

## Smart Hydrophones Enhance Ocean Listening

### Listening in the Ocean

Listening in the ocean requires hydrophones. Assessing sound levels requires high quality instruments that give meaningful data. Traditional hydrophones are difficult for non-technicians to set up and maintain. How do you ensure measurement accuracy when gathering sound data with a patchwork of sensors, pre-amplifiers & digitizers? How do you get the best performance from hydrophones? New users are looking for high quality hydrophone data and ease of use.

Requirements are now calling for lower noise measurements, which boosts the need for a wide dynamic range. Passive acoustic monitoring users are looking for broadband measurements that cover the whole marine acoustic monitoring range, up to 200 kHz. To make meaningful assessments, users need calibrated, low noise, broadband ocean acoustic data.

**New Users are Looking for High Quality Hydrophone Data and Ease of Use**

### Keep it Simple

Listening in the ocean can be simple and reliable using a smart hydrophone. An all-in-one instrument can be smaller and lower power. Being self-contained, it outputs calibrated data. If the smart hydrophone has its own battery, it has everything needed to operate as a logging hydrophone.

What distinguishes a Smart Hydrophone from other hydrophones is its focus on the data. Once the instrument is known to give accurate reliable waveform data, the user can focus on making decisions or assessments from the collected data. Data collected can be transformed by the instrument into the form needed by the decision maker.

**Data Collected can be Transformed by the Instrument into the Form Needed by the User**

### Example of Processing

*If we need to count porpoise clicks, have the instrument classify the clicks into weak, medium and strong. Each click is then stored in the instrument's memory along with the detect time. In addition, periodically store waveform records as a check for the detection algorithm, or store all the waveforms from detected clicks in the instrument.*



Hydrophone with Spectral Data



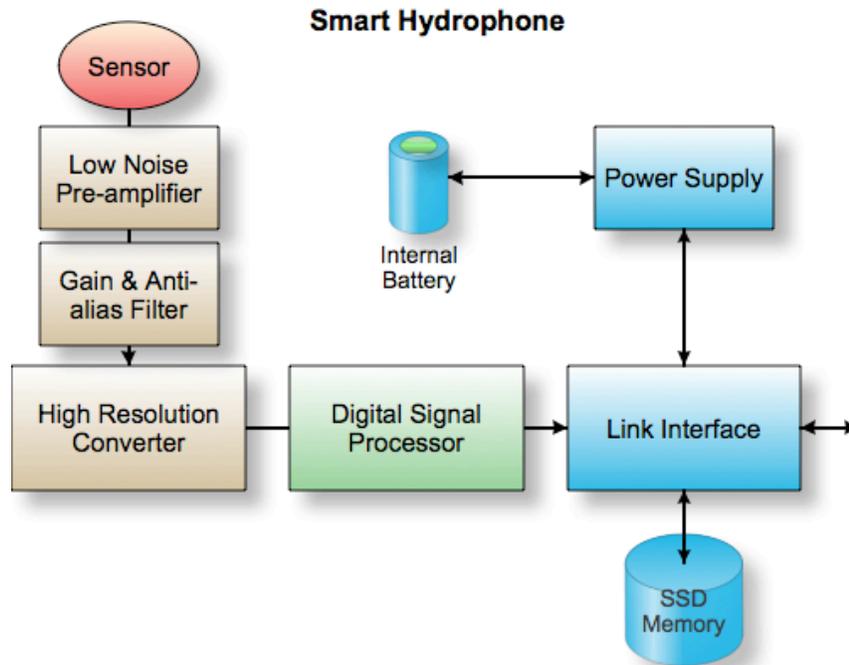
Wind Energy Production North Sea



Listen for Sea Mammals

## What's in a Smart Hydrophone?

A smart hydrophone contains the sensing element, amplifier & filter, digitizer, data link to the outside world and a power handling circuit. It also contains an accurate timebase, large memory and a powerful processor capable of performing continuous spectral analysis, octave analysis or detection algorithms.



## Timing is Everything

Streaming or recording waveform data needs high quality timing. A streaming instrument must have the ability to synchronize to a common timebase. It should also be able to timestamp streamed or stored data so that it can be interpreted clearly. For example, if a communication line is intermittent, the data host must be able to recover the timing in the stream right away.

## icListen

The icListen Smart Hydrophone is an all-in-one instrument that fits in one hand. It is designed to simplify hydrophone deployment and data collection. It is flexible enough to be used as a data logger, streaming digital hydrophone, event detector, or all three at once. Its range of data logging and acoustic processing options let the scientist or researcher settle on the best data collection arrangement that gives the right quantity of data, and decision making information.

You can learn more about Smart Hydrophones by visiting our website at [OceanSonics.com](http://OceanSonics.com).