Software Handbook

ProMapper

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Disclaimer

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The user understands that ProMapper produces a general, simplified, georeferenced image from a Teledyne BlueView, Inc. 2D imaging sonar. There is no stated or implied accuracy for the output coordinates or data products produced by ProMapper and the user should use the output data at their own risk.

The user understands that the quality of the geographic positioning of the sonar data displayed or output by the ProMapper software is a function of the accuracy of ancillary sensors such as, but not limited to: Sonar, GPS and Heading, and the way these ancillary sensors are installed and operated. It is the responsibility of the operator/user to ensure and understand the accuracy of any positions, measurements or data products derived from these combined systems.

License Agreement

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Warranty Information

For more information on safety and/or maintenance issues please call Teledyne BlueView, Inc. at 425-492-7400.

Chapter 1: Welcome

This manual describes the features of ProMapper from Teledyne BlueView, Inc. ProMapper is an application designed to extend the utility of the wide assortment of Teledyne BlueView 2D imaging sonars. Coupled with the new ProViewer 4 sonar interface, ProMapper allows 2D sonar imagery to be easily displayed on geo-referenced aerial photos or standard nautical charts. This real world display allows sonar operators to see the sonar data and targets in the larger context of their work area, increasing their situational awareness and the utility and value of the sonar data. The mapped images recorded by ProMapper can be used to coordinate first responders, ensure thorough and efficient searches, map bottom conditions, and a wide variety of other uses where a map view display of detailed bottom imagery is required. Additionally, the ability to "mosaic" adjacent lines into a single image allows the operator to efficiently map a large area and discern subtle bottom features with Teledyne's easily deployable forward looking sonar systems.

System Requirements

ProMapper requires a system that is running ProViewer 4 (see ProViewer 4 Software Handbook for installation and system requirements) and a Teledyne BlueView "mapping enabled" sonar. ProViewer will need to have **GPS coordinates** of the sonar pole and the **vessel heading information** coming in on serial line(s) in standard NMEA 0183 sentences. Heading and position updates of at least 2 Hz (0.5 sec) are recommended.

In addition to ProViewer 4 system requirements, ProMapper requires a system that meets or exceeds the following requirements for optimum performance.

Windows 7, 8, 8.1 (32 or 64 bit)
Core 2 Duo, i5 Core (preferred)
1GB or more of RAM
5 GB or more of free disk space
CD-ROM drive for CD installation or internet access for download
Video card requirements: ProMapper requires a PC video card which supports Open GL 2.0.

WARNING: ProMapper will **not** operate on systems using an **Intel 3000** series graphics card.

NOTE: A second monitor is helpful for displaying the mapped data.

Installation

To install ProMapper, just insert the ProMapper CD into your computer's CD-ROM drive and follow the instructions to complete the installation. You can also launch the installation by double clicking on **setup.exe** in the CD's root directory. In addition, you may download ProMapper in the software section of our website at www.blueview.com. When you start ProMapper, and you have a personal firewall enabled, you may receive a warning message saying that ProMapper is attempting to connect to the network. BlueView recommends that you select the option that will always allow ProMapper to access the network (which it needs to communicate with sonar). For example, in the image below, click **Unblock**.

