

WIRELESS PAM DIGITAL TRANSMISSION SYSTEM

DESCRIPTION

The Seiche Wireless PAM system (W-PAM) enables transmission of full acoustic data from any marine platform in true real-time. This is necessary for effective mitigation (rather than near real-time or summary data). The system is integrated within Seiche buoys and rafts or can readily be installed on other platforms, such as Unmanned Surface Vehicles (USVs). Applications include:

- Real time mitigation of marine mammals
- Real-time monitoring of underwater sound levels

W-PAM receives signals from Seiche hydrophones, typically acquired at a sampling frequency of 500 kHz for a customised frequency range pass-band. The data stream is wirelessly transmitted to an operator located onshore or on a support vessel. Transmission causes negligible latency, packet loss or reduction in data quality. It has a range of up to 8 km, typically using 2.4 GHz/5 GHz bands. Omni-directional antennas and focussed sector antennas depending on the monitoring circumstances.

W-PAM works with the industry standard software, PAMGuard. For optimal performance, W-PAM can be further configured by one of two modes:

- RT Mode 1: full-bandwidth streaming and remote processing
- RT Mode 2: local processing and remote desktop viewing

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KEY FEATURES

The highly configurable approach of W-PAM allows the system to meet any specific constraints on power, data quality/quantity and transmission range.

System has the flexibility to integrate a range of capabilities within the unit architecture.

The W-PAM system is contained within a robust, fully waterproof unit of compact cylindrical dimensions (65 cm x 25 cm) and lightweight (< 6 kg).

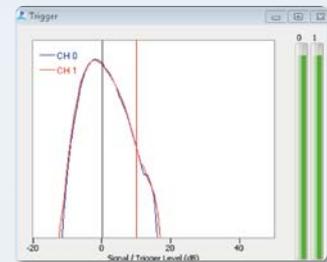
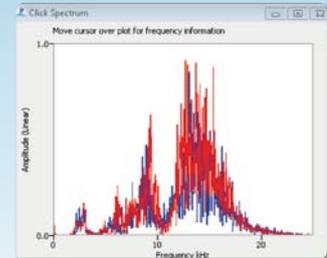
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RT MODE 1

An analogue-to-digital sampling device is installed within W-PAM on the transmitting platform (e.g. a USV) and the full-bandwidth hydrophone signals are transmitted to the receiver station (e.g. on a support vessel) for remote processing in PAMGuard. The operator views and utilises the full frequency range required for monitoring in true real-time. Sound recordings of the transmitted signal are made at the receiver station. A key advantage of RT Mode 1 is the high quality of display as data is streamed directly to the receiver station.

RT MODE 2

An electronic processing unit is installed on the transmitting platform (e.g. a USV) and the audio signal is processed locally within W-PAM using PAMGuard. The operator at the receiving station (e.g. a support vessel) has full control and viewing access to the PAMGuard user interface via a remote software link. This configuration has the advantage of lower bandwidth requirements, lower power consumption and greater transmission range. In addition, RT Mode 2 can readily be used in conjunction with DRS installed on the platform for assured data acquisition.



CASE STUDY

This collaboration with ASV for Universities of Louisiana, New Orleans and Oregon was part of a survey to assess impacts on marine mammals of the Deepwater Horizon spill of 2005. A PAM array and W-PAM system was installed aboard two USVs: C-Enduro and the C-Worker. A wireless link was established using RT2. Twenty-seven real-time detections were successfully made of dolphin species and sperm whales.