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ADCP Workhose Mariner 600 kHz
on RV “MYA 2”

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Contents

1 ADCP Installation Overview

1.1 Sensor Equipment

The following sensors are installed on the RV “MYA 2”:

Table 1: Sensor specification

Sensor	Model	Details from Manufacturer
ADCP	Teledyne RDI Workhorse Mariner 600 kHz	Range: 50 m Vertical resolution cell size: 0.25-8 m Velocity accuracy: ±0.3%of water velocity Number of depth cells: 1-128 Ping rate: 2Hz
Inertial Navigation System	Coda Octopus F180	Positional Accuracy: 0.2 m with L1 RTK correction; 0.4 m with DGPS Roll, Pitch accuracy: 0.025° Heave accuracy: 5 cm or 5% Velocity accuracy: 0.014 m/s

1.2 Sensor Structure

Figure 1 shows the sensor structure of the ADCP hardware and Figure 2 shows the installation in the laboratory. The ADCP is hull mounted and the deck unit is permanently installed in the server rack. The operator PC receives ADCP data from one ADCP deck unit at a time, position information as well as attitude data (heading) from the Coda Octopus F180 Inertial navigation system (INS).

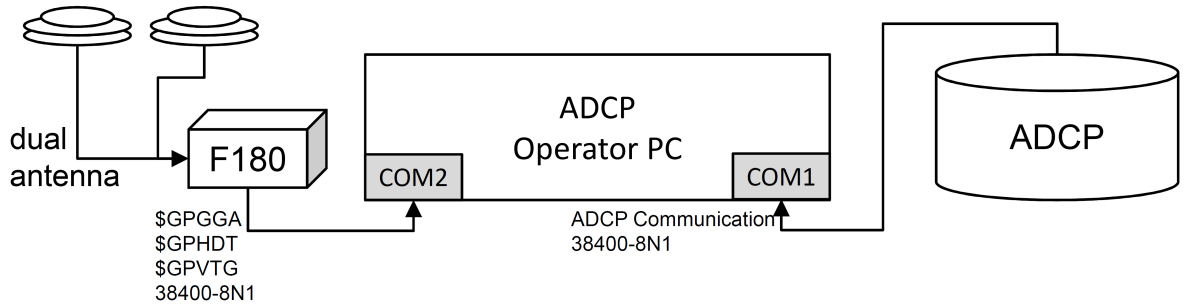
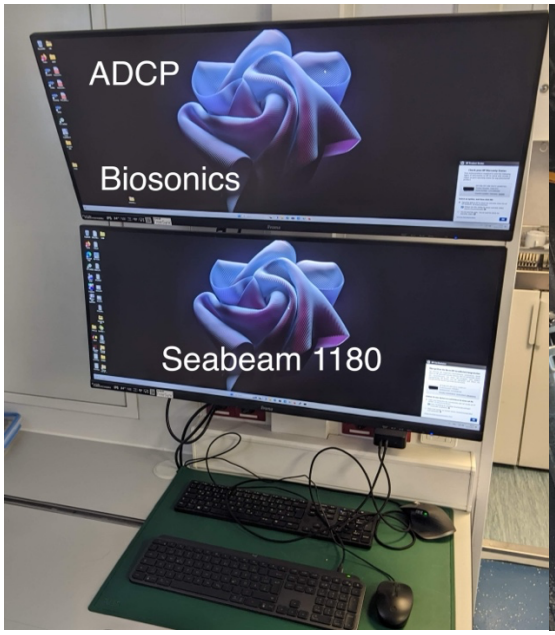
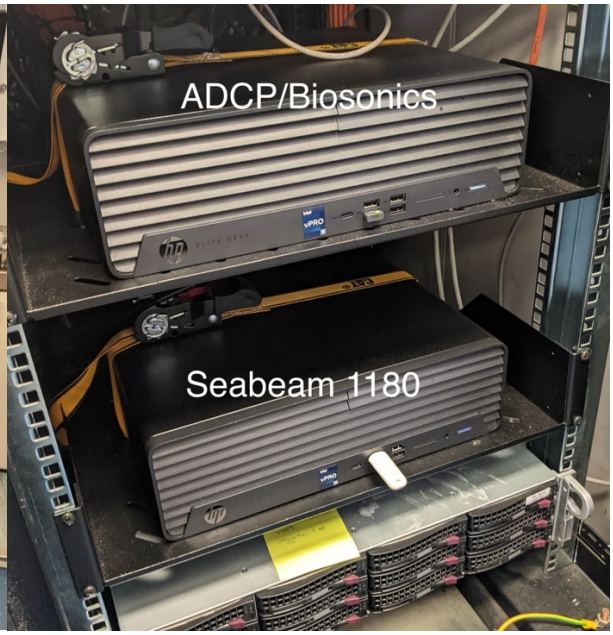


Figure 1: Sensor dependencies





1.3 Software

The software *VmDas* (Vessel-mount data acquisition system) is used for data acquisition and configuration of the ADCP. The software *WinADCP* can be used for visualization and export of recorded raw data. Both software packages are installed on the ADCP operator PC.

2 System Start-up

This manual is construed for the specific use of the ADCP on RV “MYA 2” and focuses on the most important parameters to be looked after during data acquisition. We recommend to additionally read the ***VmDas Quick Start Guide*** and ***VmDas User Guide***.

2.1 Switch on ADCP

1. Power up the ADCP operator PC (Figure 2, right)
2. Power up the deck unit in the server rack (Figure 2, right)

2.2 System Test (BBTalk)

Before you start a survey you should perform a hardware system test.

1. Start the BBTalk program from the desktop of the operator PC.
2. Connect to the ADCP unit by selecting the settings as shown in Figure 3.

