

Copernicus FICE 2024

Training on

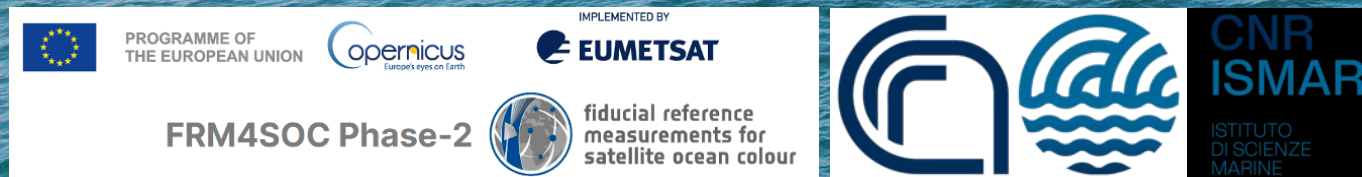
In situ Ocean Colour Above-Water Radiometry towards Satellite Validation

Demo on measurement and data handling software TriOS MSDA_XE
Focus: export data to .mlb (HyperCP compatible)

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FRM4SOC Phase-2

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fiducial reference
measurements for
satellite ocean colour

<https://frm4soc2.eumetsat.int/deliverables>

Deliverables

D-1 Project Management Plan (PMP)

D-2 Reflectance Measurement Requirements Document (RMRD)

D-3 Database to host FRMOCnet specifications, data and documentation for the OCR models as well as for individual instruments and their deployment history

D-4 FRMOCnet Database Architecture Design and User Manual document (ADUM)

D-5 OCDB Database WebUI, CLI, Python API, and Architecture Design and User Manual document

D-6 Technical Report: Measurement Procedure Document (MPROCD)

D-7 Technical Report: Complete characterisation and calibration results for FRMOCnet OCR models and re-characterisation routine: an update

D-8 Technical Report: Guidelines for individual OCR full characterisation and calibration

D-9 Data Package: FRMOCnet OCR models full characterization and calibration results

Measurement Procedure for operating the TRIOS/RAMSES radiometers to obtain Fiducial Reference Measurements (MPROC)

D6. Measurement Procedure Document (MPROCD)

Table of contents

1. Introduction
2. Measurement Equipment and pre-cruise preparations
3. Data acquisition software and pre-cruise preparations
4. Onboard installation of equipment
5. Procedure for an on-station measurement
6. Post-acquisition preparation of data for processing
7. Data processing (recommended)
8. Data processing (variants)
9. Conclusions and future perspectives
10. References
11. Appendix A – MSDA_XE screenshots

The Section 3 summarises how the MSDA_XE software is configured and prepared before a cruise and should be used in conjunction with the MSDA_XE Manuals

