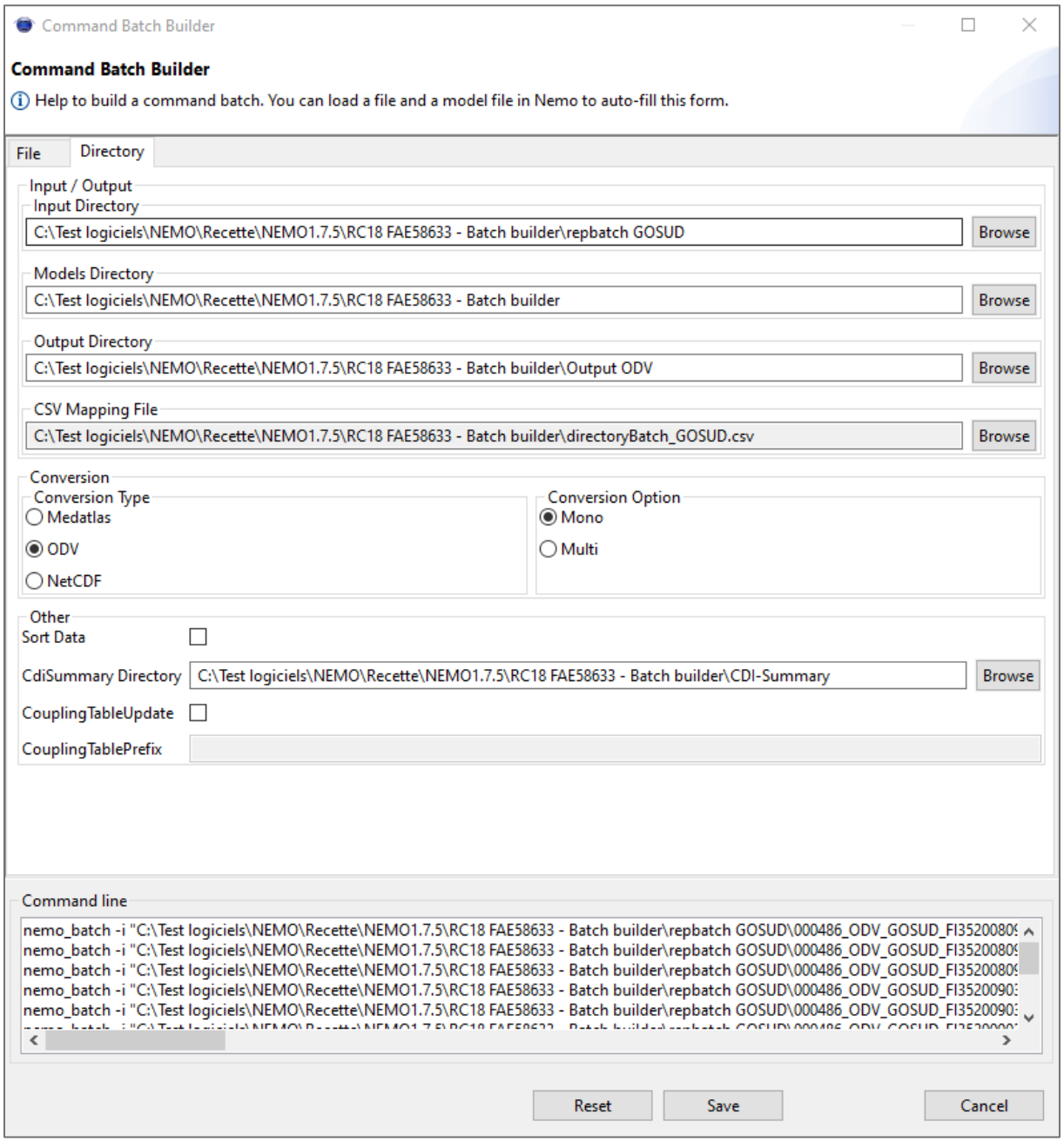


Figure 32 - Creation of a batch command for the conversion of a set of files

The following files need to be input (the mandatory fields are in bold characters):

- ***Input Directory***: path to the directory of the input files to be converted with NEMO
- ***Model Directory***: path to the directory of the models used for the conversion with NEMO
- ***Output Directory***: path to the directory of the output files of NEMO in SDN format
- ***CSV mapping file:*** path and name of the CSV file to be used for the conversion
- ***Conversion Type:*** Check the format in which the input files will be converted (must be coherent with the model declared in the mapping file)
- ***Conversion Option:*** Check Mono for conversion to mono-station files or Multi for conversion to multi-station files.
- *Sort data:* to be checked if the input data are not sorted by increasing reference parameter
- *cdiSummary*: Path to a directory for the CDI-Summary files

- *coupling Table Update*: to be checked if coupling table records have to be created
- couplingTablePrefix: with the prefix to use in the coupling table (available if – couplingTableUpdate is selected) (see §7.5.1 for explanations)

The command lines are written at the bottom of the screen as the information is being entered.

At the bottom of the screen, the 3 buttons can be used for:

- ***Reset*:** Empty all the fields on the screen
- ***Save:*** Save the batch command in a batch file (*.bat* for Windows and *.sh* for Linux), this command can then be used in batch mode.
- ***Cancel**:* Quit the Batch builder window.