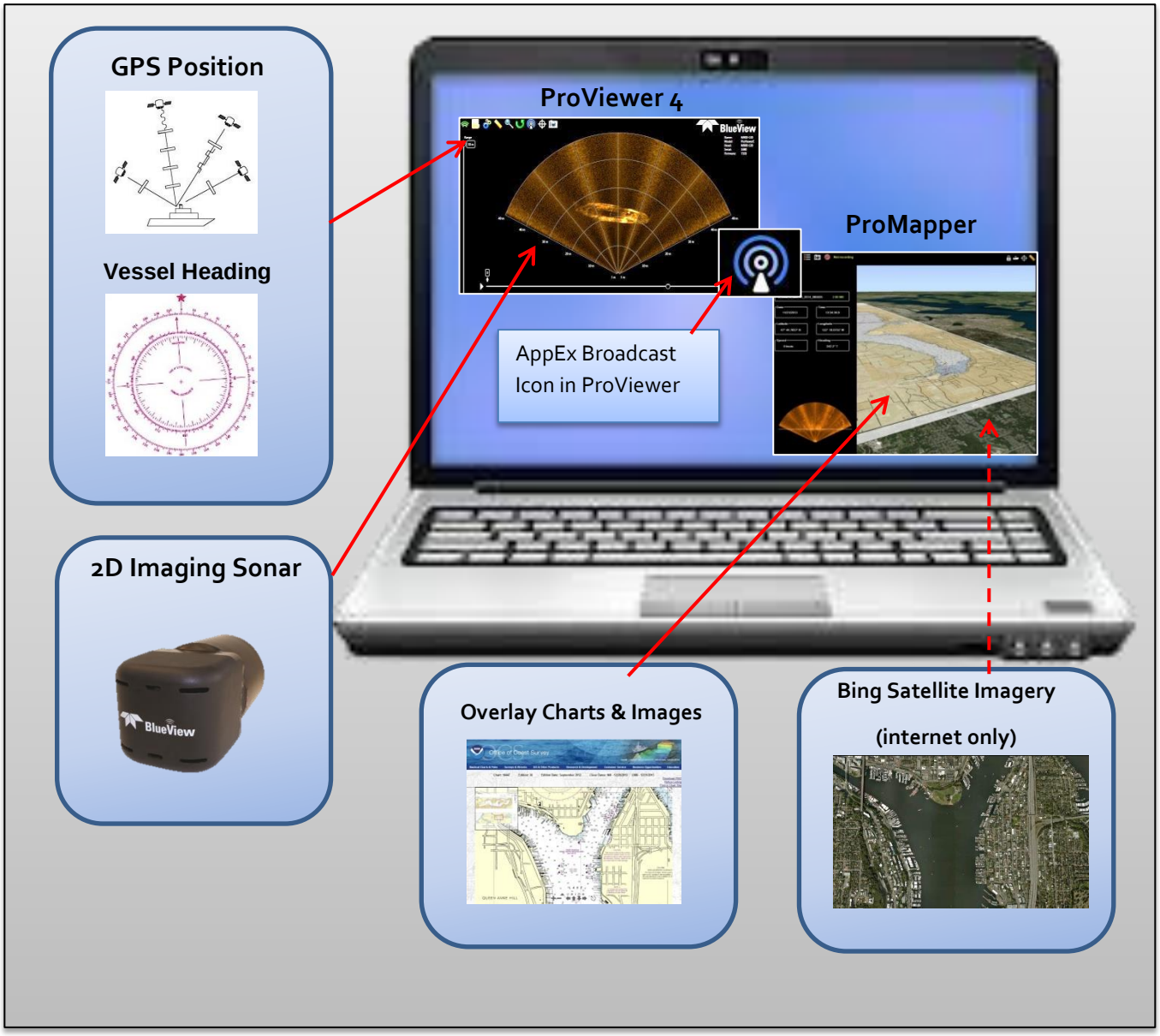
Technical Support

Teledyne BlueView, Inc. is committed to providing industry leading customer service and technical support for all of our products. For technical assistance with ProMapper or your Teledyne BlueView sonar, please email your questions to **swa_support@teledyne.com**, or contact our customer service department at **425-492-7376** between the hours of 8am and 5pm Pacific Time, or visit our website at: **http://www.blueview.com**

Chapter 2: Geo-referencing and Sonar Mosaicking

The utility of the ProMapper application is its ability to display a portion of the standard 2D data window on to a real world background image or nautical chart. This capability allows the user to easily combine the ease of use of a Teledyne BlueView forward looking sonar, with practical mapping displays to greatly increase operational efficiency. The real time map display allows the sonar operator to quickly assess coverage, sonar data relative to reference points, and interpret the data in the larger context of location and setting. In addition, because the data is displayed on screen in its true location with a graphical indication of vessel position, it is easy to reacquire targets quickly for further investigation. The next section provides a diagram of a typical setup in the field.

