The $\text{CO}_2\text{Pro}^\text{TM}$ Sensor and Preliminary Intercomparisons


![CO2-Pro sensor image]

1) NDIR MODULE

Has the following specifications:
- Range of 0-700 ppm  Linearity < 1%
- Response time 1.6 seconds  Power drain: ~ 9 W at 12 V
- Long term stability is maintained by an automated periodic zero-point calibration (PZC) that uses a CO2 scrubbed air stream

3) LABORATORY TESTS - April 2007, equilibrated fresh water at 12 °C

![Graph showing CO2 concentration vs. year day]

5) DOGEE-SOLAS DATA - NE Atlantic, Nov-Dec 2006

![Graphs showing CO2 concentration over time]

6) OTHER DATA SETS

![Graphs showing CO2 concentration over time]

7) CONCLUSIONS

All CO2-Pro™ sensor measurements shown here were made using an earlier version prototype. The production version of the sensor is shown above in the photographs. The prototype was tested on several ships in underway-mode over several years. Based on the analysis of those data (not all of which is shown here), it appears that the sensor is capable of producing good data. More careful attention needs to be given to possible PZC ‘jumping’ effects (i.e., small offsets that occur between adjacent PZC’s of up to 1 μatm as shown in figure in Section 3). More thorough tests are needed to assess long-term stability and drift.

8) ACKNOWLEDGEMENTS

- Bryan Schofield (engineer at Pro-Oceanus) for his help with sensor design.
- Andy Lindt for discussions on the NDIR board and data processing.
- Mike DeGrandpre and Wade McGillis for collaborating on the Labrador Sea data collection.