6. Post-acquisition preparation of data for processing

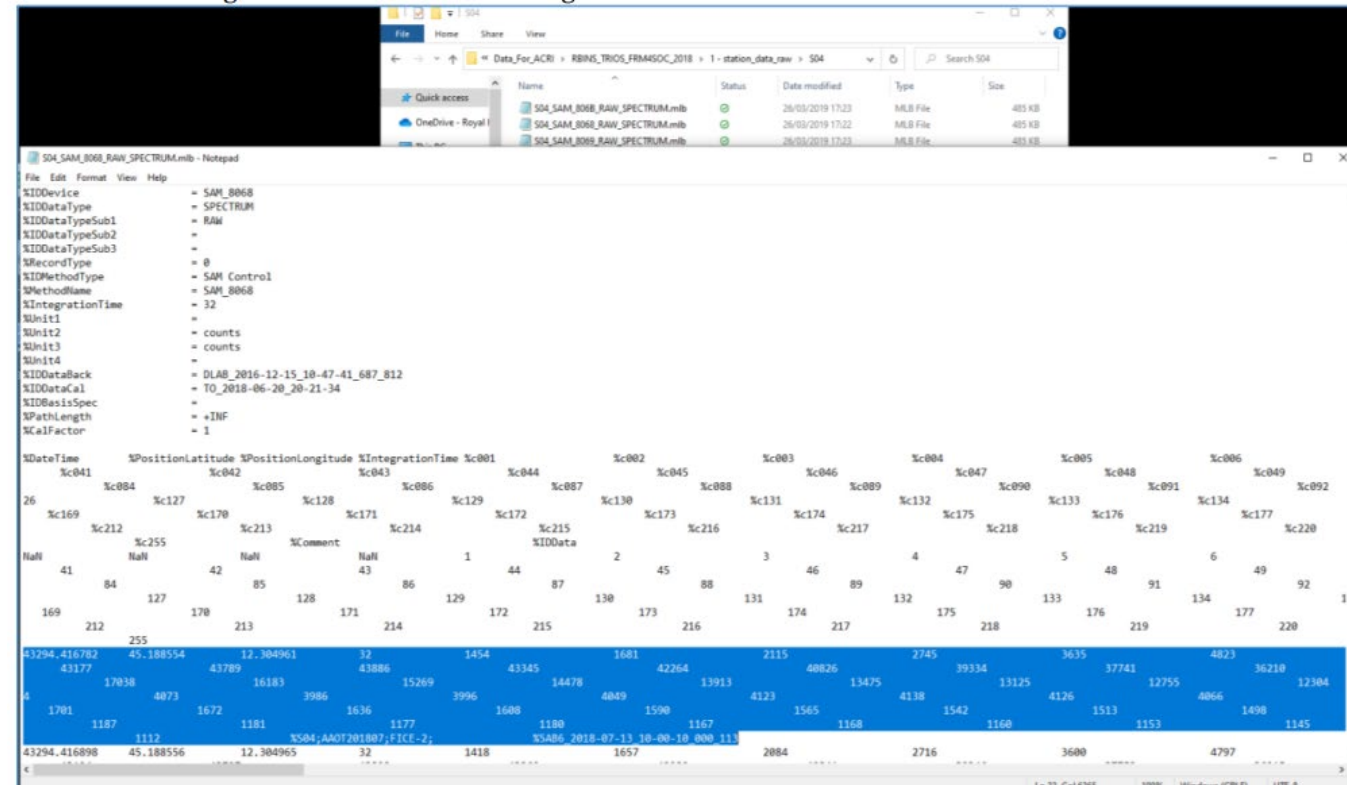
6.1 Radiometer data extraction

After the collection of data, it can be exported with MSDA_XE for HyperCP compatible format.

Extraction will give a raw data file in ASCII format and containing digital counts for each of the 3 radiometers (Ed , Ld , Lu) and for each station selected for processing.

Each data file contains

- a header of typically 18 rows
 - starting with “%” and containing instrument serial number and other metadata
- one column header row
 - starting with “%DateTime”
- and then one row of data for each acquired scan.



Each row of data contains the following (meta)data values separated by spaces:

- Datetime in Julian Day with 6 decimal places (approximately 0.1s)
- Latitude in decimal degrees North (as measured by the GPS)
- Longitude in decimal degrees East (as measured by the GPS)
- Integration Time in ms
- 255 data values as digital counts (corresponding to the 255 pixel detectors of the spectrometer, of which typically the last 18 are dark pixels used for dark correction)
- 2 training text comments each starting with “%”

- To obtain these data files, data is extracted using MSDA-XE as follows:
- EXPORT RAW files from the database (DB_Sender table obtained from Database>Data command) for each sensor separately