Standard Setup Diagram



Chapter 3: Operation Overview

Basic Operation

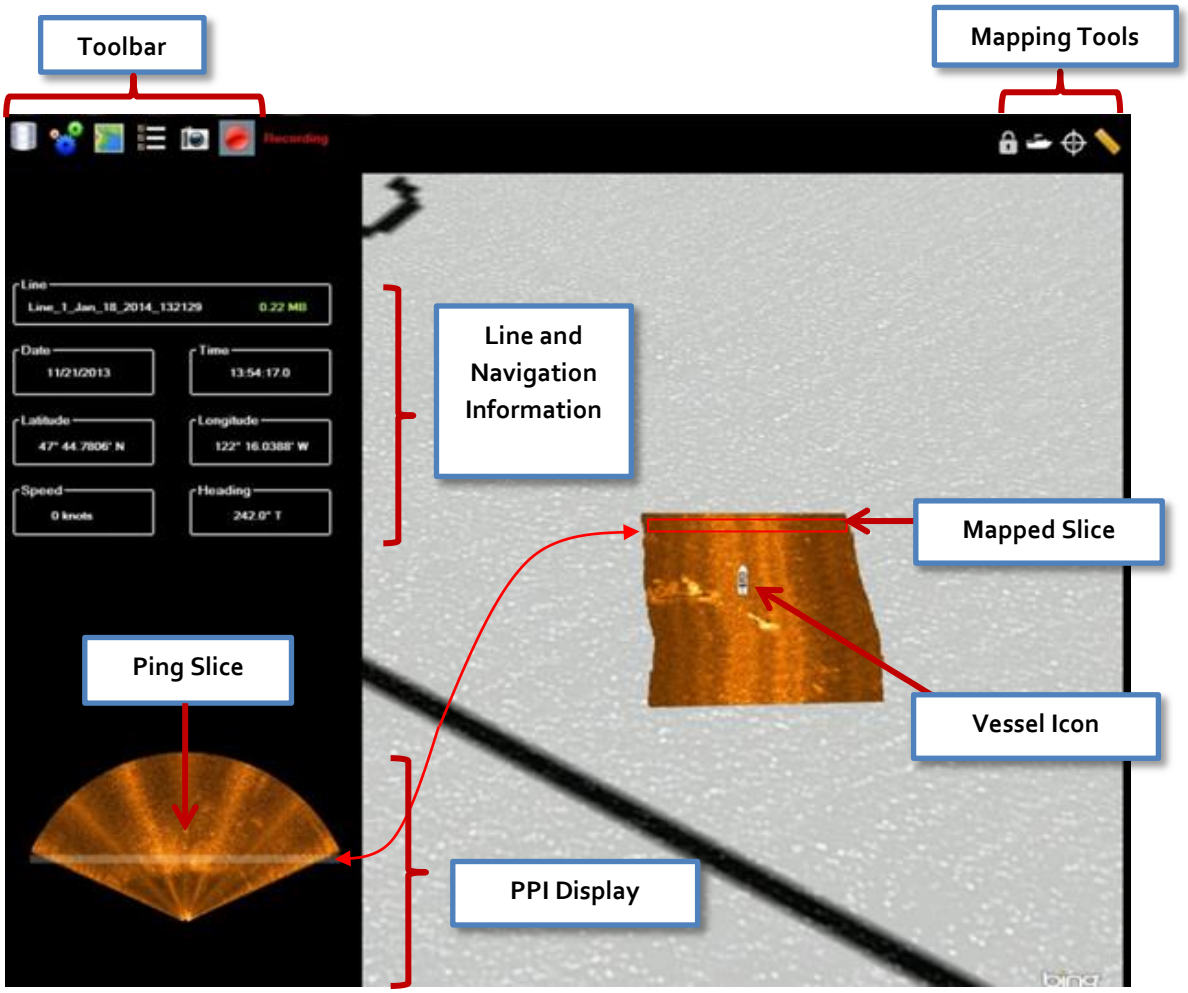
The ProMapper application works in conjunction with ProViewer 4 and a Teledyne BlueView 2D imaging sonar. Communication between this software can be established using the simple steps below:

- Open both ProViewer 4 and ProMapper.
- **Connect to Sonar:** Connect to your Teledyne BlueView imaging sonar through ProViewer. See the **ProViewer 4 Software Handbook** for more instructions on connecting to a sonar.
- **Connect to GPS and Heading sensor:** Ensure that GPS and Heading data are properly set up in ProViewer. See the **ProViewer 4 Software Handbook** for more instructions on NMEA communications.
- In ProViewer 4, set to output data by selecting the **AppEx Broadcast** Icon on the ProViewer toolbar:

  The AppEx Broadcast Icon will be animated while data is streaming.
- In ProMapper, when data is being received, live data will appear in the PPI display in the lower left of the screen. Note that ProMapper may be opened at any time and if ProViewer is not yet broadcasting, ProMapper will simply wait for this connection. See **Chapter 4** for more details.
- As multiple lines are surveyed, the geo-referenced data can be displayed in a variety of ways to produce a final composite or "mosaicked" image. Within ProMapper, the user can turn off lines, adjust the order in which lines are displayed, and adjust the transparency applied to individual lines, which allows overlapping data to shine through.
- A variety of background overlays can also be imported and used to enhance the final mosaicked image. The transparency of the overlays can also be controlled, allowing for a wide variety of background information to be displayed along with the sonar data.
- Upon completion of a survey, individual lines can be exported in GeoTiff format, which allows the sonar data to be utilized in other navigation systems or CAD type programs. Screen captures can easily be extracted from ProMapper for use in a variety of areas such as project reports or news releases.

