

WinFrog v3.5 New Features

We have made several new enhancements to WinFrog for the latest release. A summary of these new features and refinements are below:

Ray Bending Calculation for Sonardyne USBL

If a Sonardyne USBL system is being used and it is outputting the CSV Surveyor's Acoustic message, then WinFrog can use this data and the current velocity profile to model the refraction of the sound path through the water. The application of ray bending uses the velocity profile and the direction cosines and travel time from the message to compute a new X, Y, Z and reduced range to the beacon for display and eventual use in the calculation of the beacon coordinates and USBL calibration values. Although many of the effects of ray bending upon a calibration can be cancelled using the correct data collection method, correcting the data during tracking can result in more accurate results.

Harmonic Mean Velocity Calculation

The calculation of sound velocity from the velocity profile now uses the harmonic mean model described by Christian de Moustier, Lecture Notes 16, Sound Refraction in the Water Column in Clarke, de Moustier, Mayer, and Wells, Lecture Notes for Multibeam Training Course, No 26, 2001. Scripps Institute of Oceanography, pp. 2 - 4. The previous method produced the same results but the methodology was undocumented. This is now used throughout the program and is included as a separate utility as well.

Acoustic Utilities

We have added a number of utility functions related to acoustics – these can be divided into four categories:

- Calculation of the harmonic mean sound velocity given the currently loaded profile and the top and bottom depths of interest.
- Calculation of depth using entry of Digiquartz observations. Either the average density or UNESCO equations can be used to reduce the pressure value to a depth. Digiquartz coefficients can be entered either manually or obtained from a selected Digiquartz equipped COMPATT that is in the working transponder file.
- Conversion from pressure to depth using the UNESCO equation (Fofonoff and Millard) and from depth to pressure (Leroy and Parthiot). Corrections for various areas of the world can also be applied if desired.
- Calculation of sound velocity using several different methods, including Medwin, Del Grosso, Chen Millero and others. Inputs for these include temperature, salinity and either depth or pressure.

Position Averaging

Improvements to this utility include:

- The addition of a pause button – clicking this button will temporarily halt data collection. At any time the collection can be resumed or stopped and restarted. It is not necessary to wait for data collection to complete before viewing the results – this may be done any time after the collection has been paused.
- To aid in analysis of the results, a graphical plot of the scatter of the collected data, centered on the averaged position, is displayed in the editing dialog. As points are edited out or in and the results recalculated, the plot is updated.

Device Data Timeout Alarm

For devices expecting input data through a serial port, and in some cases TCP/IP, it is now possible to define a time limit after which an operator message and an audible signal are generated to notify the user that data is no longer being received through that port. The timeout period for each device can be configured individually, and once configured, enabled or disabled at any time. This last feature is useful if devices are periodically switched on or off or disconnected. This is in addition to the existing feature in which the icon corresponding to a device name in the I/O window changes from green to yellow to red depending on the amount of time since data was last received.

Automatic Attitude Device Switching

If several attitude devices are connected to WinFrog, it is now possible to allow automatic switching between the devices when the primary times out. The data item configuration dialog has been modified to allow the operator to select each attitude device as primary or secondary. If a device is selected as primary, it will automatically set all others to secondary. There is also a checkbox to enable automatic switching and a timeout edit box.

NMEA Socket Connection

It is now possible to connect the NMEA GPS, NMEA Gyro and NMEA output driver via TCP/IP sockets as well as serial ports.