Additional Outputs for Marine Magnetics SeaQuest

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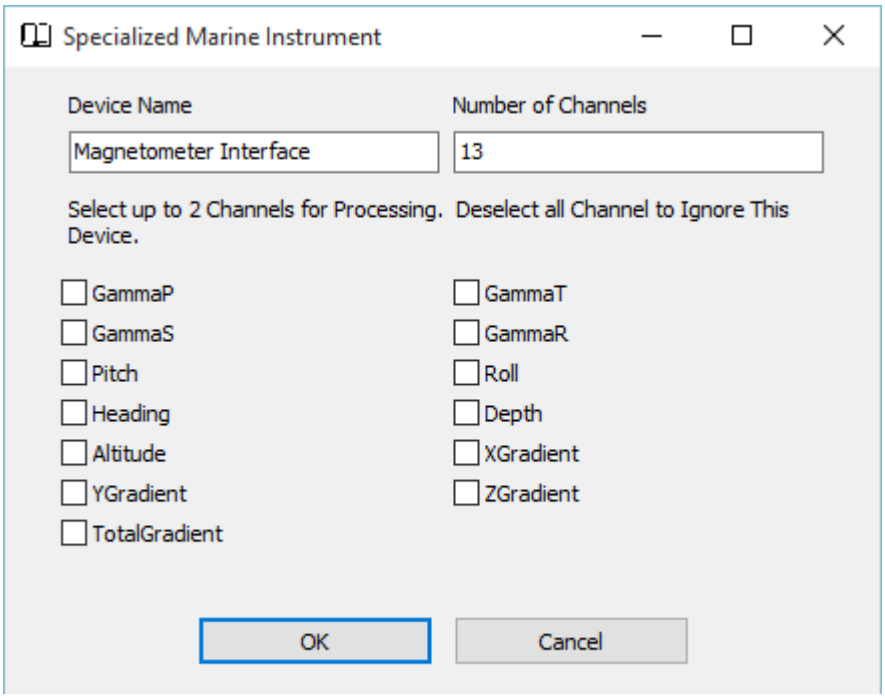
The SeaQuest device, which is part of MAGNET.dll, is being updated with several new outputs based on Marine Magnetics recommendations. These outputs are saved as SMI (Special Marine Instrument) records and include the X gradient, Y Gradient, Z gradient and the Total Gradient.

FIGURE 1. *The List of SMI Records*



Here's some of the math, keeping in mind that this is a four channel magnetometer.

Where P = Port Magnetometer Reading, S = Starboard Magnetometer Reading, V = Top Magnetometer Reading, R = Rear Magnetometer Reading.

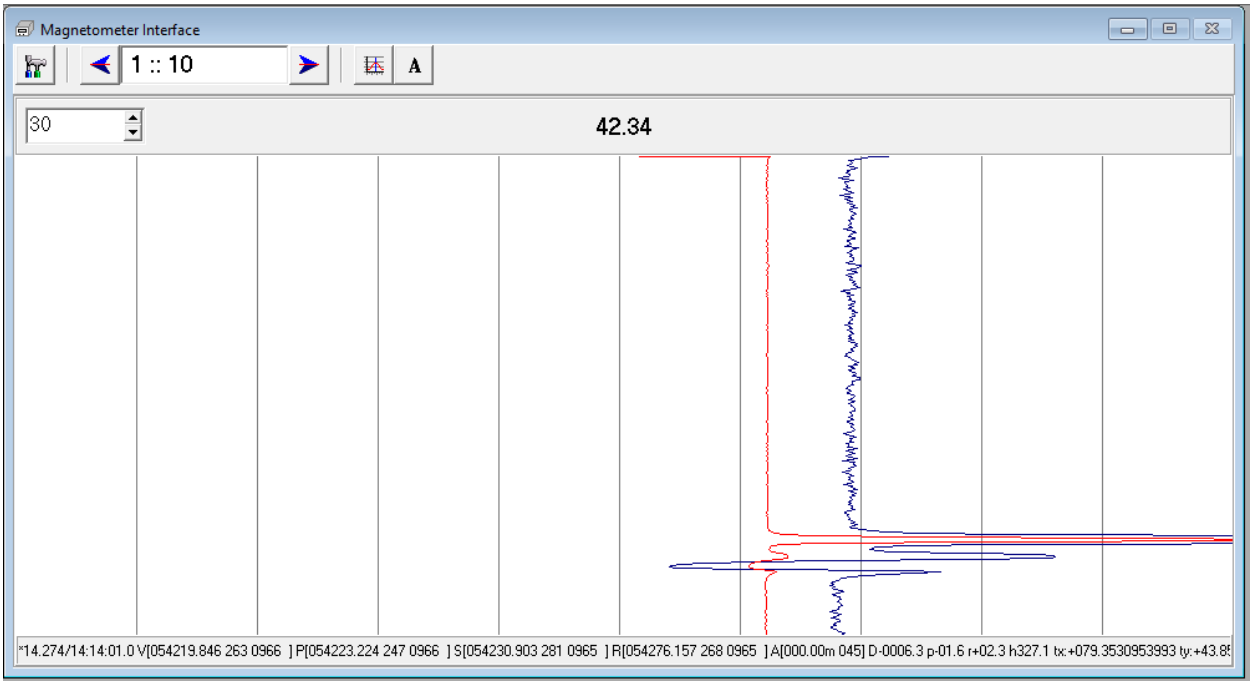
X Gradient = (P-S) / 1.5 meters **(EQ 1)**

Y Gradient = ((P + S)/2 – V) / 0.75 meters **(EQ 2)**

Z Gradient = ((P+S)/2 – R)/1.2 meters **(EQ 3)**

Total Gradient = $\sqrt{(XGradient^2 + YGradient^2 + ZGradient^2)}$ **(EQ 4)**

FIGURE 2. *Figure 2: Magnetometer Display Window*



The magnetometer interface will draw the total gradient for each ping of the device as shown in Figure 2. It is a relatively small, positive number as compared to a regular gamma reading that is generally in the tens of thousands. A total gradient reading is helpful in detecting small targets and is the primary value of interest when using the SeaQuest device. You can also place the individual readings of each magnetometer into the data display window as a way to make sure you are getting reasonable readings.

FIGURE 3. *Data Display with Four Mag Readings*