Chapter 4: Software Basics

Typical Screenshot



General

The ProMapper screen is divided into three main display areas:

- Line and Navigation Information
- Sonar Data (PPI, plan position indicator)
- Mapping Window

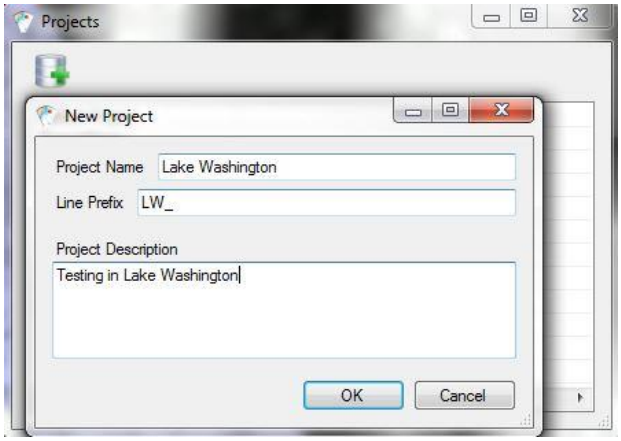
The ping slice is indicated as a shaded line over the sonar data and its location over the data is controlled by a slider which appears when the mouse is over the area. Moving the slice position up or down over the sonar data determines the area that will be geo-corrected based on vessel position, vessel heading, and sonar tilt angle. The width of the slice is controlled by a slide located in the vessel settings pull down window. In general, the narrowest slice that can be used, without displaying gaps in the mosaicked image, is best.

The PPI display and the Map display can be enlarged to full screen by double –clicking anywhere over them. Double clicking within the enlarged window returns the screen to the normal display.

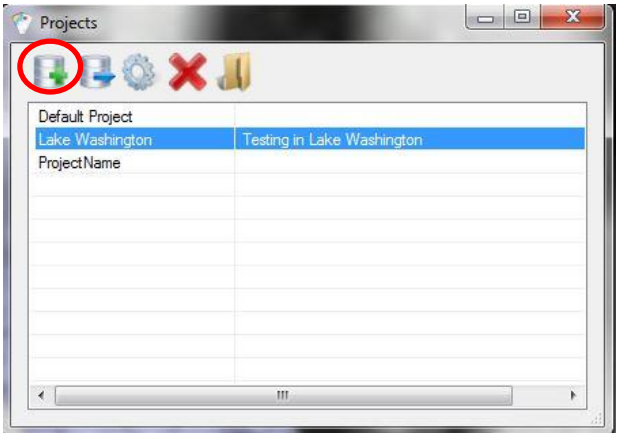
Project Setup

The project will be the location where ProMapper data is stored. All project settings such as units, overlays, etc. will be stored along with the geo-corrected files. If the ability to playback files after a survey and adjust mosaicking parameters is desired, then a **.SON** file should be saved through **ProViewer 4.**

- Project setup is initiated by selecting the Project Icon: 
- Then the new project icon: 
- Enter project information and select OK.



- Highlight project and click on the **Open Project** icon



Toolbar

The toolbar provides quick access to several commonly used functions. See the table on the following pages for descriptions of all toolbar functions.

Select Project	Access existing projects or create new projects	
Edit Project Settings	Allows access to all variables within ProMapper including: units, time base, ping slice width, project names, line prefixes, file size control, vessel icon display parameters, heading offset adjustment, sonar tilt angle and help information. For details on Project Settings, see **Chapter 5.**	
Set Background Overlays	Control creation, import and transparency of background overlays. For details on Overlays see **Chapter 6**.	
Adjust Line Display Settings	Display control of recorded lines. Toggle line display on/off, adjust display order of overlapping lines, set line transparency or delete line.	
Export	ProMapper provides an export function for exporting files of various formats. Click this button to pull up a menu of export options, including Screenshot or GeoTiff.	
Record	Toggles line recording on and off. When not recording real time data, data on the ProMapper main window is displayed in gray tone. When recording data, data is displayed in copper tone.	
Toggle Tracking Mode	When in "locked" mode the vessel icon remains centered in the mapping window and panning is not allowed. When "unlocked" the display can be moved away from the vessel while data is still being mapped.	
Cycle Preset Views	Clicking on this icons cycles the display window through four preset viewing positions: • Straight down map view • Oblique stern view • Oblique side view • Oblique bow view	

	Zooming is controlled with the scroll wheel OR by holding right mouse button down. Rotating is controlled by holding scroll wheel down. Panning, only allowed when view not locked, is controlled by holding left mouse button down.	
Toggle Cursor Information	Displays latitude and longitude of cursor position.	
Measurement	ProMapper provides a simple length measurement tool. To activate this tool, click the Measurement button on the toolbar. Next, click the location where you want to start the measurement. ProMapper then draws a yellow line between that point and displays the distance to the current pointer position. Click a second time to freeze the current measurement. A third click sets the starting point for a new measurement. Clicking on the Measurement button toggles the measurement mode on and off.	