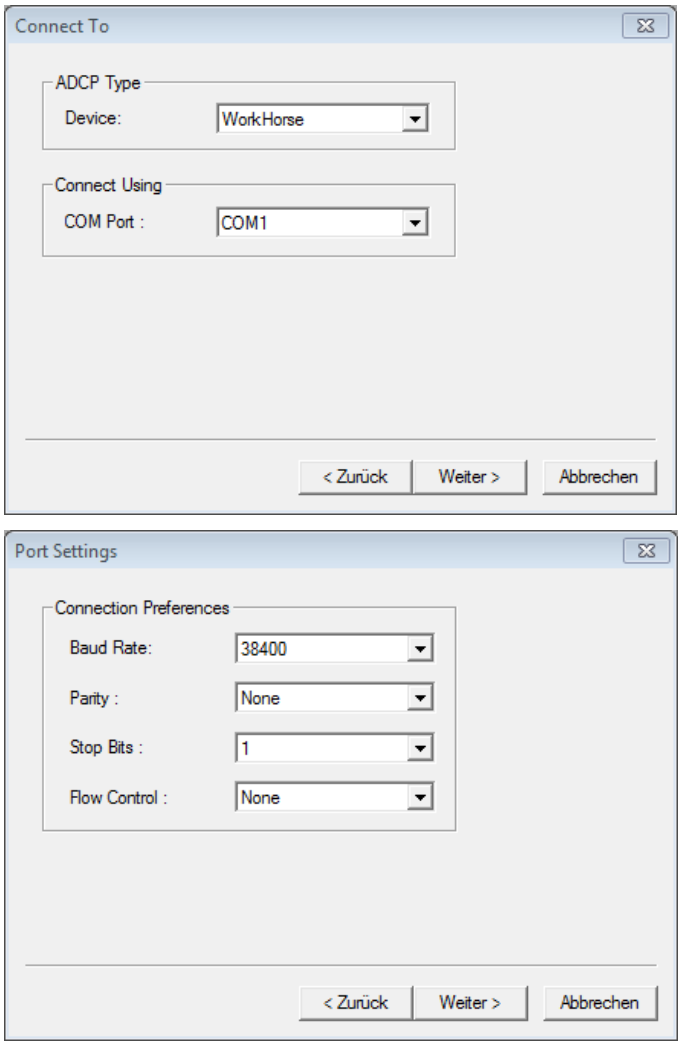


Figure 3: Serial connection settings in BBTalk

3. Choose menu ***File*** → ***Options*** and select settings as shown in Figure 4.

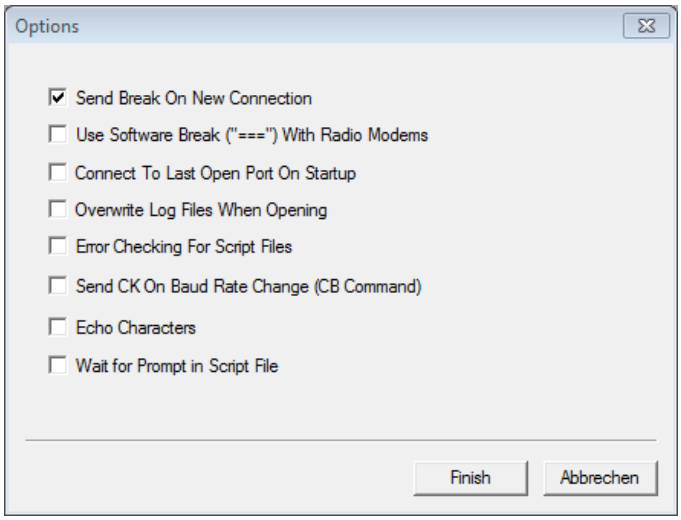


Figure 4: Program settings in BBTalk

4. To run the tests several commands need to be sent to the ADCP.
   Select the menu ***File*** → ***Send script file*** or press <F2>.
   Select the file C:\Program Files (x86)\RD Instruments\RDI Tools\TestWH.rds.
   This file contains a set of commands for the ADCP which is now executed one after another:
   CR1, TS?, PS0, PT8, PT9, PT3, PT6.
   The results are saved to a *.txt file in the folder C:\ Program Files (x86)\RD Instruments\RDI Tools\.

3 VmDas Acquisition Software

The software VmDas is used for data acquisition and playback.

1. Start the VmDas program from the desktop of the operator PC
2. If you run VmDas for the first time you should follow the next chapters to **check the configuration settings!** Enter the menu ***Options*** → ***Edit Data Options*** for editing the settings described in the following chapters.
3. After checking the settings carefully **start the data acquisition**. Select the menu ***File*** → ***Collect Data*** or press the button at the upper left of the main window. The data recording starts immediately and the screen looks about the same as the screenshot in Figure 5.

