

1. General information

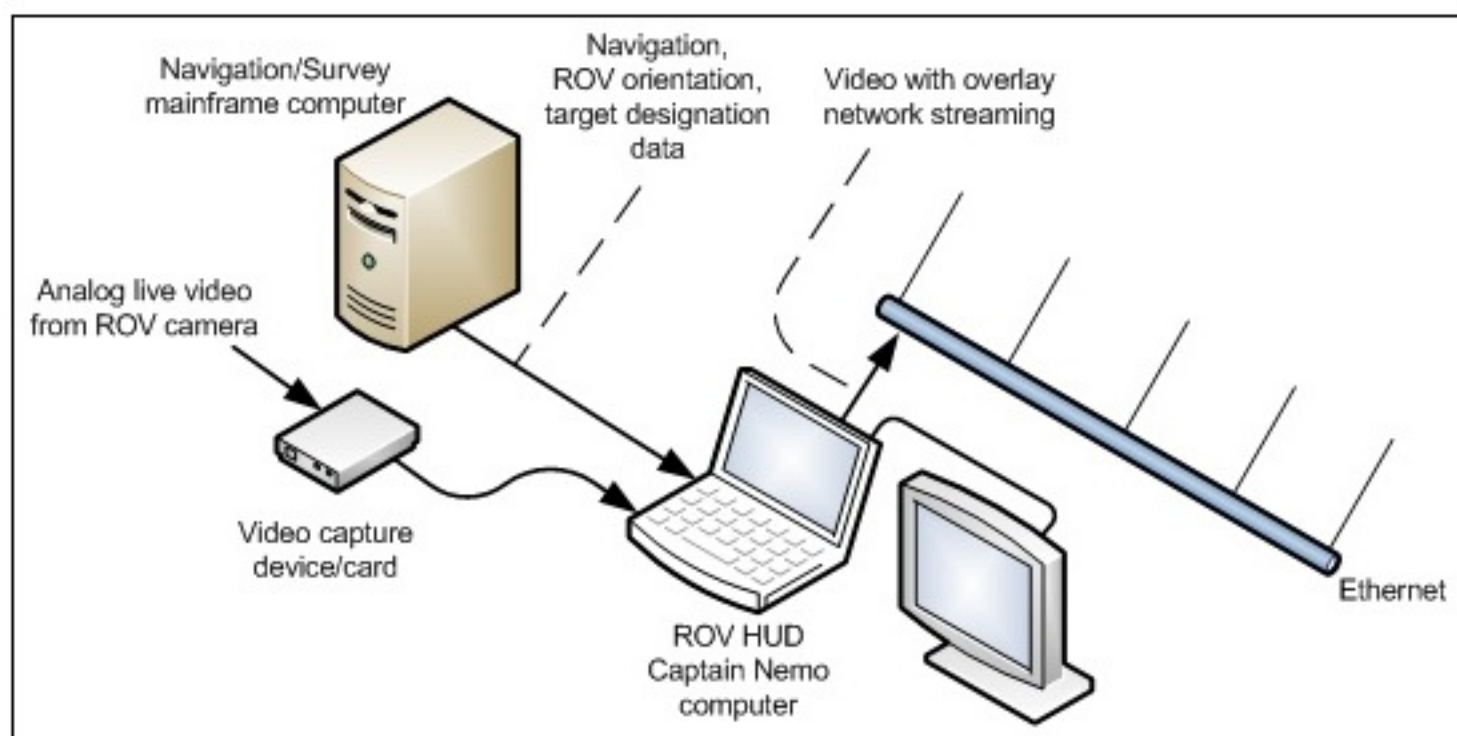
ROV HUD Captain Nemo v.1.0. is an application for visualization of the navigation, ROV orientation and targeting data on the video captured from the ROV camera. The visualized parameters are drawn from navigation systems which accumulate data from a variety of sensors connected to the navigation mainframe. Such realization scheme allows ROV pilot to have necessary information overlaid onto central (often Pan and Tilt) ROV camera live picture.

2. System requirements

- Windows 7, Windows VISTA, Windows XP, Windows MCE, Windows 2003 server, Windows 2000, Windows ME, Windows 98
- Latest DirectX version (**9.0c** or higher)
- Windows Media Encoder 9 Series