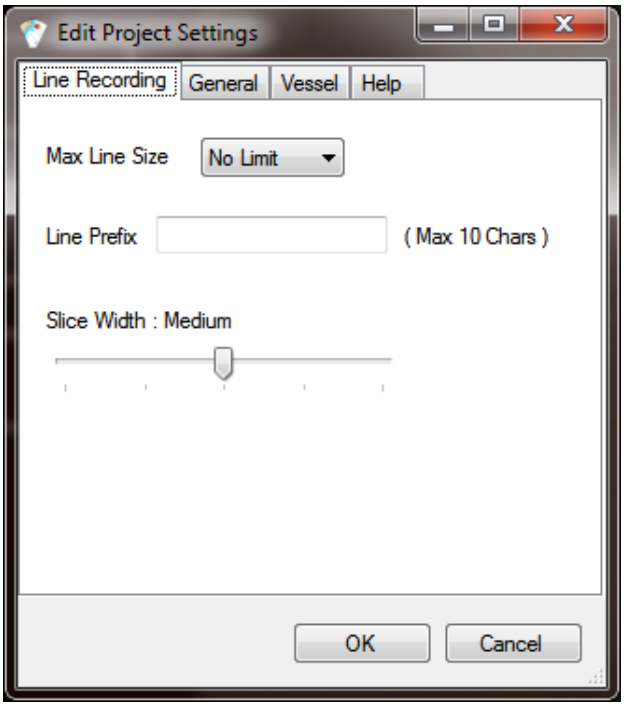
Chapter 5: Project Settings

ProMapper has a number of user-customizable settings that can be accessed through the Project Settings menu.

The following sections describe the settings menus in detail.

Line Recording

See below for descriptions of the functions in the Line Recording tab of project settings.



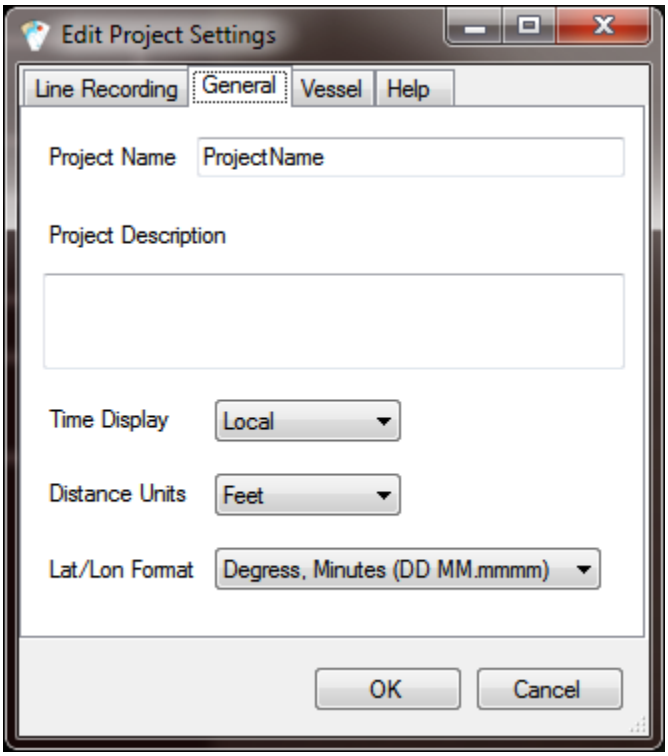
Max Line Size: Setting which allows the limitation of file size based on preference and hard drive space.

Line Prefix: Setting which allows you to specify a file prefix to make organizing multiple files easier.

Slice Width: Setting which allows for the adjustment of the slice width in the ProMapper window. This adjusts the section of sonar data cut from full sonar "wedge", which will be mapped to real world position.

General

See below for descriptions of the functions in the General tab of project settings.



Project Name: Field which allows you to specify the name of your project.

Project Description: Field which allows you to include a detailed description of your project.