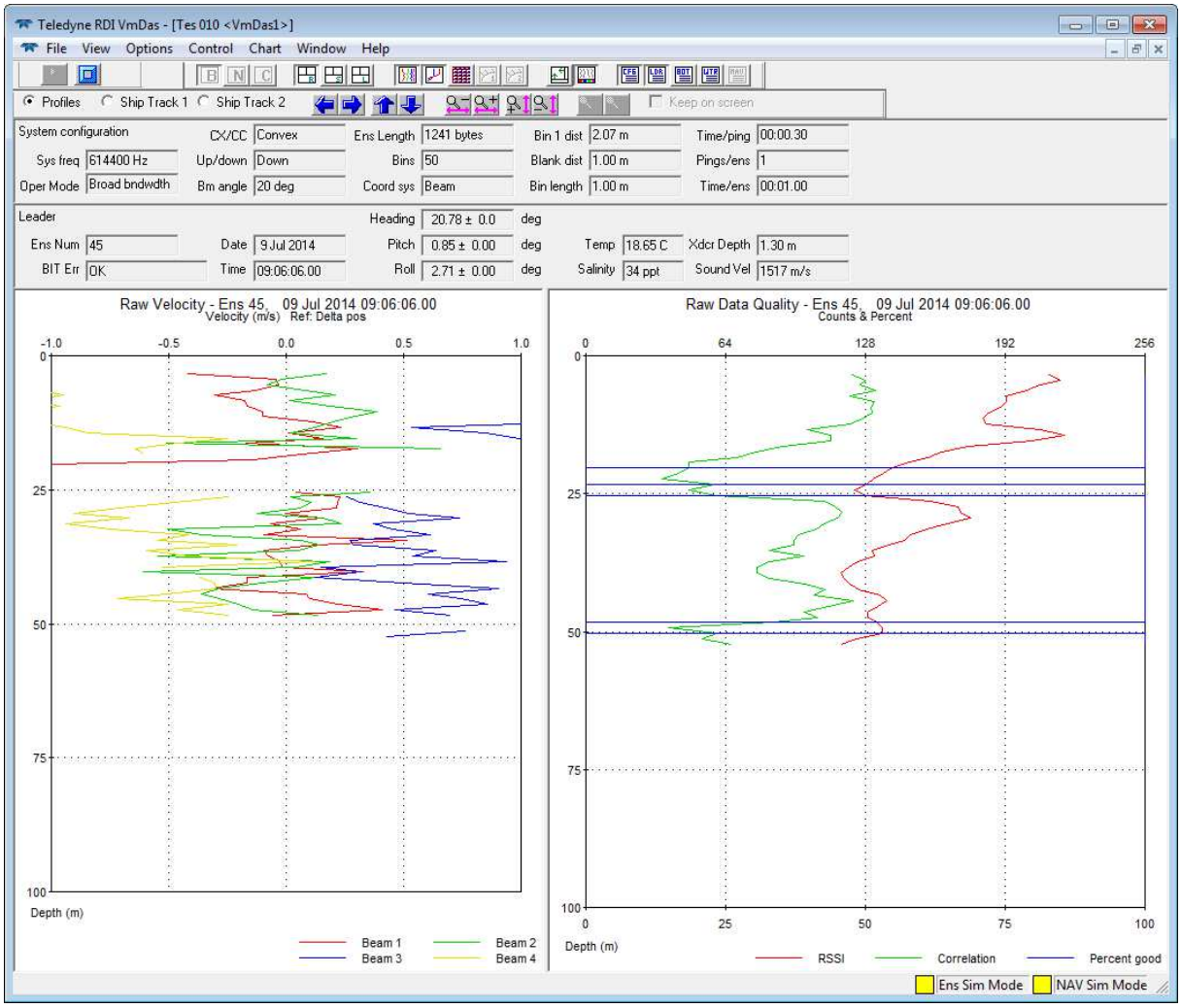


Figure 5: VmDas screen layout during data collection (raw display mode)

3.1 Communications Settings

The Communications tab (in menu ***Options*** → ***Edit Data Options***) configures the serial or network connections to the ADCP and the navigation and heading sensor (F180). Ensure that the settings for the two COM ports are as shown in Figure 6 (red circle). If not, select the ADCP and NMEA1 input on the left and apply the correct settings in the bottom part.

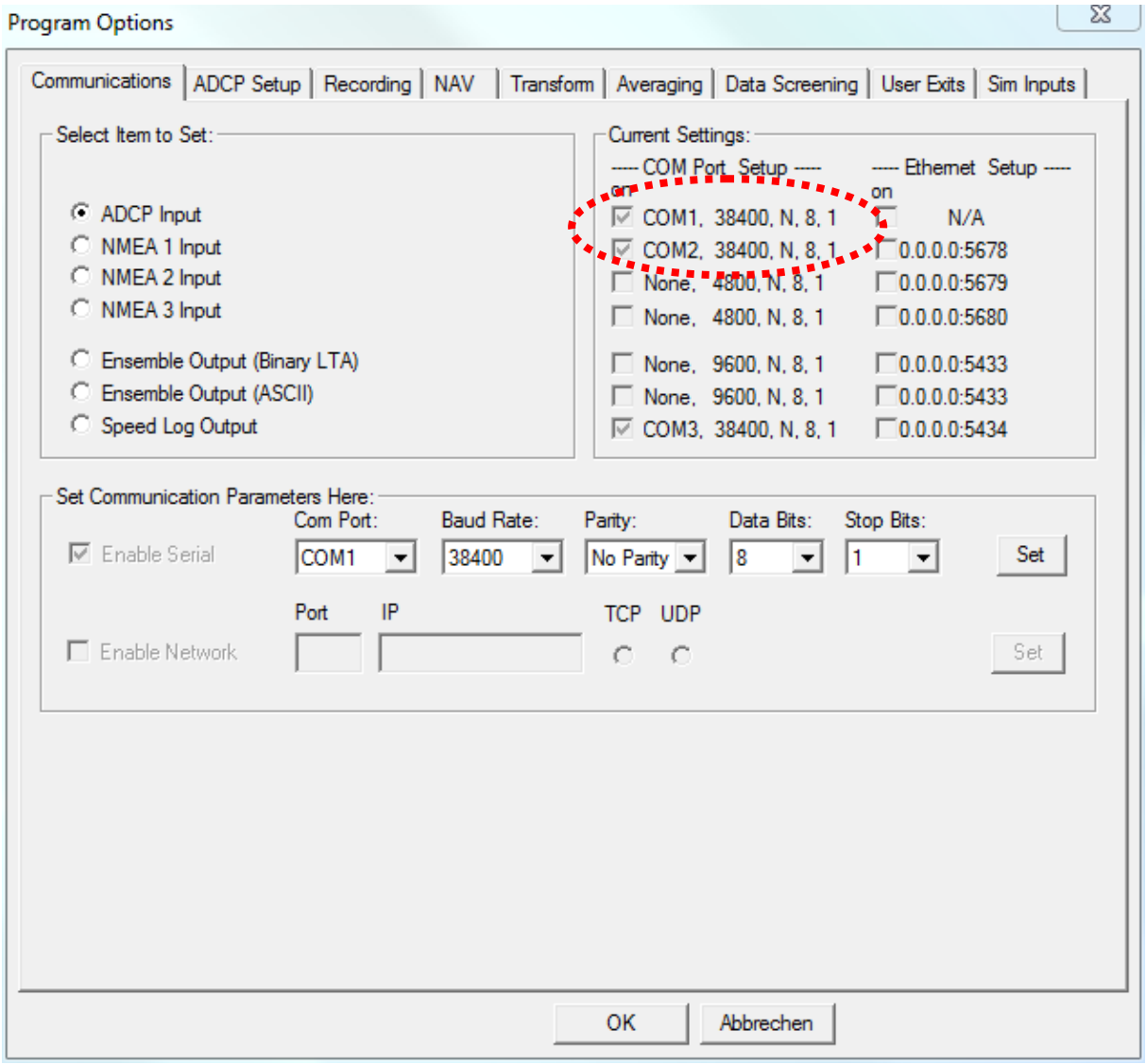


Figure 6: Required communication settings (red circle)