8. References

[1] – Lowry R., Fichaut M., Schlitzer R., Maudire Gilbert, Bregent Sophie 2019 - SeaDataNet data transport formats. ODV, MEDATLAS, NETCDF, *SeaDataNet report, version 1.22, 69p.* *https://doi.org/10.13155/56547*

[2] Web pages for description of the MEDATLAS format *https://data.ifremer.fr/Tout-savoir-sur-les-donnees/Gestion-des-donnees/Formats/MedAtlas*

[3] – Tosello V., Fichaut M., Harscoat V., Larour M. Maudire G, 2009 – SeaDataNet, MIKADO user manual. *SeaDataNet report, version 1.1.3, 81 p.* *https://www.seadatanet.org/media/seadatanet/files/software/mikado_user_manual*

[4] – Deneudt K, De Pooter D, Gouzien S 2019 – Recommended data transport format for biological data in the framework of SeaDataNet *SeaDataNet report, version 2.1, 21 p.* *https://www.seadatanet.org/content/download/638/file/SDN2_D84b_WP8_ODV_biology_variant_format%20guidelines.pdf*

[5] Template and examples of biological data files, version 2.0, 08/02/2018 *https://www.seadatanet.org/content/download/2068/file/SeaDataNet_BioODV.zip*

[6] F. Galgani, A. Giorgetti, M. Vinci, M. Le Moigne, G. Moncoiffe, A. Brosich, E. Molina, M. Lipizer, N. Holdsworth, R. Schlitzer, G. Hanke, D. Schaap, 2019 - Proposal for gathering and managing data sets on marine micro-litter on a European scale. *EMODnet chemistry report, 07/06/2019, 34 pp.,* *https://doi.org/10.6092/8ce4e8b7-f42c-4683-9ece-c32559606dbd*

[7] Microlitter format and examples of ODV data and CDI xml metadata files *https://doi.org/10.6092/18ba5288-cea8-4af2-867f-9f4813265af2*

[8] – Lahbib S, Claus S, Oset P, Fichaut M, Thyssen M, 2019 – Ingesting, validating, long-term storage and access of Flow Cytometry data. . *SeaDataNet report, version 6, 43 p.* *https://www.seadatanet.org/content/download/3721/file/SDC_WP9_D9.13_FlowCytometryDataManagement.pdf*

[9] Flow cytometry format and examples of ODV data files and CDI xml metadata files *https://www.seadatanet.org/content/download/2101/file/TemplateandExampleODV_CDI_FlowCytoMetry.xlsx*

9. Appendix 1 – Proxy connection to the internet

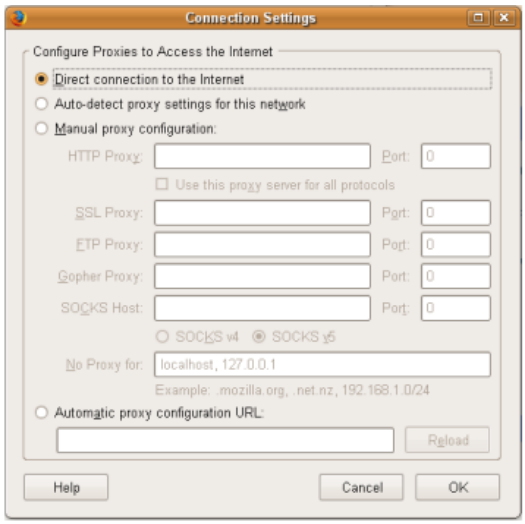
To get the proxy address and port please do as follow:

9.1. Firefox

Go into the following menus:

Tools> Options> General > Proxy > Parameters

If you have got a Proxy configuration, the address and port to add in the nemo.ini file are in the HTTP Proxy and Port fields of the following window:



9.2. Internet Explorer

Go into the following menus:

Tools, Internet Options, Connection, Local Area Network (LAN) settings

If a Proxy configuration is set, the address and port to add in the nemo.ini file are in the Proxy server Address and Port fields of the following window:

10. Appendix 2 – Writing regular expressions

1/

use "x" to represent the character "x"
use "." to represent any character including white space, digital number...

2/

use one of the following symbols to indicate the occurrence of this character:
use "?" to indicate once or not at all (ex. "a?" for search "a" once or not at all)
use "*" to indicate zero or more times (ex. "b*" for search "b" zero or more times)
use "+" to indicate one or more times (ex. "f+" for search "f" one or more times)

More about pattern possibilities:
http://download.oracle.com/javase/1.4.2/docs/api/java/util/regex/Pattern.html

Note:
=====
Nemo automatically adds ".*" at the end of the pattern, while we are searching for a string at the beginning of a line.

Example:
=========
a world beginning with "toto", ending with "zz", with one or several unknown characters in the middle (ex. "totoazertyzz")
use pattern="toto.*zz"
where "." represents any character and "*" indicates that this "any character" can occur zero or more times.

This pattern will match with the following words:
totoabcdefzzxy
totoabcdefzz
toto1234zz
totoab56zz
totoab 34 zz
totozz
totozz

This pattern will NOT match with the following words:
toabcdzz ("toto" not found)
totoabcd ("zz" not found)