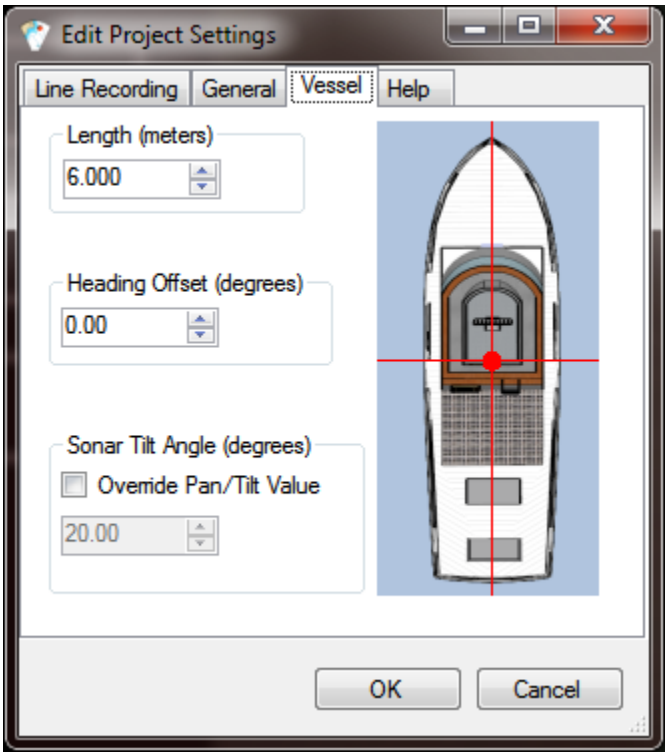
Time Display: Field which allows you to choose which time format to use, such as Local or UDT.

Distance Units: Setting which allows you to choose which system of measurements to display on the ProMapper main window.

Lat/Lon Format: Setting which allows you to choose which latitude/longitude format to display on the ProMapper main window.

Vessel

See below for descriptions of the functions in the Vessel tab of project settings.



Length (meters): Field which allows you to specify vessel length so the icon on the ProMapper main window is close to scale.

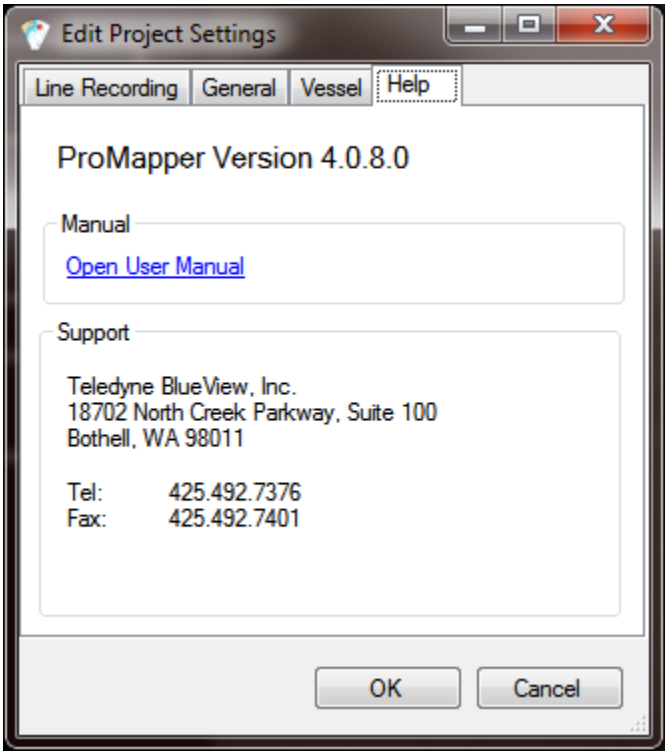
Heading Offset (degrees): Field which allows you to specify a heading offset if the heading sensor is not perfectly aligned with vessel. This can also be used to apply magnetic variation.

Sonar Tilt Angle (degrees): Field which allows you to specify inclination of the sonar toward the seafloor to improve accuracy of data slice mapping. Applicable when a pan and tilt unit is not installed, and a manually adjusted or fixed sonar mount is being utilized.

> **Note**: Double-clicking on the vessel image in this settings menu will relocate the reference point for more realistic graphic display.