3.2 ADCP Settings

The ADCP Setup tab (in menu ***Options*** → ***Edit Data Options***) configures the ADCP operation and auxiliary sensors (Figure 7). It is recommended to use the prepared setting files ***WH600DEF_fine_res.txt*** for finer resolution (128 bins, 0.5 m bin size and 0.5 m blanking distance), or the file ***WH600DEF_new.txt*** for a coarser resolution (50 bin, 1 m bin

size, 1 m blanking distance). Both files are located in ***C:\Program Files (x86)\RD Instruments\VmDas***. If bottom tracking is activated (default setting and recommended), the ***Ensemble Time*** should be set to "***Ping as fast as possible***".

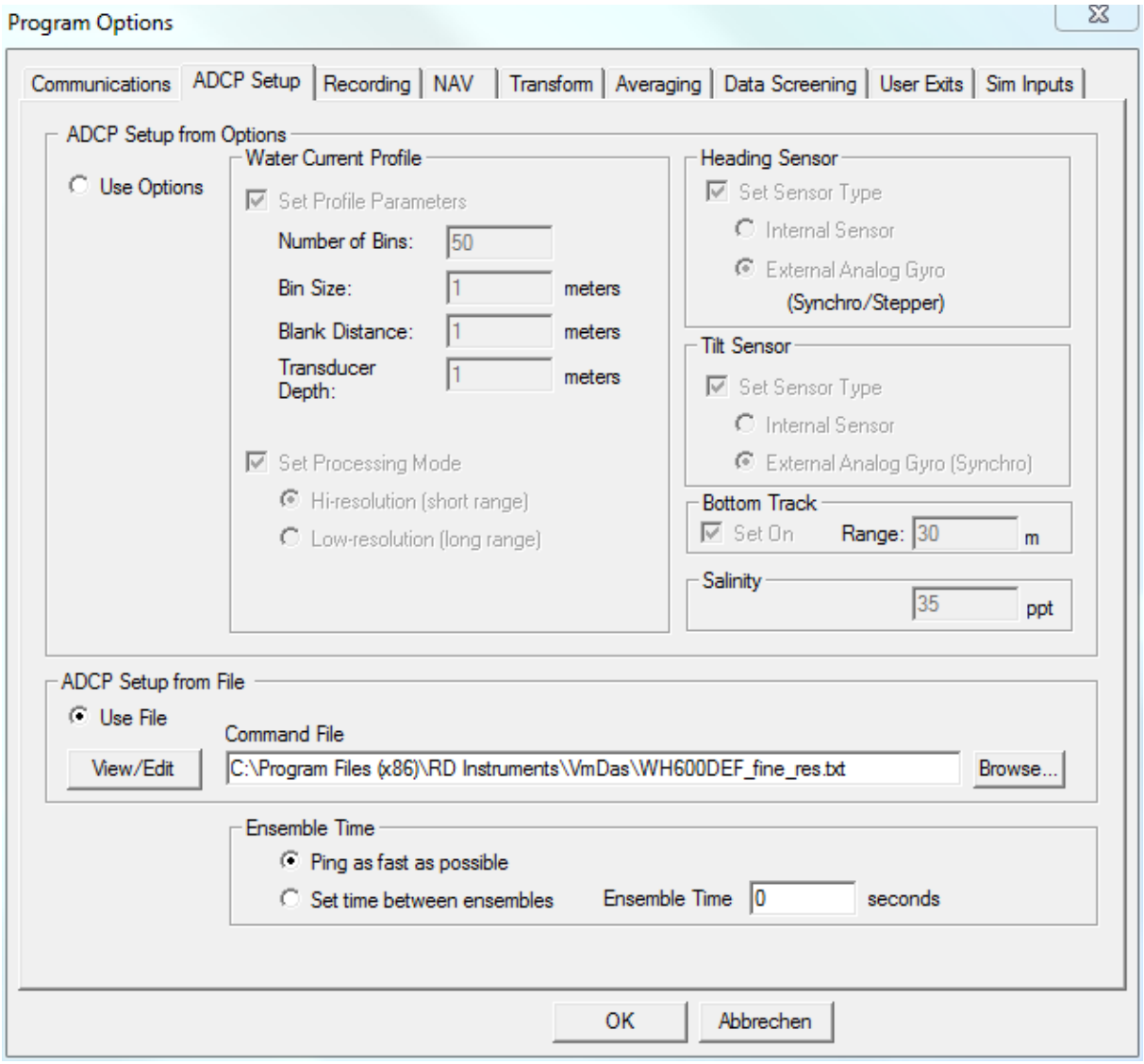


Figure 7: ADCP and auxiliary sensor setup

3.3 Recording Settings

The Recording tab (in menu ***Options → Edit Data Options***) configures the recording options for your survey/expedition. Choose an adequate name for your survey/expedition. Set the primary path for recorded files to ***C:\ADCP Data*** as shown in Figure 8. If a backup is desired, check ***Dual Output Directories*** and provide a path (***C:\RDI\ADCP***).

