

Table of Contents

1. Introduction.....	1
2. User interface overview	1
2.1. General	1
2.2. Sensors	6
2.3. 3D visualization.....	9
2.4. Application settings	11

1. Introduction

The Vessel Editor application is designed to create and modify survey vessel definitions, as well as provide 3D visualization of the survey vessel. The vessel definition contains basic physical dimensions of the vessel, a collection of sensors, either mounted rigidly on the vessel's hull, or towed underwater by cables, and the set of appearance settings controlling vessel display in SonarWiz 5.

2. User interface overview

2.1. General

Upon starting the application in standalone mode from the Start menu, the following interface will show up:

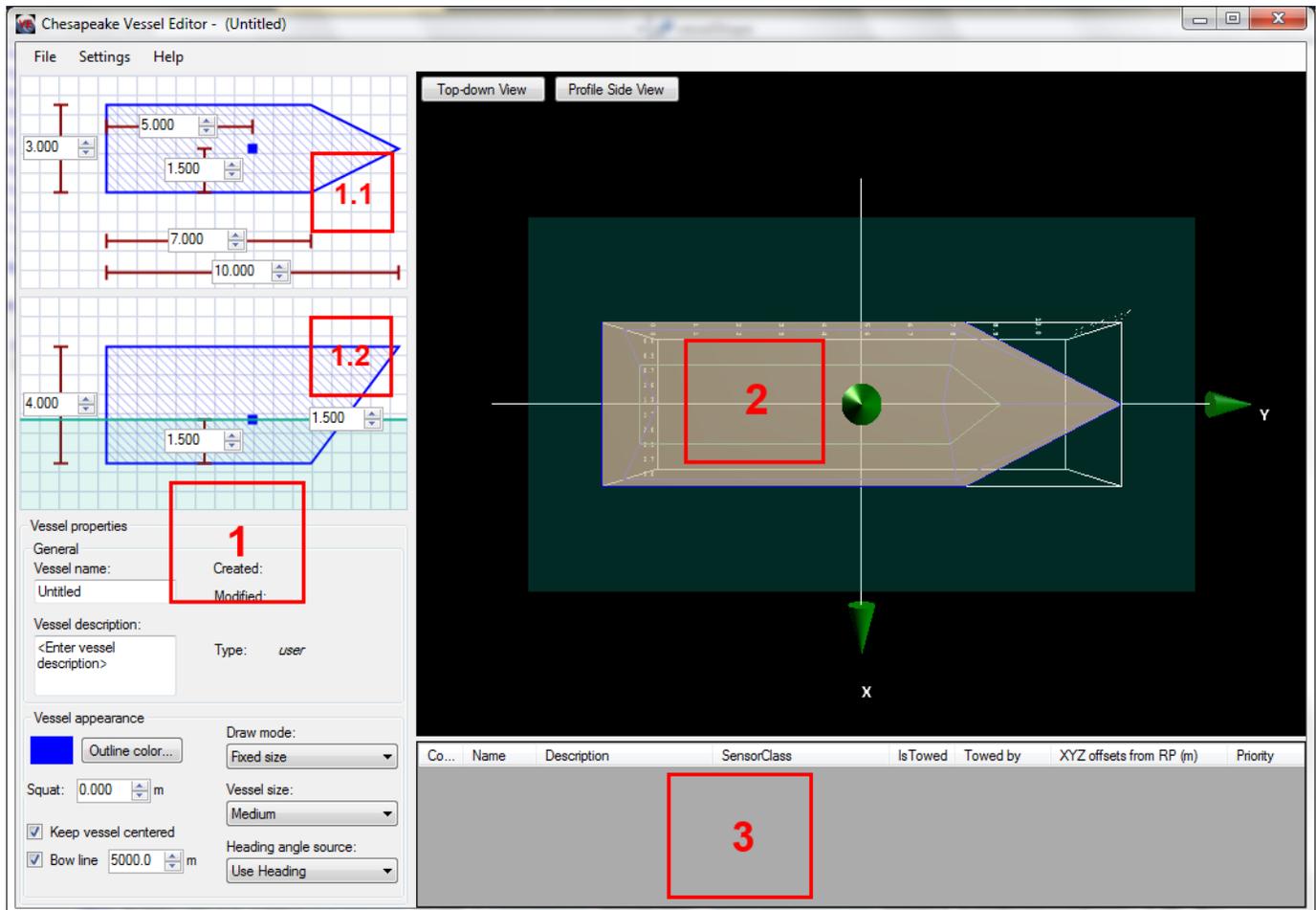


Illustration 1: Vessel Editor interface. It contains following sections:

1. Vessel property manager used to enter vessel name, description, physical dimensions, reference point and display options.
 - 1.1. Vessel top-down plan view.
 - 1.2. Vessel profile view.
2. Vessel 3D view.
3. Sensor list.

Vessel properties are entered in property manager located on the left side of the screen (1). Vessel dimensions and reference point position are entered on plan (1.1) and profile (1.2) views, in the upper portion of vessel property manager (1).

On the plan view vessel length and width, as well as bow break distance and X/Y coordinates of reference position (RP) (e.g. the position of your GPS antenna) can be entered:

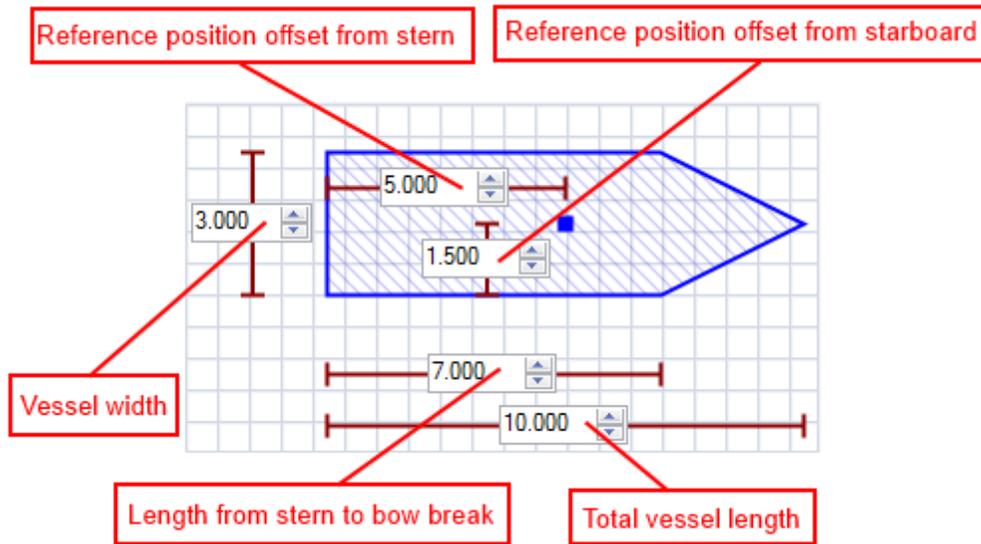


Illustration 2: Vessel plan view

On the profile view, vessel height, waterline offset and Z coordinate of reference position can be entered:

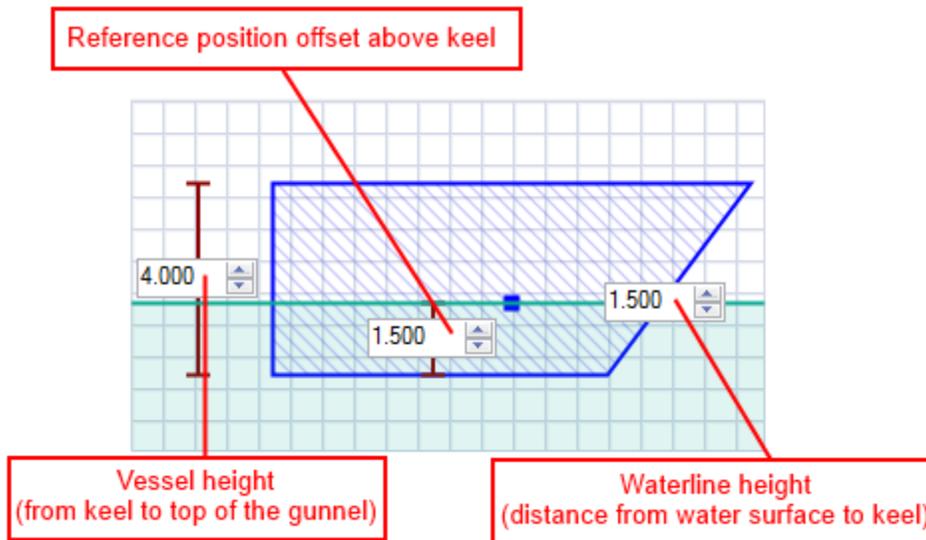


Illustration 3: Vessel profile view

Vessel physical dimensions and reference point position are entered in meters by default, but other units of measure can be selected if necessary (see 2.4).

Note that waterline height is measured when vessel is static. Additional vertical offset of the vessel moving at survey speed called **squat** can be entered under Appearance tab. Like waterline height, it is positive number.

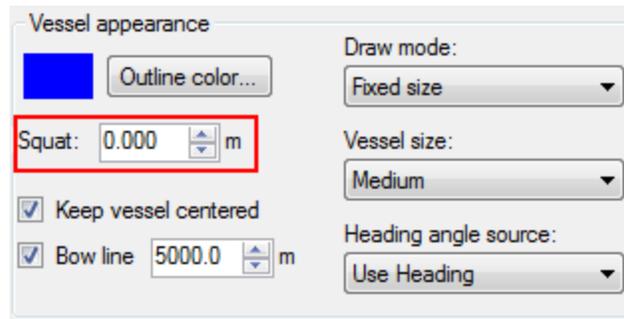


Illustration 4: Vessel appearance settings

Another notable setting in vessel appearance tab is **outline color**, which determines color of vessel contour in 2D and 3D view. All other settings can be modified in the Vessel Editor, but do not affect vessel display in 2D views or 3D view – these values are used in SonarWiz itself.

“**Keep vessel centered**” checkbox, when checked, will ensure that the vessel is always in the center of the *Map* window of SonarWiz so that the vessel does not “drive off” the screen.

“**Bow line**” checkbox, when checked, will activate projected bow line in *Map* window which is given a true scale length (entered in numeric up-down beside the checkbox) in order to assist the visualization of the ship heading.

“**Draw mode**” dropdown defines how vessel size will be interpreted in the ship graphic on the *Map* window. It may be drawn to true scale based on the dimensions entered or at fixed size regardless of scale.

“**Vessel size**” dropdown contains three predefined fixed sizes of vessel regardless of map scale (*Small*, *Medium*, or *Large*).

“**Heading angle source**” dropdown allow to choose whether to display the vessel heading base on either calculated fixto-fix *Course Made Good* or *True Heading* if that is being received by SonarWiz.

When the Vessel Editor application is started in standalone mode, new vessel with default properties is automatically created for modification. To load existing vessel to edit, use 'File → Load Vessel' or CTRL+O keyboard shortcut. The following dialog will open up:

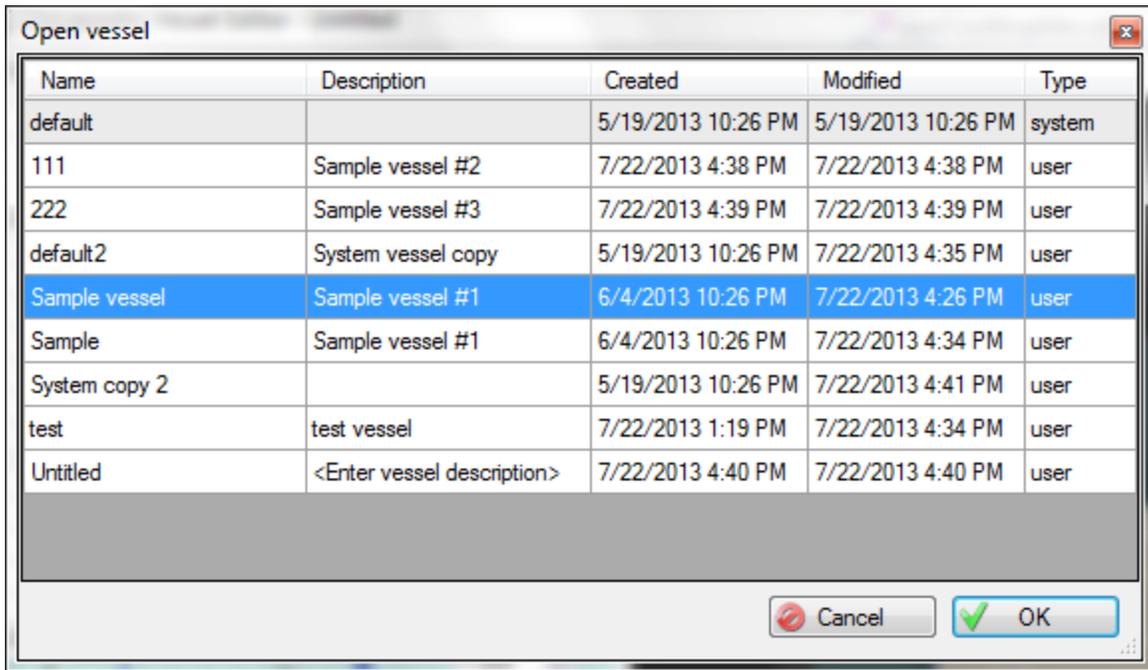


Illustration 5: "Open vessel" dialog

System-level vessels are highlighted with gray color. System-level vessels cannot be modified – all changes made to the system vessel will be saved as a new user-level vessel. To save changes to the vessel, use “File → Save Vessel” menu or CTRL+S shortcut. If a vessel file for new vessel already exists, the application will prompt to either rename the vessel, or overwrite existing one. Note that when the vessel name is changed in property manager, the vessel will be treated as new vessel.

“Help → About” menu item will show about dialog containing brief information about application:

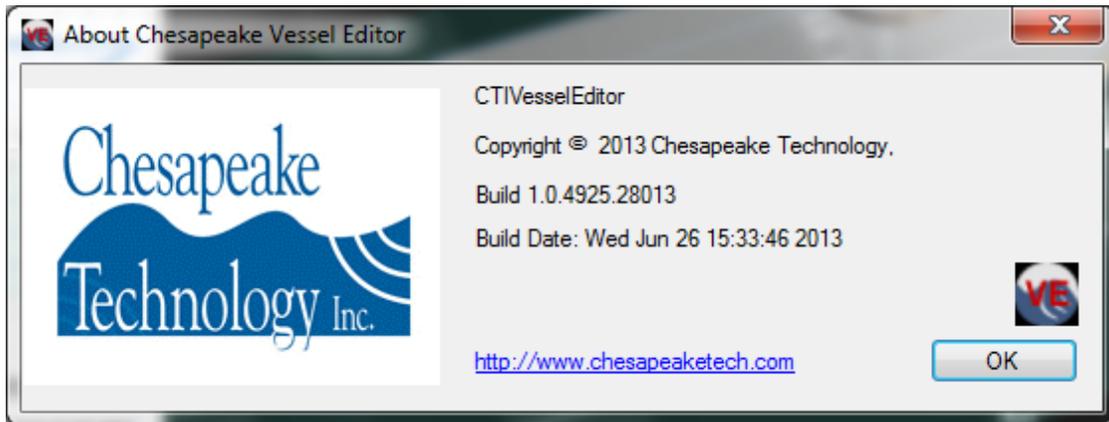


Illustration 6: "About Vessel Editor" dialog

2.2. Sensors

Sensor list is located in the lower right part of application's window:

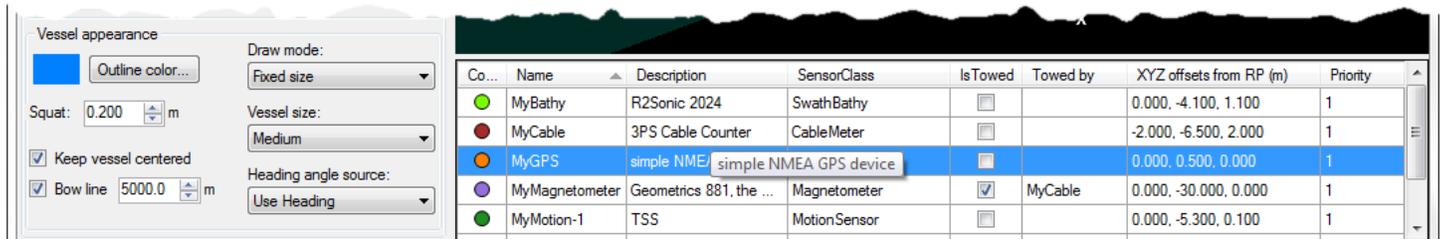


Illustration 7: Sensor list

Each sensor is marked with a colored icon (first column of the grid) matching its color in the 3D view (see 2.3). Create, update and delete operations with sensors, are available through a context menu on right mouse button click. If table header or empty list were clicked, only “New sensor...” option will be available.

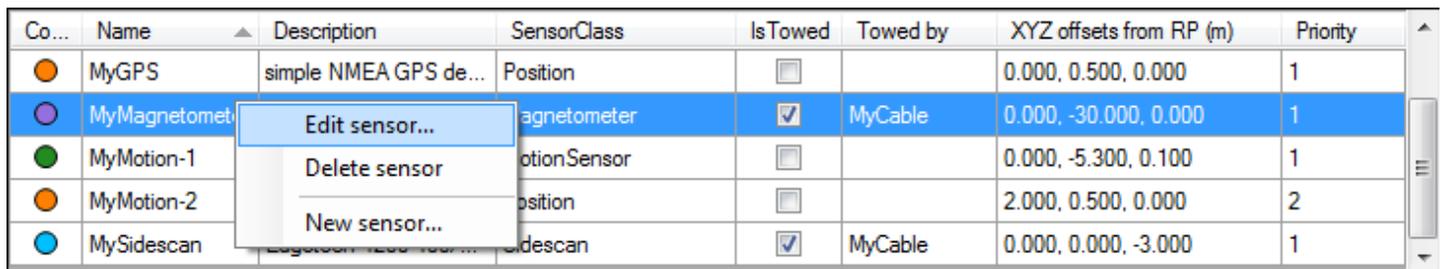


Illustration 8: Context menu in sensor list

Another way to edit an existing sensor is to double-click the corresponding row in the grid.

After “New sensor” or “Edit sensor” options have been selected, the following dialog will show up:

Illustration 9: Sensor edit dialog. Since new sensor is being created, all inputs are initialized with default values.

Sensor **name** should be unique within the scope of single vessel, and is a required field. Sensor **description** can be left empty. Available **sensor classes** are listed in Table 1. *Sidescan*, *Subbottom* and *SwathBathy* sensors are unique in the scope of vessel (but not mutually exclusive), i.e. a vessel can contain only one *Sidescan*, one *Subbottom* and one *SwathBathy* sensor. Sensor **Priority** is relative to other sensors of the same class for selection into the merge process and its values are in the range of 1 to 5. Certain sensors can be towed under-water, instead of being rigidly mounted on the vessel's hull. For this purpose, there is a special sensor class called *CableMeter*, which represents tow cables. “**Towed by**” dropdown is populated with the list of *CableMeter* sensors located on the currently open vessel. Note that *CableMeter* sensors which are already used to tow other sensors, cannot be deleted or have their class changed, until all dependent sensors have been modified to no longer be towed by the cable in question or deleted. Not all sensors can be towed (see Table 1), so the aforementioned dropdown is enabled only for sensors which can be towed. Sensor position is determined by its relative **offset** from the vessel's reference point (RP), except of towed sensors. For towed sensors, offset is taken from their respective tow cable's position instead of the reference point.