Help

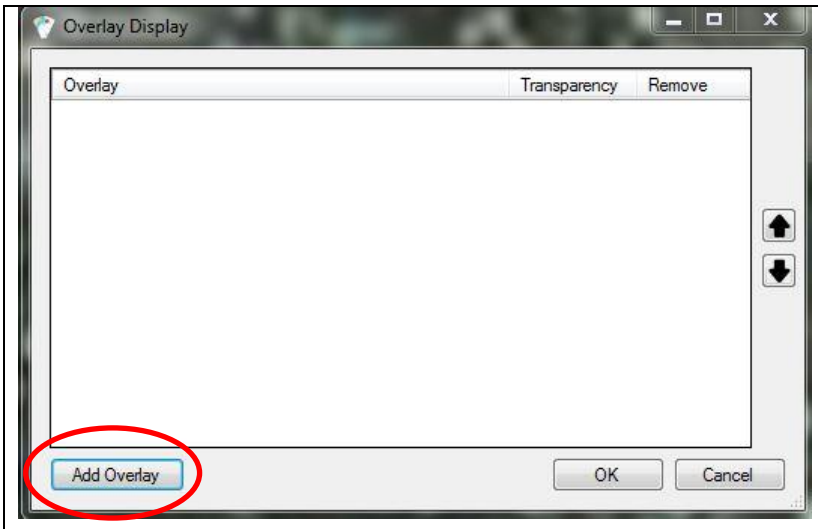
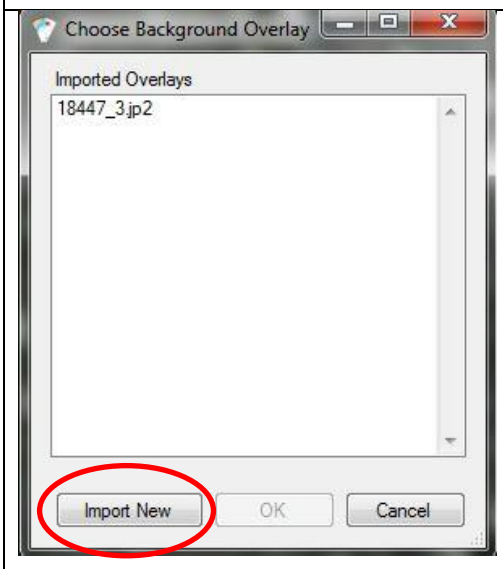
The Help tab in ProMapper settings provides access to the User's Manual, as well as version and Teledyne BlueView support/contact information.

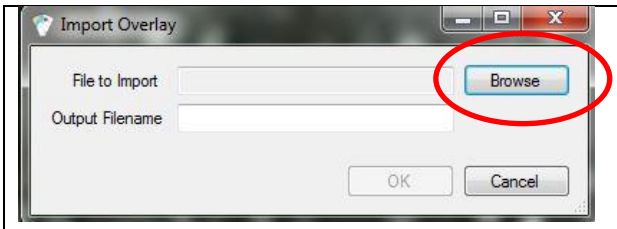


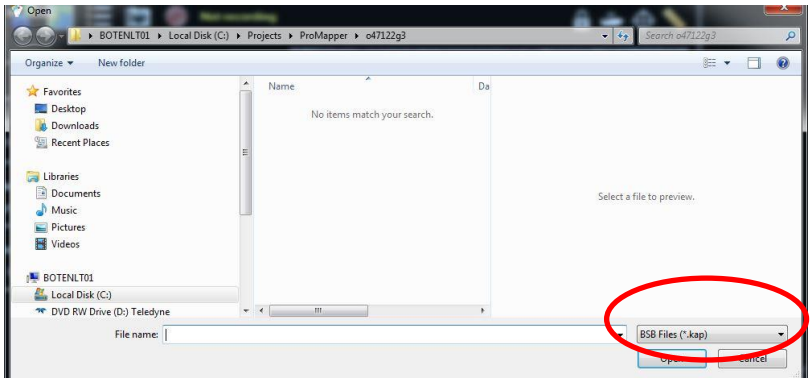
Chapter 6: Overlays

By default, ProMapper will attempt to use properly geo-located satellite imagery if an internet connection is available. In addition, ProMapper provides a number of options for overlaying displays on the main window. Using the Overlay function, background images such as geoTiffs and Nautical charts can easily be brought into ProMapper.

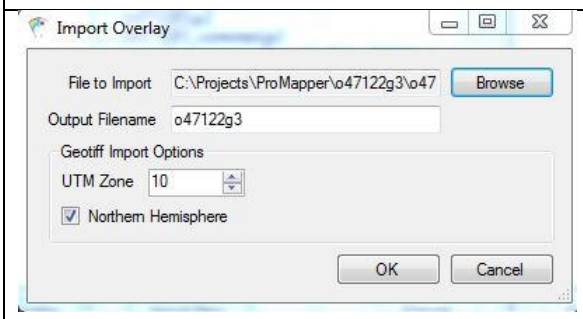
See below for instructions on adding Overlays through ProMapper:

	Click **Add Overlay** to bring up the **Choose Background Overlays** menu
	Choose from available background overlays, which have previously been imported, or click **Import New** to add an overlay. To add overlays created in another ProMapper system, the JP2 files should be placed in the overlays directory found under documents: **C:\Users*UserName*\Documents\ BlueView\ProMapper\Data\Overlays**