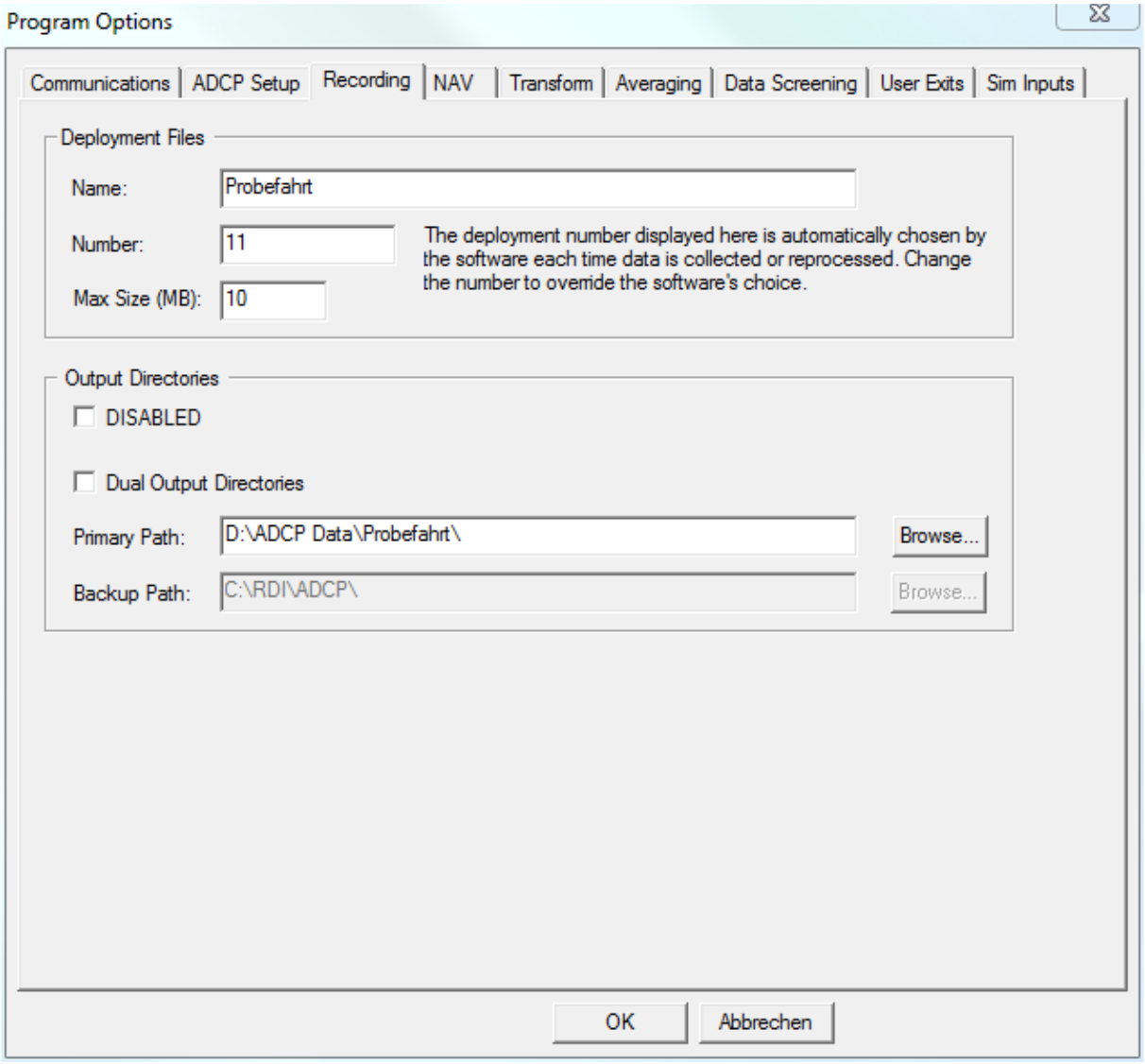


Figure 8: Recording settings; make sure to set correct output and backup directories.

3.4 Navigation Settings

This tab configures the navigation input sources for the ship's position and the ship's speed over ground. Ensure the settings are as shown in Figure 9.

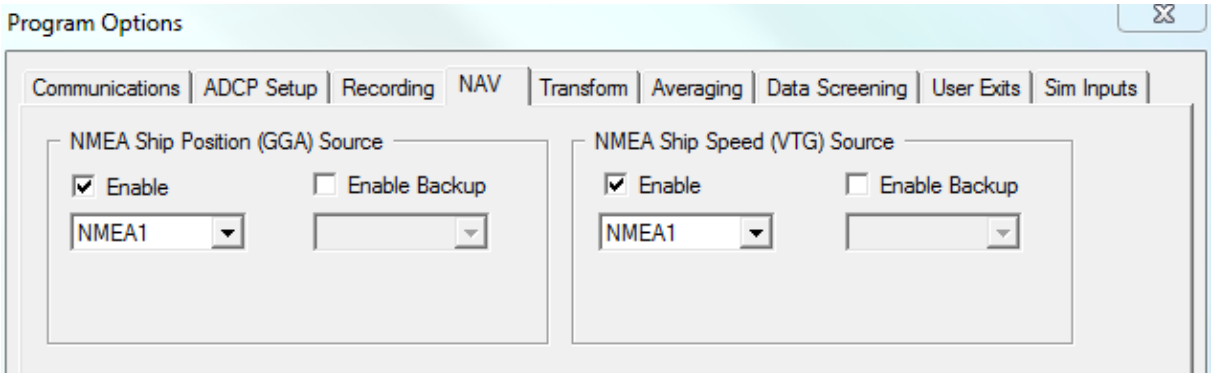


Figure 9: Required navigation input settings

3.5 Transformation Settings

The Transform tab configures heading and roll/pitch input sources as well as angular offsets for each parameter. Please ensure all settings are as shown in Figure 10.

The ADCP is mounted -2.67° relative to the ship's longitudinal axis (bow-stern) which has been detected by a bottom and water track measurement. Ensure this offset is given as the EA Heading Alignment Error in the configuration!