Sensor offsets from reference point or cable are entered in meters by default, but another unit of measure can be selected if necessary (see 2.4).

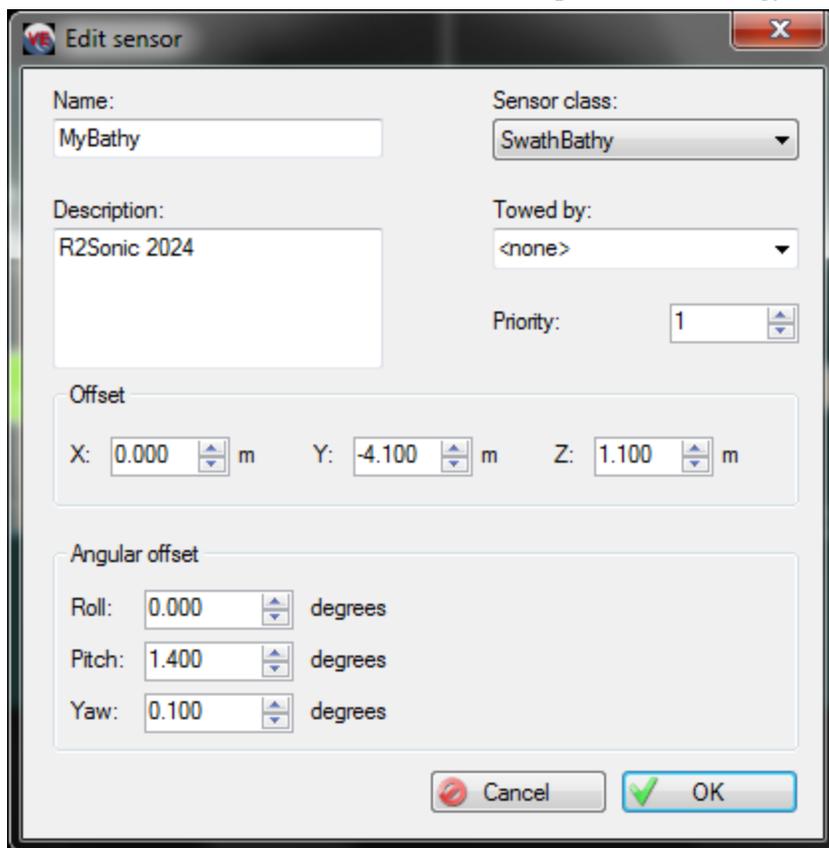


Illustration 10: Angular offsets for SwathBathy sensor

Angular offsets represent alignments (deviations) of the sensor with respect to the 3 main perpendicular X,Y, and Z axes of the vessel. These offsets can be edited only for *SwathBathy* sensors and are measured in degrees. For all other sensor classes angular offsets will always have default value of 0.

Sensor class	Instance restrictions	Can be towed
Sidescan	Only 1 permitted	Yes
Subbottom	Only 1 permitted	Yes
SwathBathy	Only 1 permitted	Yes
Position	Multiple allowed	No
Fathometer	Multiple allowed	Yes
Magnetometer	Multiple allowed	Yes
MotionSensor	Multiple allowed	Yes
CableMeter	Multiple allowed	No

Table 1: Sensor classes and their properties

2.3. 3D visualization

All changes made to vessel physical dimensions, reference position or the sensor list, are immediately applied to 3D view. Coordinate origin of vessel 3D model is always set to vessel's reference point position. Camera in 3D view can be controlled by mouse and keyboard. PageUp/PageDown keys, scrolling with mouse wheel, or dragging with middle mouse button will zoom scene out or in. Arrow keys or dragging with left mouse button will rotate vessel around X or Z axis (LEFT ARROW and RIGHT ARROW around Z axis, UP ARROW and DOWN ARROW around X axis). Vessel 3D model can be panned by dragging it with middle mouse button, or with W, Z, A, S keys to move vessel up, down, right or left accordingly.

Every time new sensor is selected in the sensor list it will be marked with an arrow in 3D view, and its shape will be put on top of everything else:

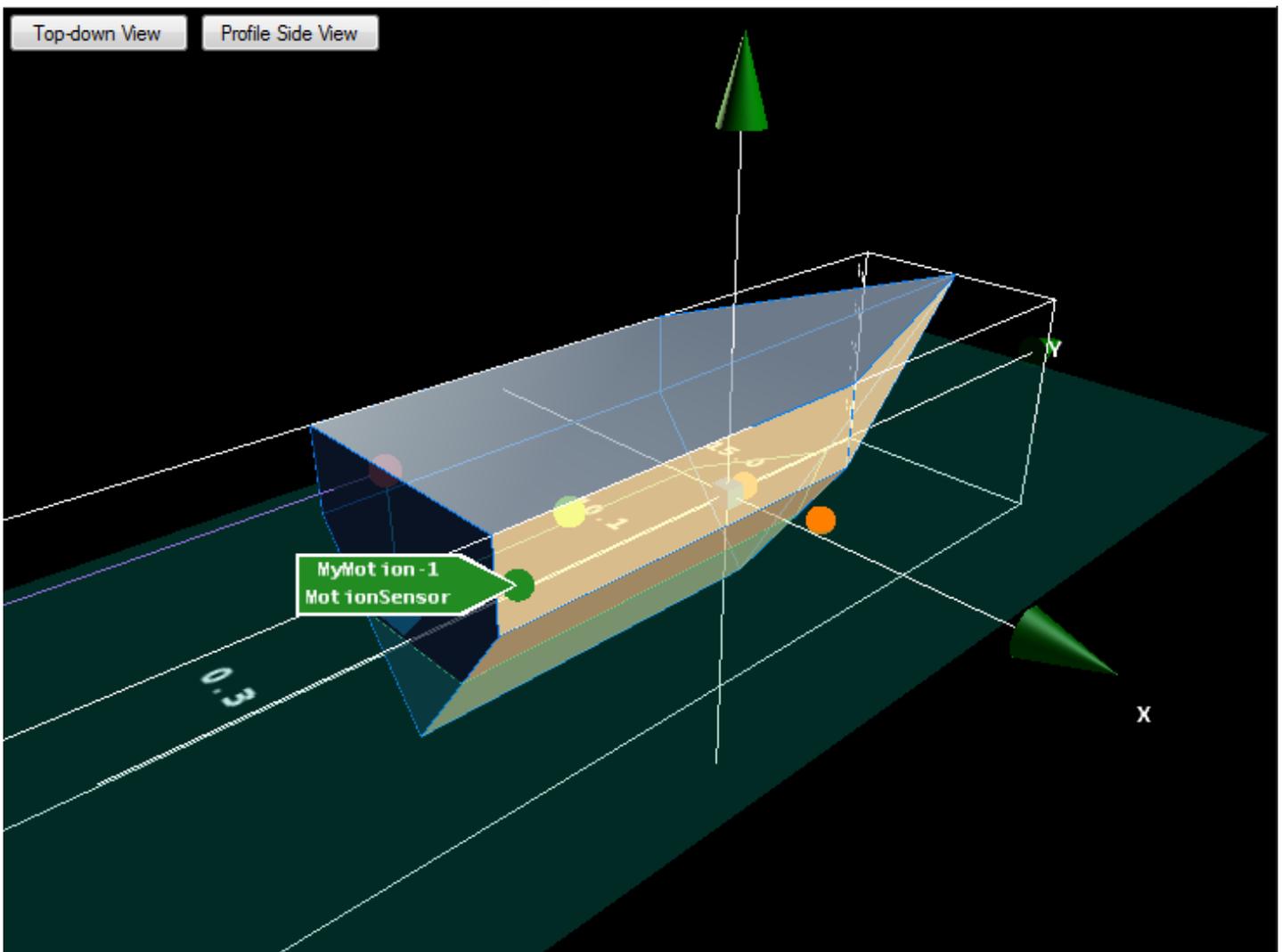


Illustration 11: Selected sensor in 3D view

Even when selected sensor is off screen, arrow will remain on screen, pointing to the approximate location of the sensor, to make it easier to pan it into view:

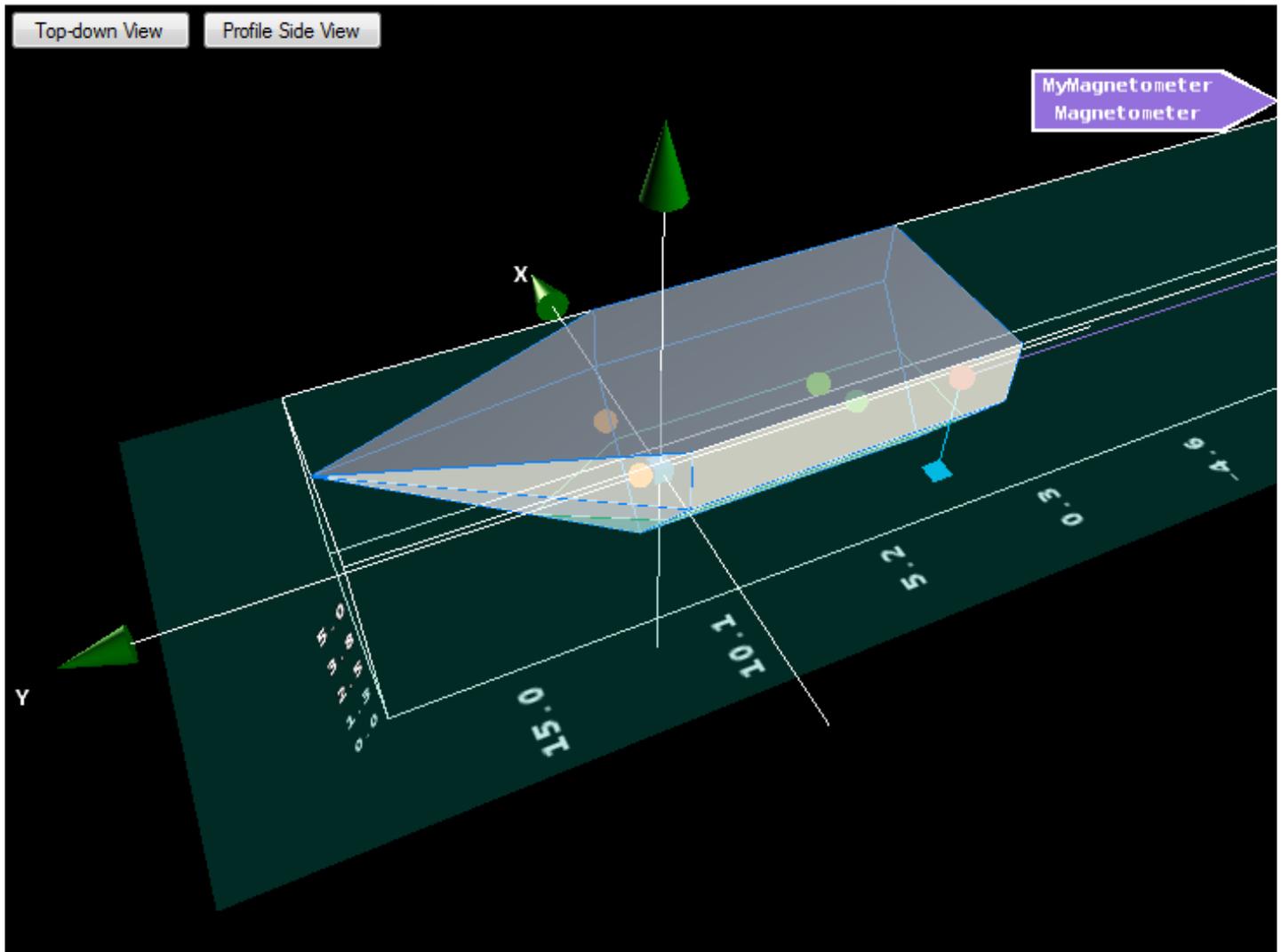


Illustration 12: Selected sensor is located off-screen

This selection can be cleared with ESC key while either 3D view or sensor list grid are focused.

There are two buttons at the top of 3D view used to set camera to display vessel in top-down plan view, or in profile view. Keyboard shortcuts ('t' for profile view and 'r' for plan view) are available for this function as well. Colors for different sensor types can be configured in Application Settings dialog (see 2.4).

Semi-transparent green surface that can be seen on screenshots represents water surface, and its color (as well as color of vessel mesh surface) can be configured via Application Settings as well. Outline color is taken from **outline color** vessel property (see 2.1).

