

Acoustic Modems for Multiple Access to ADCPs

EvoLogics S2C underwater acoustic modems are providing data transfers from multiple asynchronously operating ADCP's using a single pair of modems, deployed in the West Pacific for the Northwestern Pacific Ocean Circulation and Climate Experiment. In January 2011, an Institute of Oceanology, Chinese Academy of Sciences (IOCAS) research vessel "Kexue 1" ("Science One") returned from a 52-day-cruise in the West Pacific. The IOCAS team, among other tasks, has completed installing a mooring system that carries oceanographic instruments of the Northwest Pacific Ocean Circulation and Climate Experiment (NPOCE).

Initiated by IOCAS, the NPOCE is an international cooperative program, aimed at studying the dynamics of Northwest Pacific (NWP) circulation and defining its role in moderating both regional and global climate systems. Joined by scientists from eight countries, the NPOCE program addresses the lack of in-situ observations of the NWP circulation with deployment of long-term moorings, Argo floats, conducting hydrographic surveys etc.

The instruments, moored by the IOCAS team during the recent cruise, include two ADCPs that will collect valuable data about the Mindanao Current (MC) and the Mindanao Undercurrent (MUC) at 8°N. The ADCP-buoy now floats ca. 400m below the surface, the depth on location being over 6,000m. The mooring system was designed and integrated by Laurel Technologies, a high-tech industrial company, offering products for geophysical and marine research.

EvoLogics provided the IOCAS with S2C (Sweep Spread Carrier) underwater acoustic modems as an efficient solution for retrieving the collected ADCP information. Equipped with internal data loggers, both ADCPs are connected to a single acoustic modem for uploading the data to the surface.

Saving up the space, only one S2C modem is placed on the buoy. Fitted with an energy-preserving Wake-Up Mode, the downside modem only turns itself on when detecting encoded acoustic requests from the topside modem. Both S2C modems support asynchronous data transfers with user-adjustable priorities when handling data streams from multiple sources. Once an acoustic connection is established, this key feature allows accessing each ADCP individually, initiating data retrieval or requesting status information.

IOCAS team reported successfully communicating to the ADCPs both immediately after deployment and upon return to the site 10 days after. Data, collected during the 10-day testing, was downloaded from each of the instruments. EvoLogics GmbH received positive feedback about the S2C modems' performance after the cruise was completed.

Laurel Technologies, the main dealer of EvoLogics' products in China, provided technical support for S2C modems during the IOCAS cruise.