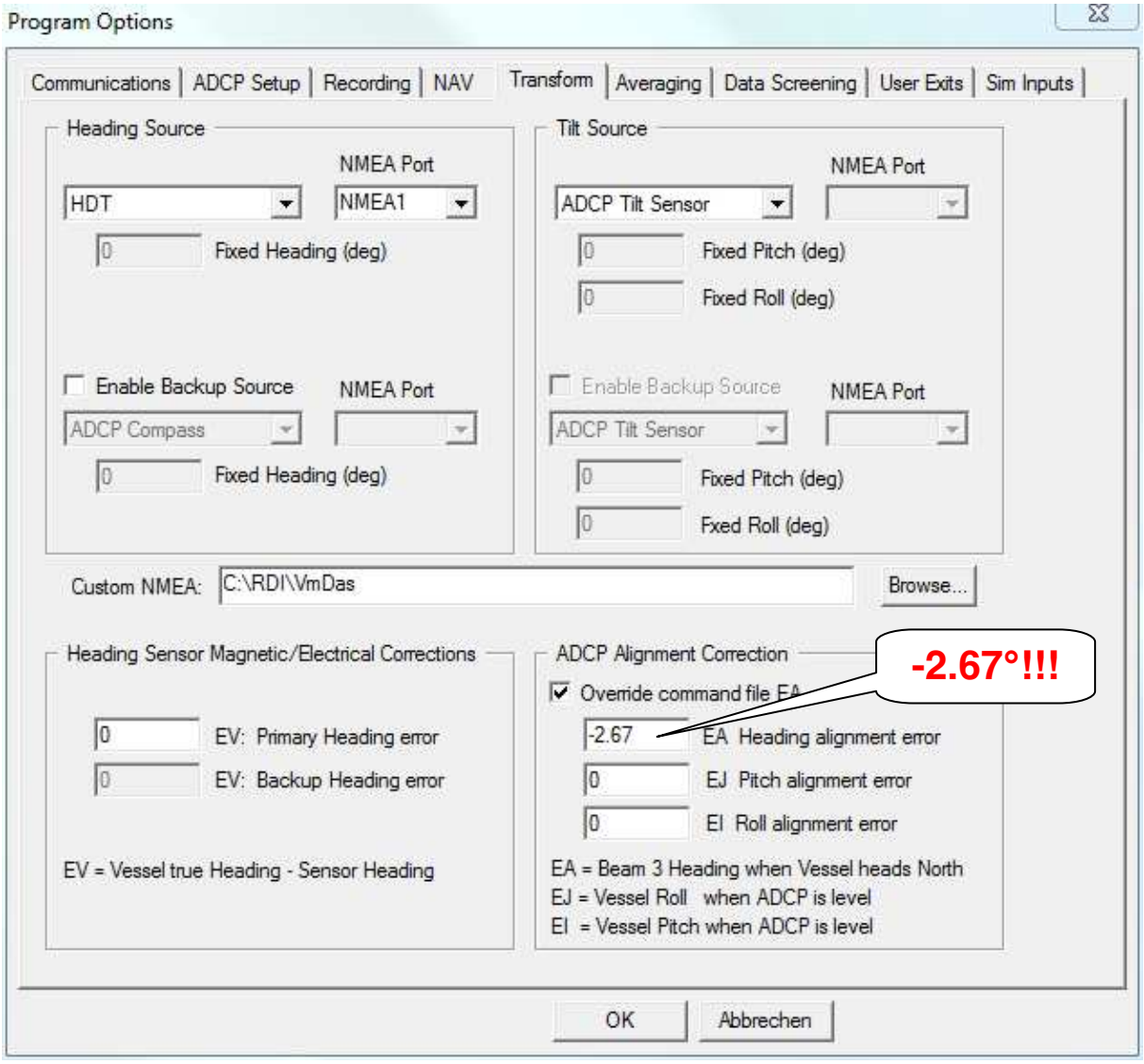


Figure 10: Required transformation settings

3.6 Averaging Settings

This tab (in menu ***Options*** → ***Edit Data Options***) configures the averaging of the ADCP raw data. Configure as shown in Figure 11 or adjust the settings according to your requirements. The settings will not affect the raw data.