2.4. Application settings

Application settings and graphics settings can be accessed through “Settings → Application Settings” and “Settings → Graphics” settings menu items accordingly, with F2 shortcut for graphics settings.

Application settings dialog looks like this:

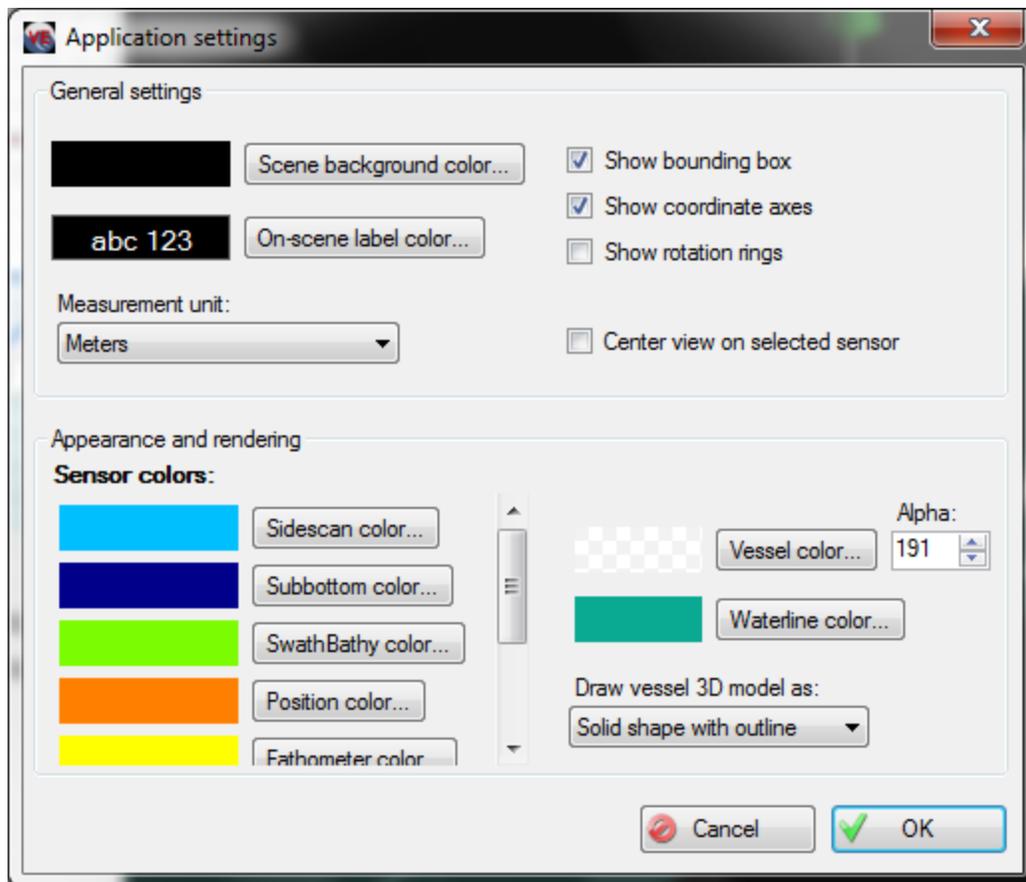


Illustration 13: Application settings dialog

It allows the user to choose background color for 3D view, color for scale division labels, the selected sensor captions and bounding box, measurement units for physical dimensions and offsets, colors for different sensor types, the colors for vessel surface and waterline, and other various vessel rendering settings. “**Show bounding box**”, “**Show coordinate axes**” and “**Show rotation rings**” checkboxes control display of the vessel's bounding box (built around vessel and its sensors including underwater ones) and scale divisions, X, Y and Z coordinate axes, and rotation indicators around X and Z axis respectively. “**On-scene label color**” setting controls color of bounding box outline, scale division labels, arrow border and label for selected sensor highlighting. “**Center view on selected sensor**” checkbox controls camera behavior on sensor selection – if checked, 3D view will be automatically centered on sensor when it is selected in the sensor list.

In the screenshot below, there is a 3D view with rotation rings enabled, and different background and text colors:

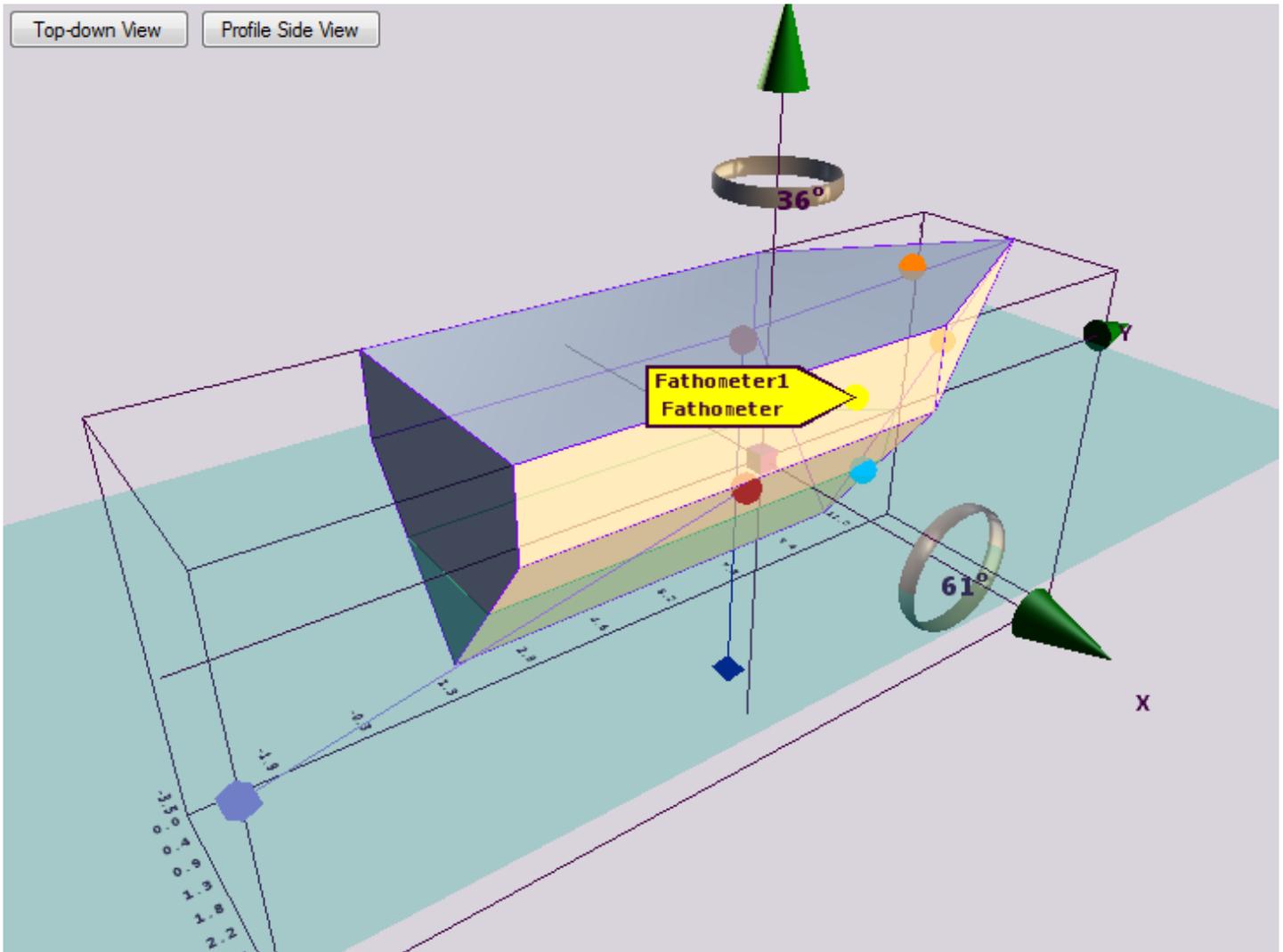


Illustration 14: Vessel 3D view with different background and text color

“**Measurement unit**” dropdown allows you to select units, to enter physical dimensions and offsets in. The dimensions can be entered in *meters*, *international feet* or *US feet*. When different units are selected, all coordinate and dimension values will be automatically translated into the new units. Default measurement units are meters.

“**Vessel color**” button allows you to select a color for the vessel surface. Default value is semitransparent white with alpha value of 191. Opaque color can be selected if desired, but it's not recommended since sensors mounted inside the vessel would not be visible, unless selected in sensor list.

“**Waterline color**” button allows the user to select color of waterline in 2D and 3D view.

In “**Sensor colors**” group colors for individual sensor classes can be selected. Both sensor shape itself

(sphere for rigidly mounted sensors and octahedron for towed sensors) and background of the arrow indicating selected sensor will be filled with color for corresponding sensor class.

By default, the vessel is drawn as a solid-color semitransparent mesh with wireframe outline, but this setting can be changed to either solid shape only, or wireframe only. In the screenshot below, the 3D view with solid shape vessel is depicted:

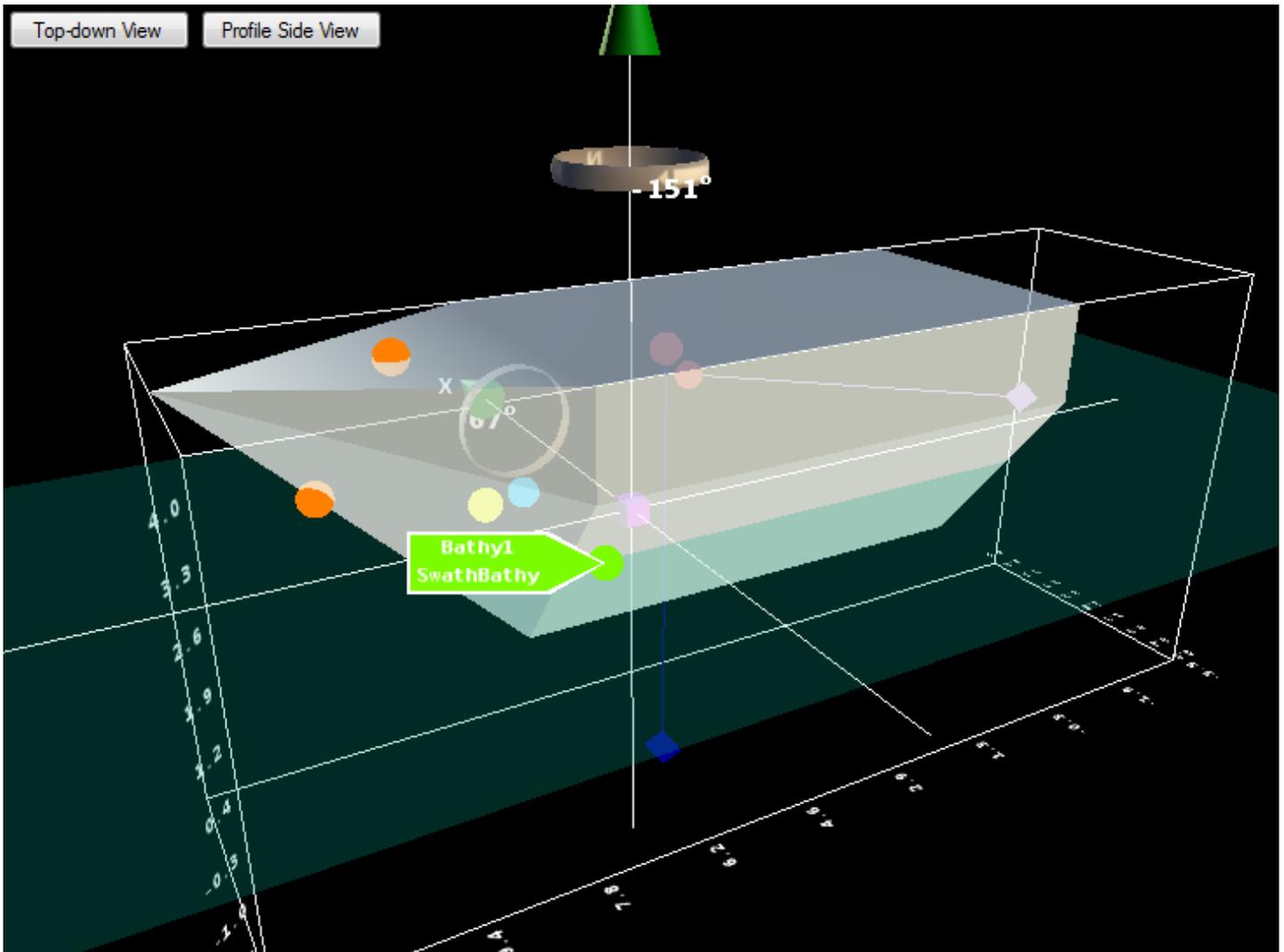


Illustration 15: Vessel drawn as solid shape

The vessel drawn as wireframe is depicted below. Note that water surface is not drawn in this mode – only waterline on the vessel's wireframe is visible.