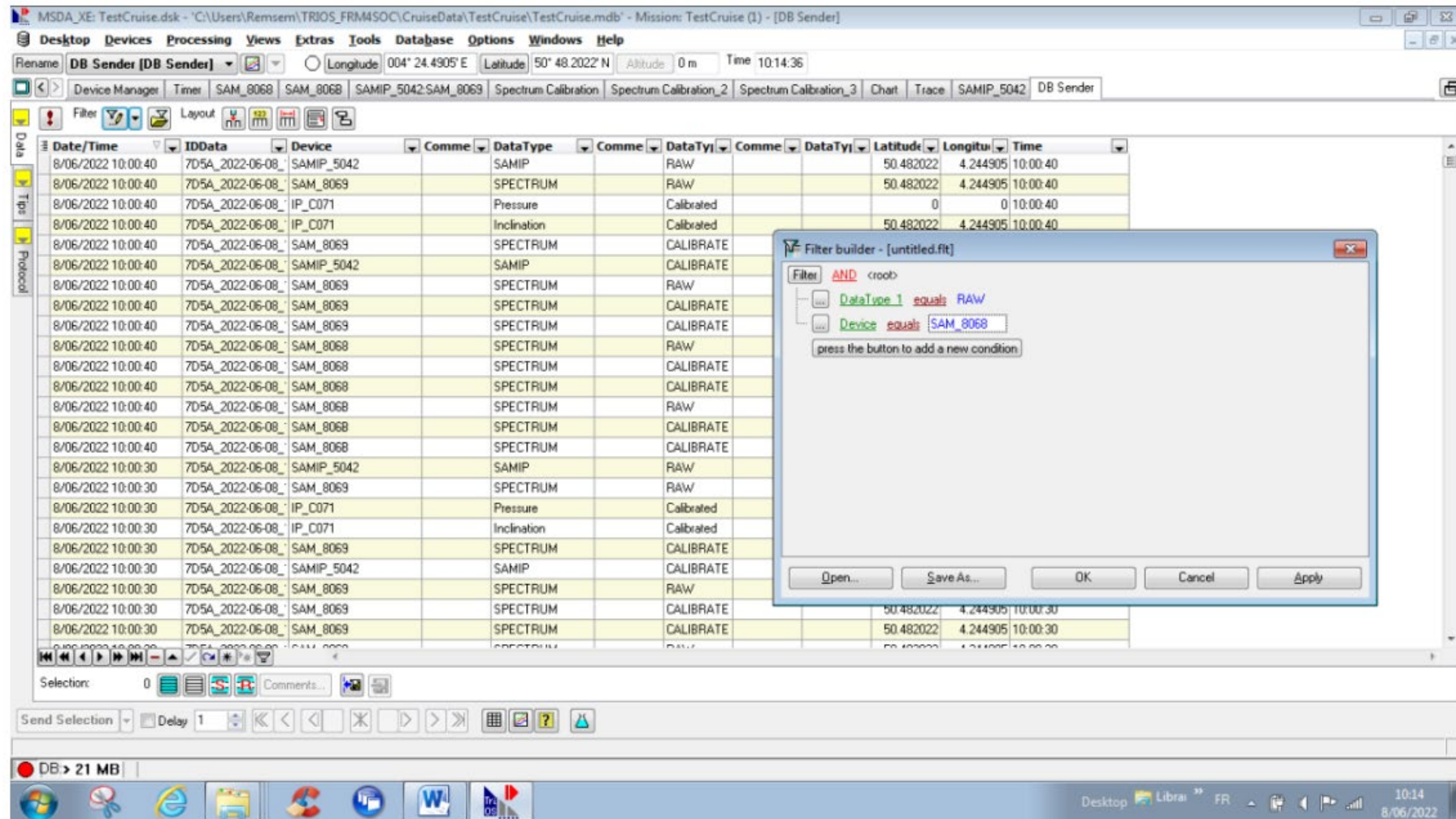


Figure 34 Screenshot preparing export of data showing data filter options for one radiometer.

1) Use the filters:

a) For the radiometers

1. Data Type_1: RAW

2. Device (select a sensor each time): SAM_8068 then SAM_806B then SAM_8069 [adapt to actual device Serial Numbers]

b) For the inclinometer use filters:

1. Device: IPc071 [adapt to actual device Serial Number]

2. DataType: Inclination

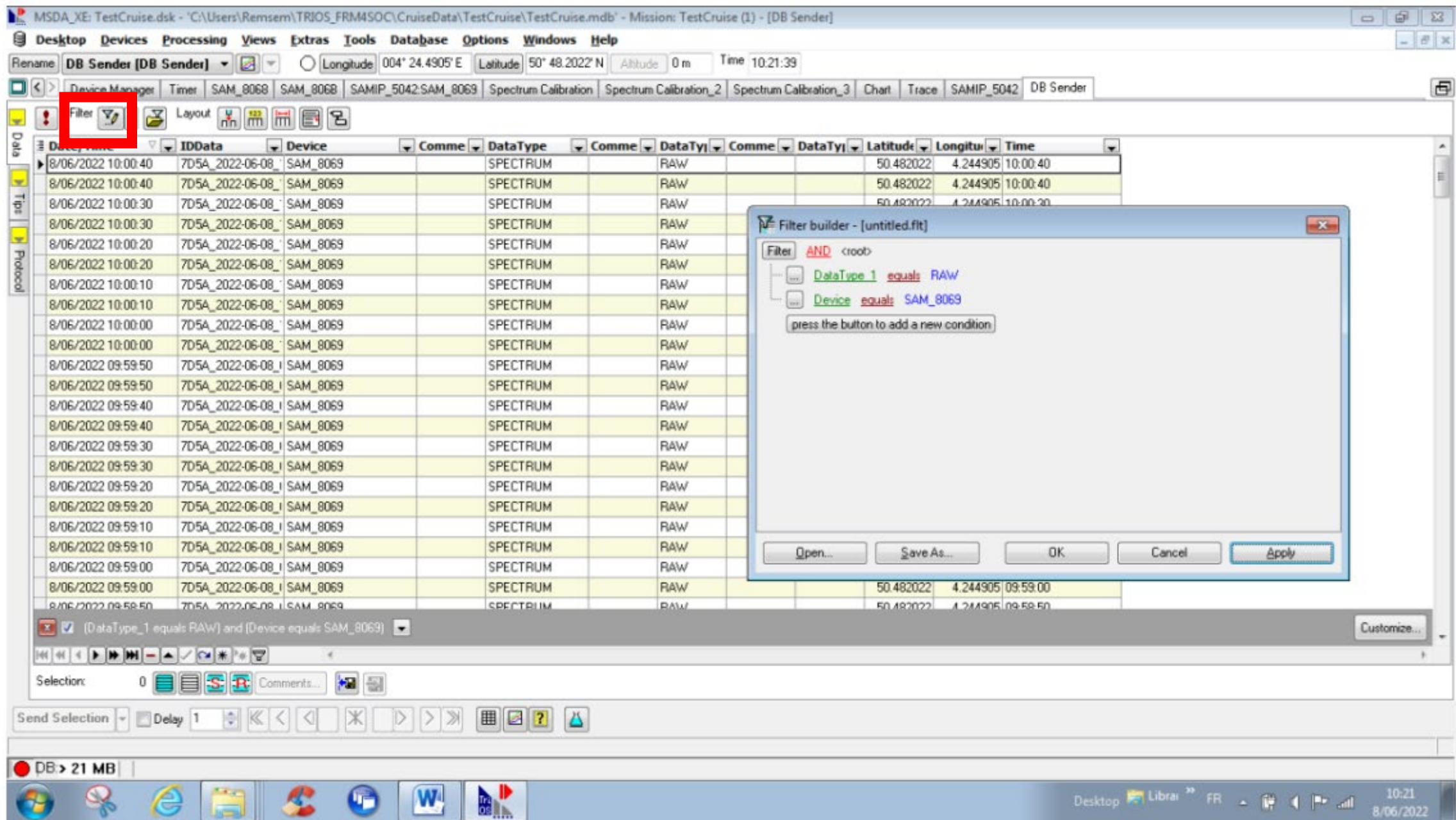


Figure 36 Screenshot preparing export of data showing data filter options for a second radiometer.

2) Select all and Export using Masks:

The screenshot displays a software application window titled "MSDA_XE: TestCruise.dsk - 'C:\Users\Remsem\TRIOS_FRMMSOC\CruiseData\TestCruise\TestCruise.mdb' - Mission: TestCruise (1) - [DB Sender]". The interface includes a menu bar (Desktop, Devices, Processing, Views, Extras, Tools, Database, Options, Windows, Help) and a toolbar with various icons. A data table is visible with columns: Date/Time, IDData, Device, Comme, DataType, Comme, DataTy, Comme, DataTy, Latitude, Longitude, and Time. The table contains multiple rows of data, all of which are highlighted in yellow. A "Filter builder - [untitled.ft]" dialog box is open over the table, showing a filter configuration: "Filter AND <root>" with two conditions: "DataType_1 equals RAW" and "Device equals SAM_8069". Below the conditions is a button that says "press the button to add a new condition". At the bottom of the dialog are buttons for "Open...", "Save As...", "OK", "Cancel", and "Apply". In the main application window, the "Selection:" area shows "0" and a "Comments..." button, both of which are highlighted with red boxes. The status bar at the bottom indicates "DB > 21 MB" and the system tray shows the date and time as "10:21 8/06/2022".

Figure 36 Screenshot preparing export of data showing data filter options for a second radiometer.