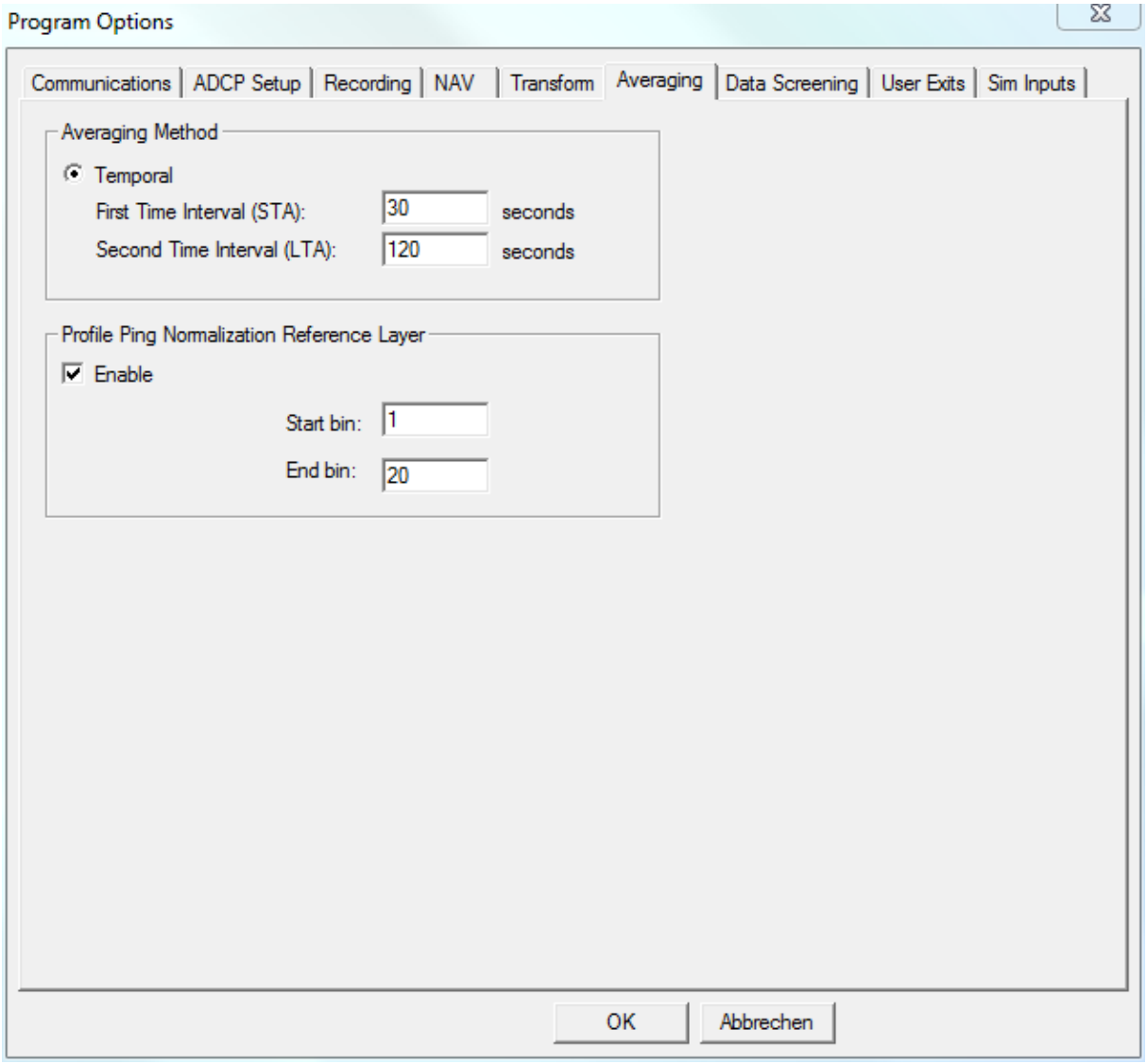


Figure 11: Averaging settings, adjustable to your requirements

3.7 Data Screening Settings

The Data Screening tab (in menu ***Options*** → ***Edit Data Options***) configures the screening settings for the visualization of the ADCP raw data. Adjust these settings according to your requirements.

You can set limits for RSSI (amplitude), correlation, percent good, error velocity, vertical velocity and fish screening. If the raw values are below the selected minimum limits the values will not be displayed nor included in the short time and long time averages. The raw data is of course not affected by these settings.

3.8 Short Term Averages (STA) in VmDas

VmDas offers the possibility to display already averaged velocities (according to the averaging settings, Figure 11) on a map including the ship movement on a map (screenshot

in Figure 12). Therefore, press the tab  in the toolbar. You can change the references / displayed velocities under ***Options → Edit Display Option*** (this will not affect the raw data collection).

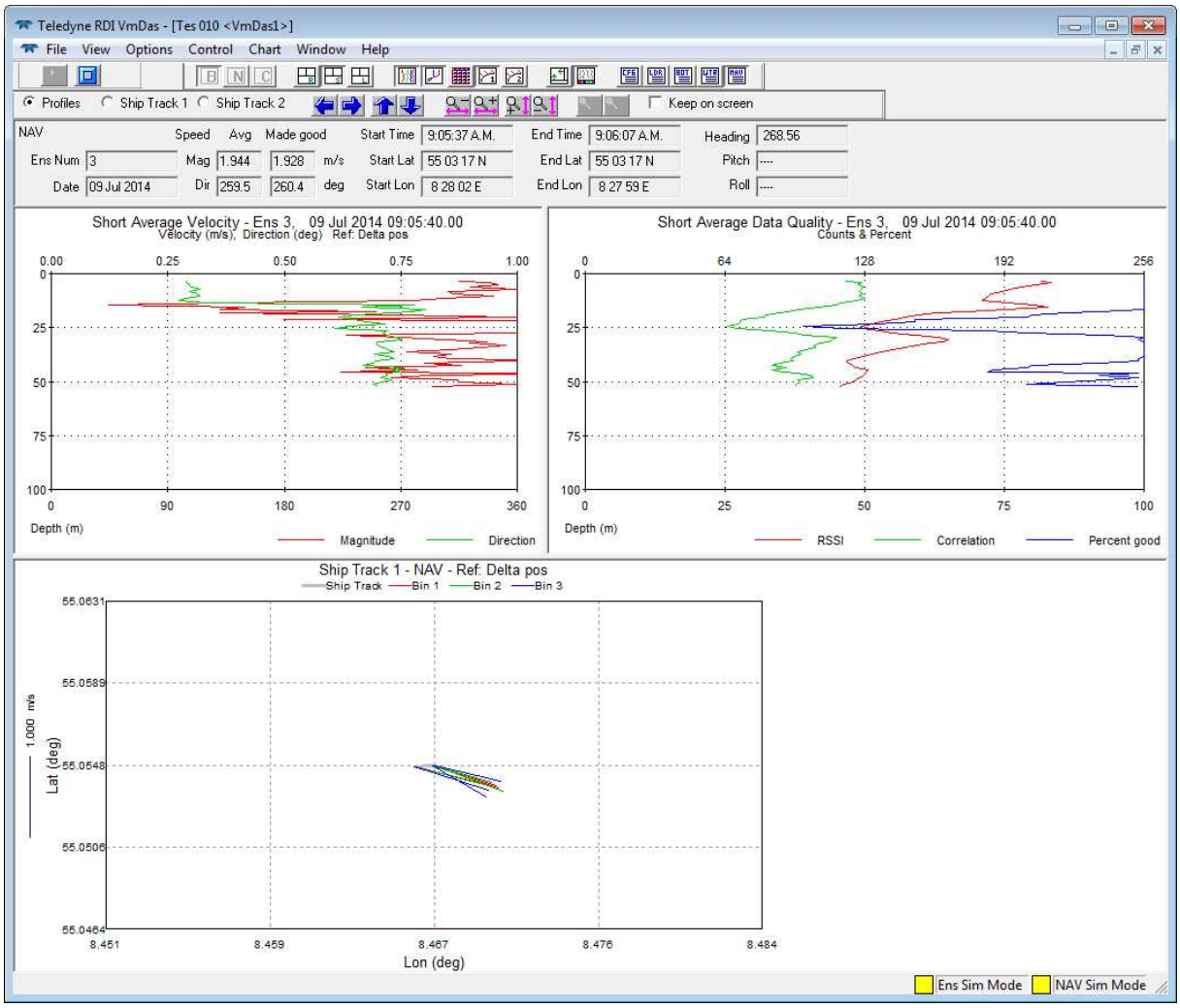


Figure 12: Screenshot of WinADCP during data replay

4 WinADCP

The WinADCP software can be used for visualization and export of the recorded ADCP data (screenshot in Figure 13). For a detailed description, please read the ***WinADCP User Manual*** for help on how to use the software.