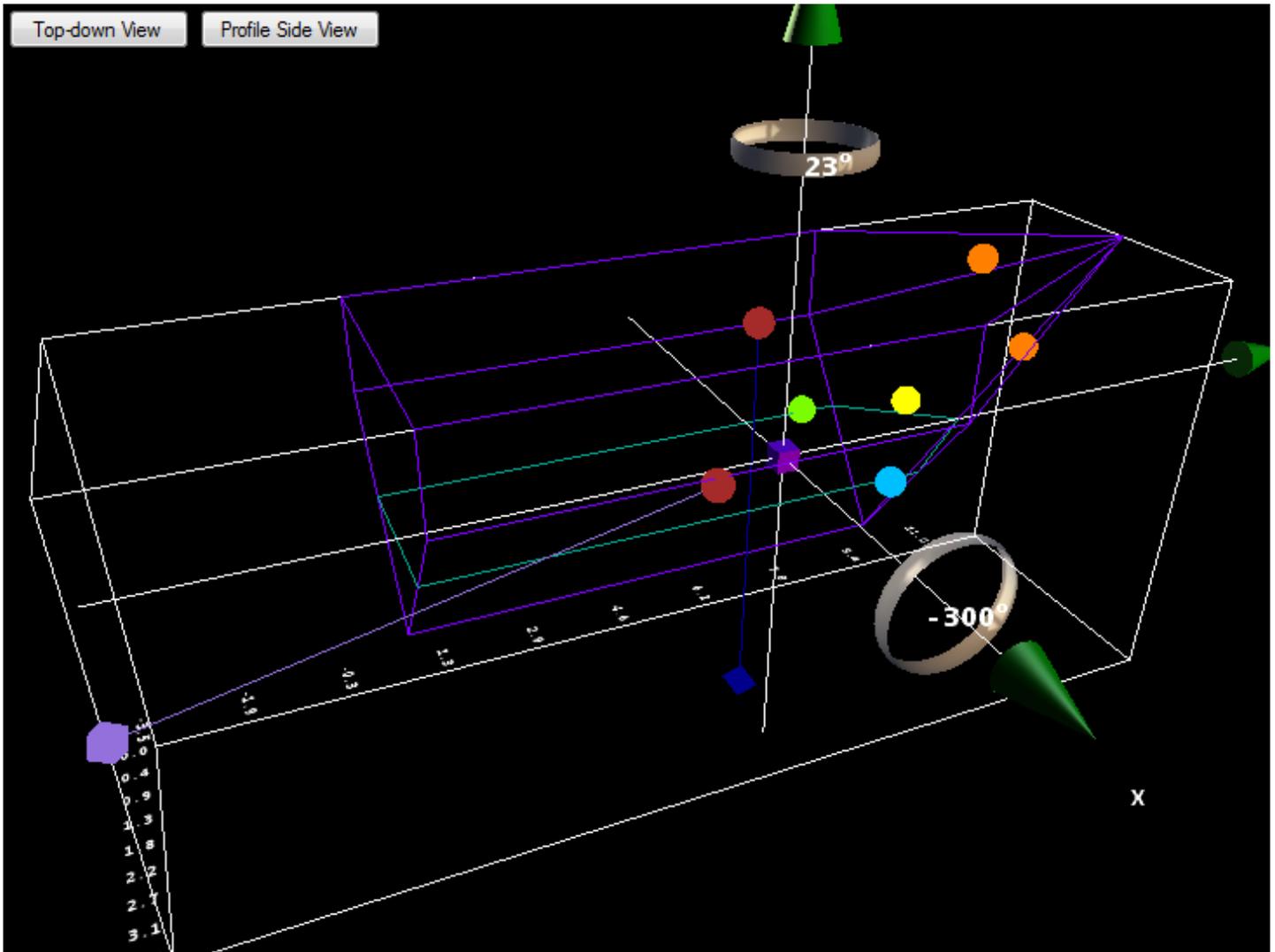


Illustration 16: Vessel drawn as wireframe outline

The graphics settings dialog allows you to set 'back buffer' and 'depth buffer' format, as well as enable or disable anti-aliasing.

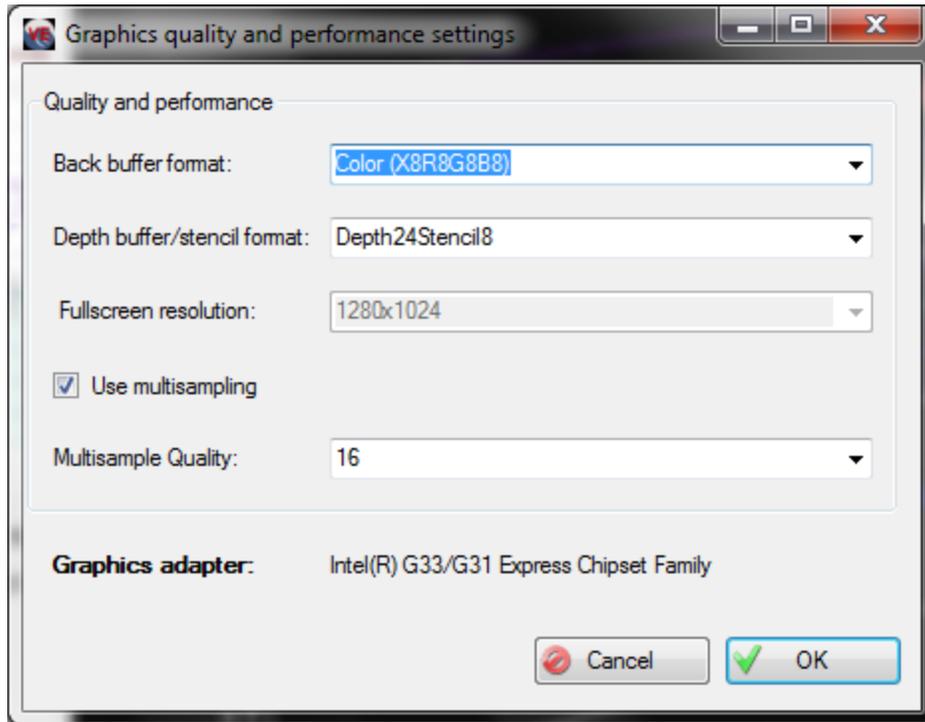


Illustration 17: Graphics settings dialog