Tab: Matlab Serial Data

Sub-tab (left): Masks

Directory: C:\Users\MyUserName\TRIOS\CruiseData\ThisCruise\

Mask: \${Comment0}_\${IDDevice}_\${DataType1}_\${DataType}

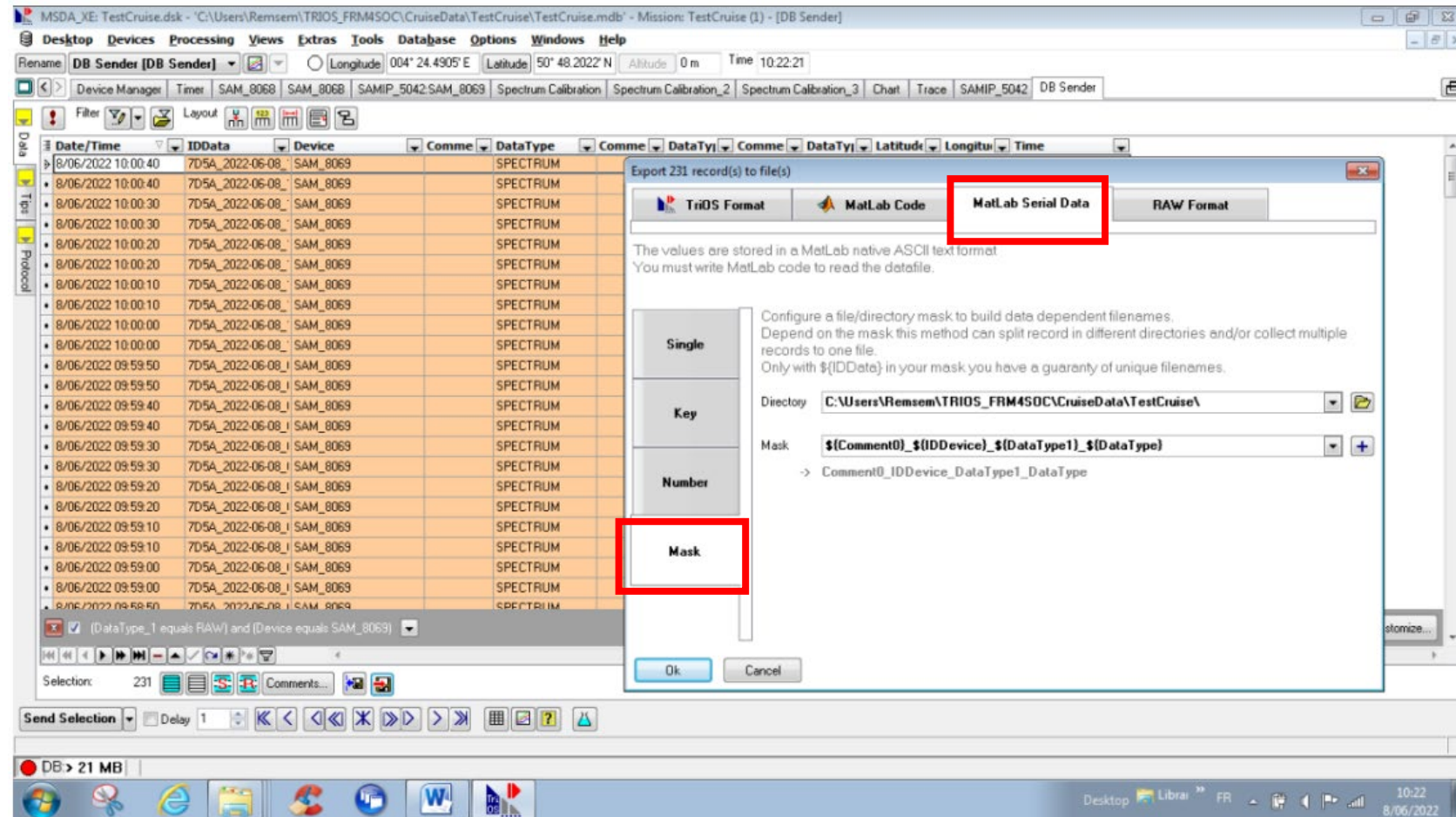


Figure 37 Screenshot while exporting data from one radiometer – showing output filename setting.










- In this way for each sensor one file for each station is created.
- Example:

StationName_SAM_8068_RAW_SPECTRUM.mlb

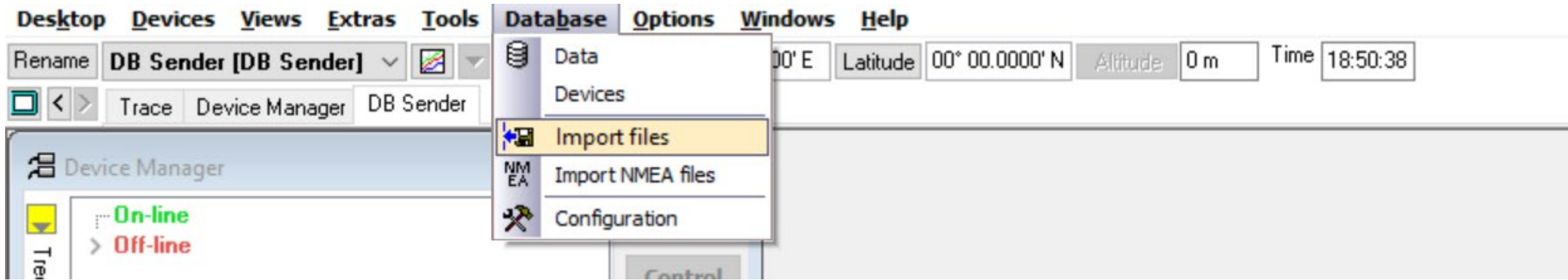
StationName_SAM_806B_RAW_SPECTRUM.mlb

StationName_SAM_8069_RAW_SPECTRUM.mlb

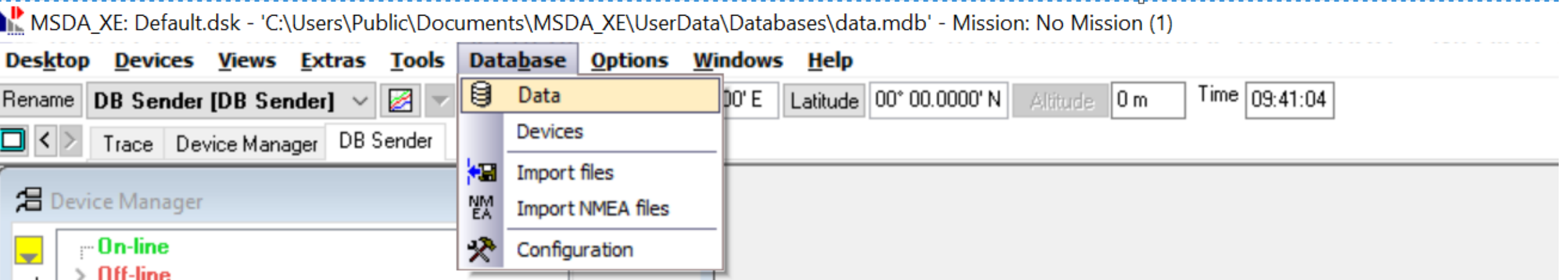
- Hands-on exercise to export TriOS RAMSES data to .mlb (HyperCP compatible) with MSDA_XE software.
- Input data from the Baltic Sea (8th July 2023, GMT 7:03 – 7:09:50, every 10 s)
 - SAM_8166 – *Ld*
 - SAM_8595 – *Lu*
 - SAM_8329 – *Ed*

Name	Date modified	Type	Size
 SAM_8166_Spectrum_RAW_2023-07-08_07-01-...	08.07.2023 07:02	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-02-...	08.07.2023 07:02	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-02-...	08.07.2023 07:02	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-03-...	08.07.2023 07:03	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-03-...	08.07.2023 07:03	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-03-...	08.07.2023 07:03	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-03-...	08.07.2023 07:03	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-03-...	08.07.2023 07:03	DAT File	5 KB
 SAM_8166_Spectrum_RAW_2023-07-08_07-03-...	08.07.2023 07:03	DAT File	5 KB

- Import test dataset:
 - Database → Import files



- Open the dataset



- Use **Filter** to specify the **Device** and export data for all three sensors separately

The screenshot shows the DB Sender_2 application interface. The main window displays a table of data with columns: Date/Time, IDData, Device, Comme, DataType, and Li. The data rows show timestamps from 08.07.2023 07:07:20 to 08.07.2023 07:10:00, all with Device 'SAM_8329' and DataType 'SPECTRUM'. A 'Filter builder - [untitled.ftt]' dialog is open in the foreground, showing a filter rule: 'Device equals SAM_8329'. The dialog also includes a 'Filter' dropdown set to 'AND <root>' and a button to 'press the button to add a new condition'. At the bottom of the main window, a status bar shows '(Device equals SAM_8329)' with a dropdown arrow.

Date/Time	IDData	Device	Comme	DataType	Comme	DataTy	Comme	DataTy	Li
08.07.2023 07:10:00	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:09:50	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:09:40	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:09:30	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:09:20	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:09:10	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:09:00	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:08:50	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:08:40	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:08:30	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:08:20	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:08:10	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:08:00	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:07:50	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:07:40	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:07:30	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			
08.07.2023 07:07:20	OC1E_2023-07-08_	SAM_8329	FRM4SOC2	SPECTRUM		RAW			

- Under **MatLab Serial Data**, choose **Mask** tab
 - Specify the output Directory
 - Add Mask

- Repeat it for two other sensors