<table>
<tr>
<td> 


</td>
<td>Click Browse to select a file for import (BSB or GeoTiff)

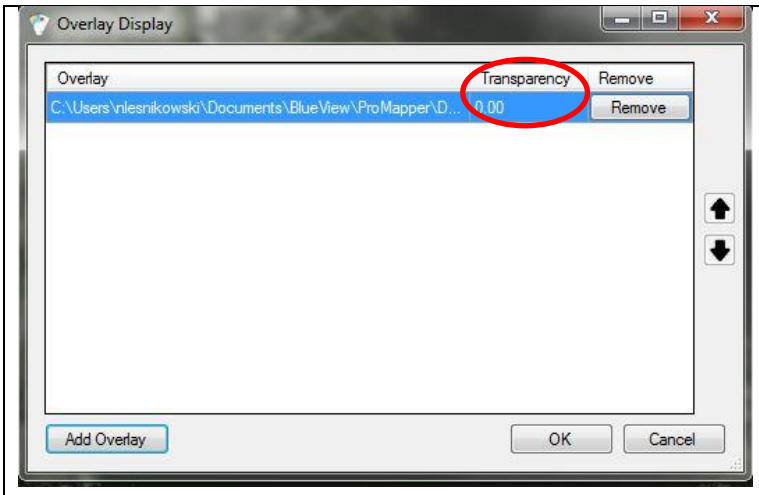
Note: the file extension for BSB files is *.KAP

GeoTiff images can be imported by selecting the *.TIF option.</td>
</tr>
<tr>
<td> 
</td>
<td>NAD83 or WGS 84 based GeoTifs can be brought in to ProMapper after selecting the *.TIF option.

If the UTM zone is known it can be entered. If the UTM zone is not known ProMapper will base the import on the UTM zone associated with the current screen view position.

Note: Overlays should be checked for proper registration prior to survey.</td>
</tr>
</table>

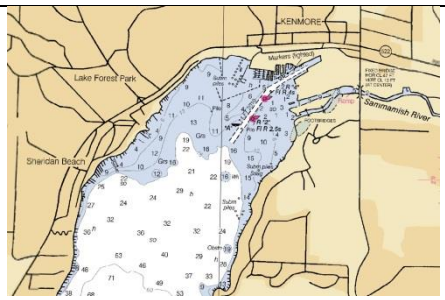
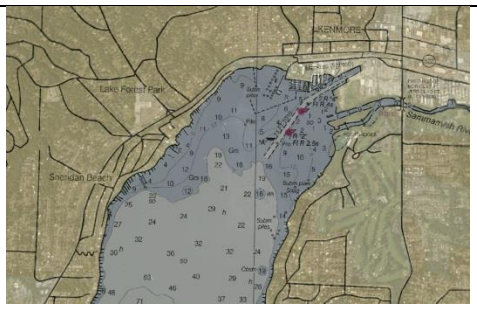
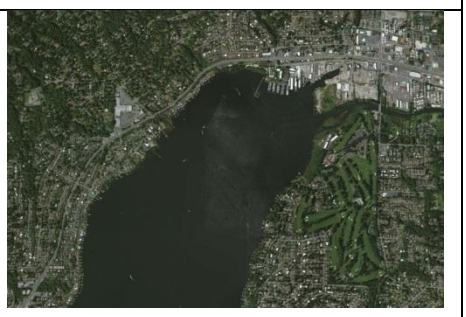
Transparency



Transperency Values:

- **0** = No transparency, only see overlay
- **0.5** = overlay 50% transparent
- **1.0** = overlay not visible, 100% transparent

Example of NOAA Chart Transparency

0.0 = None	0.5 = half	1.0 = full
		

Sources of Overlays – NOAA Charts

To download overlays from NOAA, visit http://www.charts.noaa.gov/InteractiveCatalog/nrnc.shtml

Use interactive map to locate region of interest and highlight the desired chart. Under "Available Products" click the RNC tab. The **.BSB** file holds the header information but it is the **.KAP** file that ProMapper will use as the overlay.

Appendix A: Troubleshooting

Troubleshooting Table

Below is a problem solution table for some of the common problems encountered when setting up and running ProMapper

Possible Cause	Possible Solution
No Data Being Displayed in ProMapper	Confirm ProViewer has data coming in and the AppEx Broadcast Icon has been clicked.
ProMapper not running after ProViewer paused for long period.	View AppEx Tab in ProViewer settings and wait for number of connected clients to count down to 1.
Vessel and data not being displayed in ProMapper	Make sure **Toggle Tracking Mode** icon is set to **lock**.
Overlay not being displayed in ProMapper	Make sure the overlay transparency is below **1.0.**