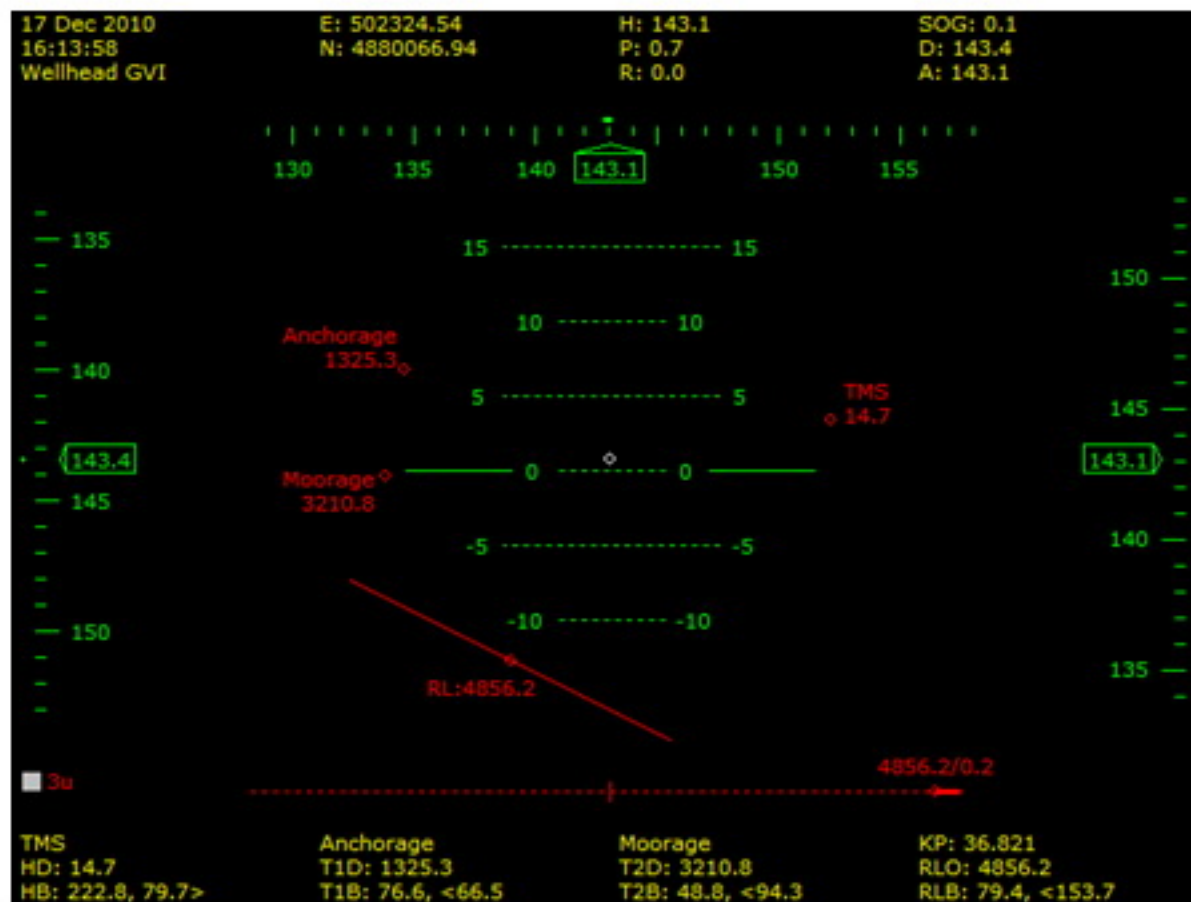
3. Description

The **Captain Nemo** application requires only two interface connections for overlay generation and overlaying on the captured video – ROV camera live video and data from the navigation mainframe. The interface scheme is shown on Pic.1.



Picture 1. The scheme of the equipment connection and signals

An overlay in the form of graphical primitive with parameters duplicated in the text overlay is the result of processing the received data. Visualization of ROV orientation parameters and targeting data provides a pilot with additional sensation of the vehicle in space and relatively to other objects. The pattern of overlay data representation and screenshots are given below (Pic. 2, Pic.3).



Picture 2. The pattern of overlay data representation in **Captain Nemo**



Picture 3. Screenshots of operating monitors

Captain Nemo v.1.0. features:

1. **Video output** captured by video capture card;
2. **WMV video recording** with file time/volume limiting;
3. **BMP or JPEG image file capture** during video previewing or video recording;
4. **Network streaming** of the overlay video;
5. **'Second monitor' function.** Full screen display of the overlay video on the 'second monitor' (if there is any);
6. **Graphical overlay:**
 - Heading indicator ("Bar" mode with heading changing gauge, "Compass" mode with reciprocal heading data);
 - Depth indicator with depth changing gauge and ground mark;

- Altitude indicator;
- Pitch and Roll indicator (relatively to horizon/vehicle with linear/'exaggerated' angle representation);
- Target marks with name and distance to target information («Home», «Target 1» and «Target 2»);
- Runline position indicator (distance to Runline and Runline orientation);
- Runline offline (helmsman) indication (ROV position relatively to Runline with offline dynamic information);
- ROV Course over ground (COG) vector indication.

7. Text overlay:

- Date, name of the project / operation;
- Easting, Northing;
- Pitch, Roll;
- Depth, Altitude;
- Speed over ground (SOG);
- Distance to targets 'Home', 'Target 1' and 'Target 2';
- Bearing to target 'Home', 'Target 1' and 'Target 2' with additional turn instructions;
- Runline information as distance and direction of the first contact
- Four fields for optional data output