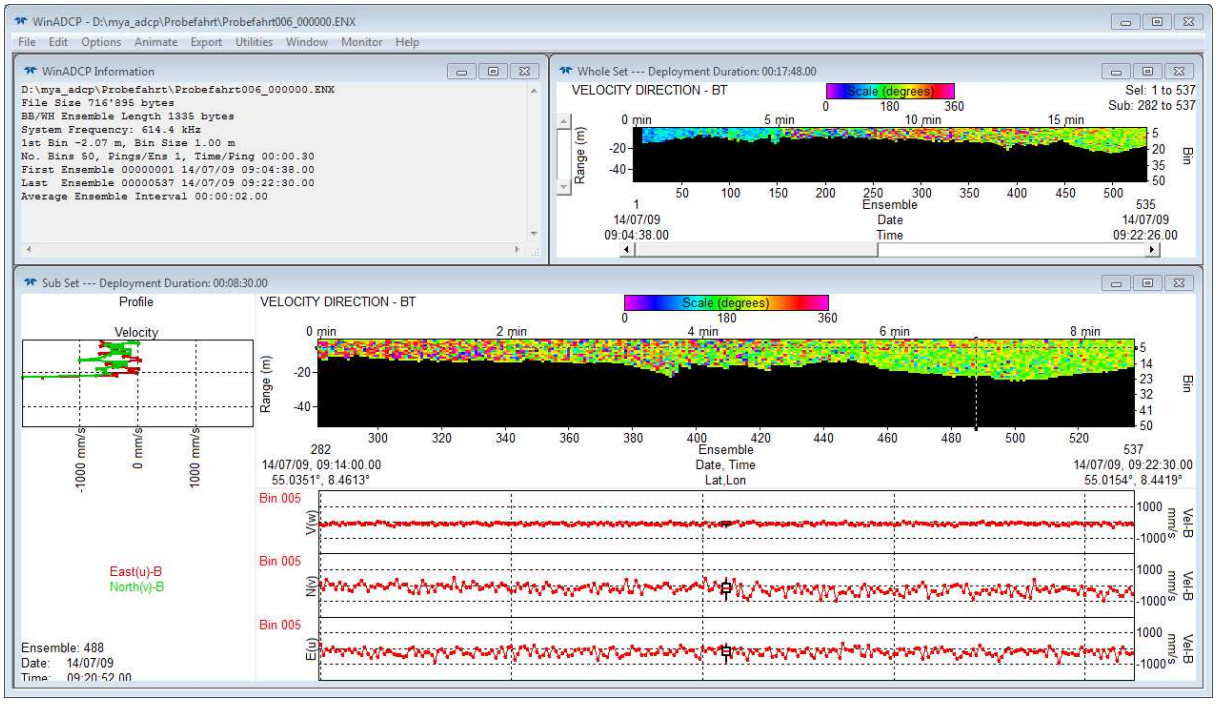


Figure 13: Screenshot of WinADCP during data replay

4.1 Exporting Data

Besides several displaying and replay features of the collected data, WinADCP is used to Export the data to ASCII-format. This is done using ***Export*** and then choosing ***Series/Ancillary***. Here, a selection can be made which bins should be exported and which primary data types (typically the zonal, meridional and vertical velocities) and which ancillary data types should be exported (typically Lat/Lon). If bottom track is chosen as velocity reference, the exported velocities are already representing the true water velocities (i.e. ship movement corrected).

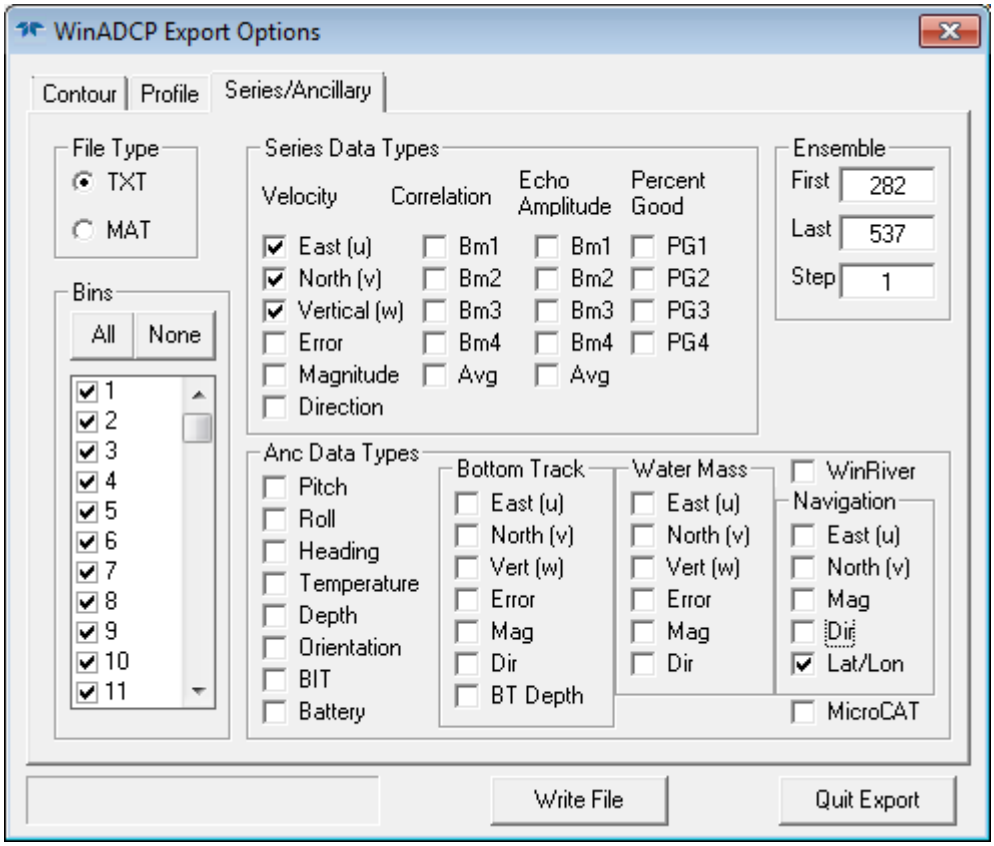


Figure 14: Data export in WinADCP